Pirate Math Equation Quest

Multi-Step Word-Problem Intervention

With Total, Difference, Change, and Equal Groups Schemas

Teacher Materials

Sarah R. Powell, Ph.D., and Katherine A. Berry, Ed.D.
The University of Texas at Austin

The Meadows Center
FOR PREVENTING EDUCATIONAL RISK

ies

Pirate Math Equation Quest

Multi-Step Word-Problem Intervention with Total, Difference, Change, and Equal Groups Schemas

TEACHER MATERIALS

Sarah R. Powell & Katherine A. Berry

This research was supported in part by Grant R324A200176 from the Institute of Education Sciences in the U.S. Department of Education to The University of Texas at Austin. Content is solely the responsibility of the authors and does not necessarily represent the official views of the U.S. Department of Education.

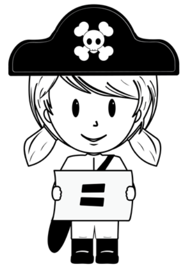
For more information, please contact:

Sarah R. Powell, Ph.D.
srpowell@utexas.edu

Katherine A. Berry, Ed.D.
kberry@austin.utexas.edu

Thank you to the fourth-grade teachers and students of Austin Independent School District who graciously participated in this research project. We also thank the many research assistants at The University of Texas at Austin for their time, effort, and dedication to the project.

Table of Contents



Introduction

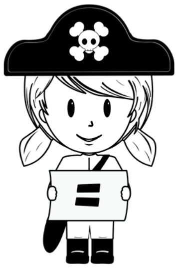
Welcome to *Pirate Math Equation Quest*!

We designed this version of *Pirate Math Equation Quest* as an individual intervention for use with students at the fourth-grade instructional level. This version of the program was developed to offer support to Tier-2 and Tier-3 students who require supplemental mathematics support with single- and multi-step word-problem solving. The focus of the *Pirate Math Equation Quest* multi-step word-problem intervention is single-digit and double-digit additive and multiplicative (single- and multi-step) word problems that include four schemas: Total, Difference, Change, and Equal Groups.

This manual includes the Teacher Lesson Guides and accompanying Supplemental Materials (i.e., posters, maps, cards, graphs, and mats) necessary to implement *Pirate Math Equation Quest* with individual students. A separate Student Manual includes the Student Lesson Packets, organized by lesson, needed to implement *Pirate Math Equation Quest*.

Scientific evaluations of *Pirate Math Equation Quest* indicated that at-risk elementary-age students (with and without mathematics disabilities) who performed in the lowest 25th percentile of their classes demonstrated improved word-problem performance with *Pirate Math Equation Quest* compared to students who did not participate in *Pirate Math Equation Quest* (Powell et. al, 2021).

Our iterations of *Pirate Math Equation Quest* rely upon the core components of *Pirate Math*, which was developed by Dr. Lynn Fuchs and colleagues at Vanderbilt University.



In This Manual

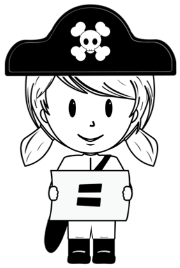
This Teacher Manual includes the following:

Introduction

- Information about implementing *Pirate Math Equation Quest*
- Schedule for implementation
- Explanation of Teacher Materials
- Explanation of Student Materials
- Explanation of Supplemental Materials
- Explanation of Other Materials

Lesson Guides 1-39

- Teacher Lesson Guides



Implementation

The *Pirate Math Equation Quest* multi-step word-problem intervention is implemented **three times** per week for **13 school weeks**. Each lesson lasts **30-35 minutes**.

During each lesson, the teacher explicitly teaches a lesson to an individual student. Each lesson includes five components: (1) Captain Cards, (2) Equation Quest, (3) Buccaneer Problems, (4) Shipshape Sorting, and (5) Jolly Roger Review. First, the student completes two trials of Captain Cards. During Lessons 1-20, the student answers as many addition and subtraction flashcards as he/she can in 1 minute. During Lessons 21-39, the student answers as many multiplication and division flashcards as he/she can in 1 minute. After 2 trials, the student graphs the higher score. Second, the student receives instruction on solving equations, the meaning of the equal sign, and the order of operations in Equation Quest. Third, the student participates in schema instruction to solve three word problems during Buccaneer Problems. Fourth, the student completes Shipshape Sorting and practices identifying word-problem schemas learned during the Buccaneer Problems during a 2-minute timing. Fifth, the student works independently to solve addition, subtraction, multiplication, and/or division fluency problems and a word problem using the schema steps.

Daily Activities

(1) Captain Cards (2-3 minutes)

- Student completes two trials of Captain Cards, each for 1 minute
- Teacher and student count cards after each timing
- Teacher monitors and provides feedback as needed, using the Counting Up strategy to assist
- After 2 trials, student graphs the higher score

(2) Equation Quest (5 minutes)

- Student receives instruction on solving equations, the meaning of the equal sign, and the order of operations

(3) Buccaneer Problems (15-18 minutes)

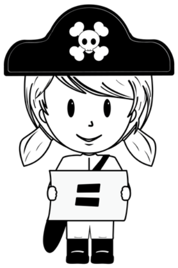
- Student participates in schema instruction to solve three word problems
- Teacher monitors and provides feedback as needed

(4) Shipshape Sorting (3-4 minutes)

- Student practices identifying word-problem schemas during a 2-minute timing
- Teacher monitors and provides feedback as needed

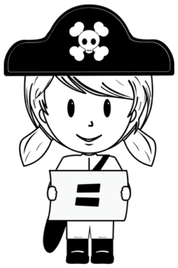
(5) Jolly Roger Review (5 minutes)

- Student independently completes addition, subtraction, multiplication, and/or division fluency problems during a 2-minute timing (top of Jolly Roger Review worksheet)
- Student independently solves a word problem using the schema steps during a 2-minute timing (botttom of Jolly Roger Review worksheet)
- Teacher provides feedback at the end of the 4 minutes
- Student colors number of earned coins/stamps during lesson on a Treasure Map



Schedule

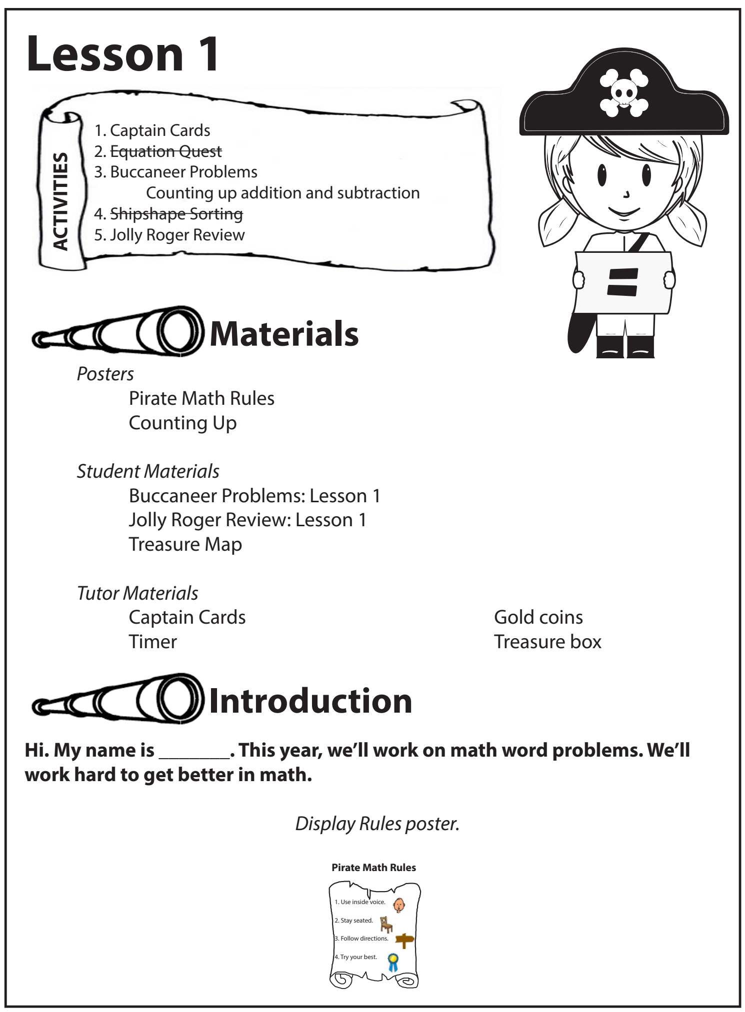
LESSON #	TEACHER LESSON
1	Counting Up Addition and Subtraction
2	Numbering charts and graphs
3	Introduce Total problems (missing total)
4	Total problems with three and four parts
5	Total problems (missing part)
6	Total problems (missing part; five parts)
7	Total problems (missing part; three parts)
8	Introduce Difference problems (missing difference)
9	Difference problems and compare sentences
10	Total and Difference problems
11	Introduce multi-step Total and Difference problems
12	Multi-step Total and Difference problems
13	Multi-step Total and Difference problems
14	Introduce Change problems (missing end)
15	Total, Difference, and Change problems
16	Change problems (missing start or change)
17	Change problems (missing start or change)
18	Change problems with three and four changes
19	Multi-step Total and Difference problems
20	Single- and multi-step problems
21	Introduce Equal Groups problems (missing product)
22	Equal Groups problems (missing product)
23	Equal Groups problems (known product)
24	Equal Groups problems (known product)
25	Equal Groups problems (missing or known product)
26	Equal Groups problems (missing or known product)
27	Introduce multi-step Total and Equal Groups problems
28	Multi-step Total and Equal Groups problems
29	Single- and multi-step problems
30	Introduce multi-step Equal Groups and Equal Groups problems
31	Multi-step Equal Groups and Equal Groups problems
32	Multi-step Equal Groups and Equal Groups problems
33	Multi-step problems
34	Multi-step problems
35	Introduce multi-step Equal Groups and Total/Difference problems
36-39	Review of all single- and multi-step problems



Teacher Materials

During each lesson, teachers uses the Lesson Guides to provide instruction to students. Each Lesson Guide is labeled as the lesson number. For example, the Lesson Guide for Lesson 1 is labeled Lesson 1. The Lesson Guides provide a step-by-step guide for teachers to follow throughout the lesson. In the Lesson Guides, teacher dialogue **is bolded** and student responses are unbolded. Teachers should review the Lesson Guides before each lesson.

To implement *Pirate Math Equation Quest* with fidelity (as conducted in the research used to validate *Pirate Math Equation Quest*), it is essential teachers teach each and every principle covered in all lessons. Some teachers study the Lesson Guides and prepare an outline; then, they use the outline to deliver the instruction in their own words. Other teachers, after studying the lesson, still rely heavily on the wording of the Lesson Guide to deliver the lesson. In either case, it is necessary to study the lesson before delivery. In all cases, teachers should deviate from the Lesson Guide to elaborate concepts and procedures if students do not seem to understand.



Lesson 1

ACTIVITIES

1. Captain Cards
2. ~~Equation Quest~~
3. Buccaneer Problems
   Counting up addition and subtraction
4. ~~Shipshape Sorting~~
5. Jolly Roger Review

Materials

Posters
Pirate Math Rules
Counting Up

Student Materials
Buccaneer Problems: Lesson 1
Jolly Roger Review: Lesson 1
Treasure Map

Tutor Materials
Captain Cards — Gold coins
Timer — Treasure box

Introduction

Hi. My name is ________. This year, we'll work on math word problems. We'll work hard to get better in math.

Display Rules poster.

Pirate Math Rules
1. Use inside voice.
2. Stay seated.
3. Follow directions.
4. Try your best.

At the top of each Lesson Guide in the scroll, the activities for the lesson are listed. Activities crossed out in the list indicate lesson components not taught in the current lesson. In Lesson 1, for example, Equation Quest is crossed out because the activity is introduced during Lesson 3. Shipshape Sorting is crossed out because the activity is introduced during Lesson 3.

Below the list of activities for each lesson is a list of posters, student materials, and tutor (teacher) materials needed for each lesson. Prior to lesson implementation, teachers should review this list to ensure strong preparation in advance of each lesson.

When teachers need to introduce a poster or worksheet, dialogue is written *in italics* with an accompanying picture. In Lesson 1, shown below, the Lesson Guide reads *Display Buccaneer Problems - Lesson 1* with a picture below to prompt teachers to introduce Buccaneer Problems. Similar instructions are *written in italics* throughout the Lesson Guides.

Help student color graph.

Every day we'll warm up our brain with these flash cards. As you get better math, your graph will get higher and higher!

You did a nice job. You earn a treasure coin!

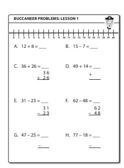
2: Equation Quest

Starts on Lesson 3.

3: Buccaneer Problems

Today, we will review by solving some addition and subtraction problems. Remember, you can always use a number line to help you count. You will se the number line at the top of the worksheet.

Display Buccaneer Problems - Lesson 1.



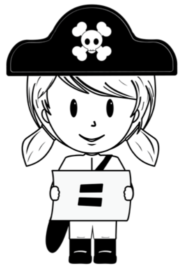
Point to A.

What sign tells us to add?

A plus sign.

That's right. A plus sign tells us to add. (Point to plus sign.) **When we add, we combine two or more numbers together.**

There are Lesson Guides for all 39 lessons in the multi-step word-problem intervention program. All of the Lesson Guides are included in this manual.



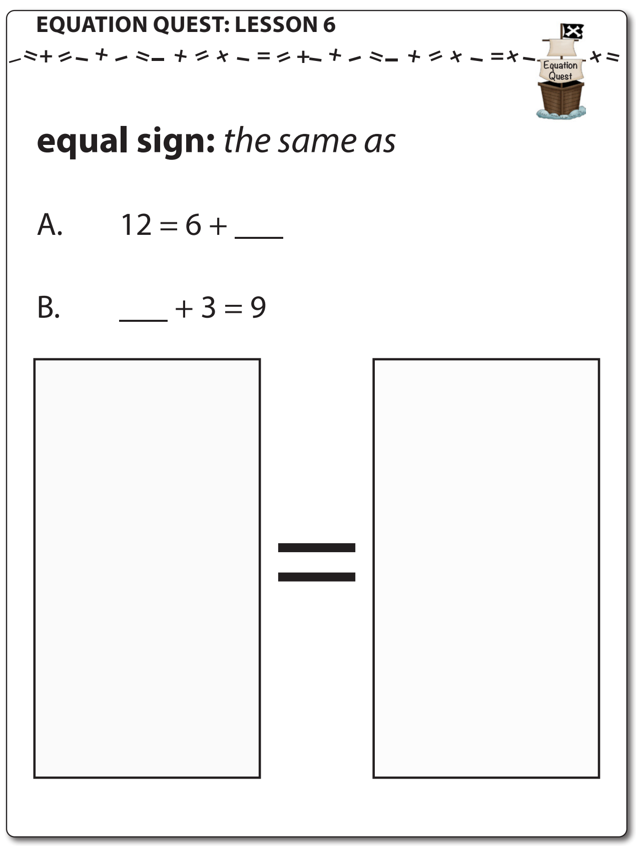
Student Materials

The Student Materials needed for each lesson are organized in a packet by lesson. For example, the Student Lesson Packet for Lesson 6 is labeled Lesson 6 Student Lesson Packet.

Student Lesson Packets include the following 4 pages:
(1) Equation Quest (beginning in Lesson 3; page 1)
(2) Buccaneer Problems (pages 2-3)
(3) Jolly Roger Review (page 4)

All Student Lesson Packets include 4 pages, so the packets can be printed for students in a set prior to the lesson. Teachers should print the Student Lesson Packets double-sided with a staple in the top left-hand corner.

Pictured below is the Equation Quest worksheet, page 1, in the Lesson 6 Student Lesson Packet.


EQUATION QUEST: LESSON 6

equal sign: *the same as*

A. $12 = 6 + \_\_\_$

B. $\_\_\_ + 3 = 9$

$=$

Note that page 1 of the Student Lesson Packets for Lesson 1 and Lesson 2 is intentionally left blank because Equation Quest is introduced during Lesson 3. The Student Lesson Packets for all 39 lessons are included in this manual.

After Equation Quest, students complete three Buccaneer Problems. Buccaneer Problems serve as a guided-practice opportunity for students to solve word problems. Teachers provide support and feedback as needed.

Page 2, the front side of the Buccaneer Problems worksheet in the Lesson 6 Student Lesson Packet, is displayed below.

BUCCANEER PROBLEMS: LESSON 6

A. Together, Dominic and Phoenix completed a 2,000 piece puzzle. If Dominic put 600 pieces together for the puzzle, how many pieces did Phoenix put together?

B. There are 230 third and fourth graders at the assembly. If there are 144 third graders, how many fourth graders are at the assembly?

Page 3, the back side of the Buccaneer Problems worksheet in the Lesson 6 Student Lesson Packet, is displayed below. Buccaneer Problems include three word problems: Problems A, B, and C.

C. Maria drew the following figures.

Figure 1

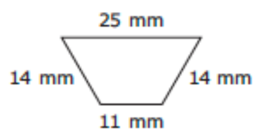


Figure 2

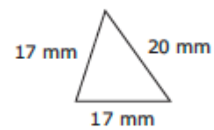


Figure 3

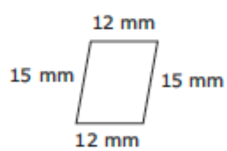
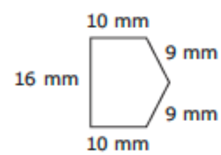


Figure 4



What is the perimeter of Figure 4?

The final worksheet in the Student Lesson Packet is the Jolly Roger Review. The Jolly Roger Review is an independent practice activity that provides students the opportunity to demonstrate their understanding of learned concepts. Below is the Jolly Roger Review worksheet, page 4, in the Lesson 6 Student Lesson Packet.

JOLLY ROGER REVIEW: LESSON 6

A. $\begin{array}{r} 489 \\ \underline{+\ 619} \end{array}$

D. $\begin{array}{r} 60 \\ \underline{-\ 49} \end{array}$

B. $\begin{array}{r} 304 \\ \underline{-\ 212} \end{array}$

E. $\begin{array}{r} 88 \\ \underline{+\ 93} \end{array}$

C. $\begin{array}{r} 64 \\ \underline{-\ 19} \end{array}$

F. $\begin{array}{r} 27 \\ \underline{+\ 92} \end{array}$

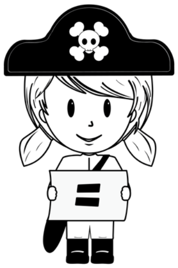
JOLLY ROGER REVIEW: LESSON 6

The table shows the cartons of milk the grocery store sold last week. On Friday and Saturday, 997 cartons were sold. How many cartons were sold on Saturday?

Milk

Day	Number of Cartons Sold
Monday	352
Tuesday	426
Wednesday	449
Thursday	373
Friday	402

Teachers score the top of the Jolly Roger Review worksheet as the number of addition, subtraction, multiplication, and/or division problems answered correctly. Teachers score the bottom of the Jolly Roger Review worksheet out of 2 points. Students earn one point for the correct number answer; students earn one point for the correct label answer. As needed, teachers provide feedback and a brief review to students.



Supplemental Materials

Pirate Math Equation Quest includes several posters for teachers to display throughout the lessons. Templates for the posters are included in this manual. In the beginning lessons, teachers should display the Pirate Math Rules and Counting Up Addition and Subtraction posters pictured on this page and the following page.

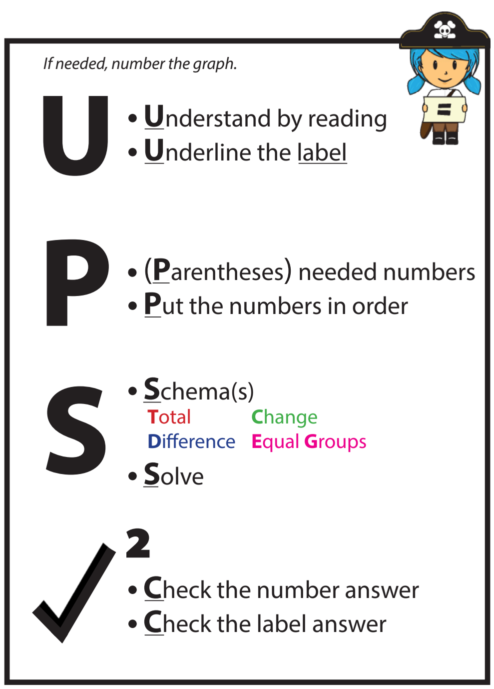
COUNTING UP
Addition

1. Put the greater number in your fist and say it.
2. Count up the number that's less on your fingers.
3. The sum is the last number you say.

COUNTING UP
Subtraction

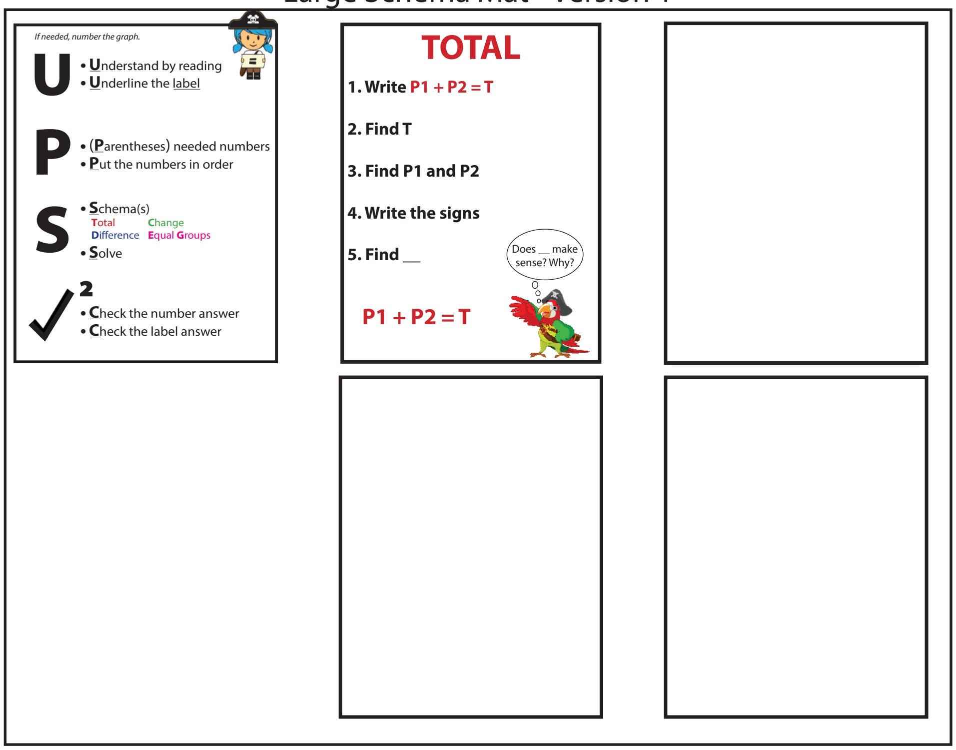
1. Put the minus number in your fist and say it.
2. Count up your fingers to the number you start with.
3. The difference is the number of fingers you have up.

As teachers introduce the four schemas, Total, Difference, Change, and Equal Groups, they need to display the UPS Check^2 poster, pictured below, and the corresponding schema posters for students to reference. The UPS Check^2 poster provides an attack strategy for students to use as they solve word problems.

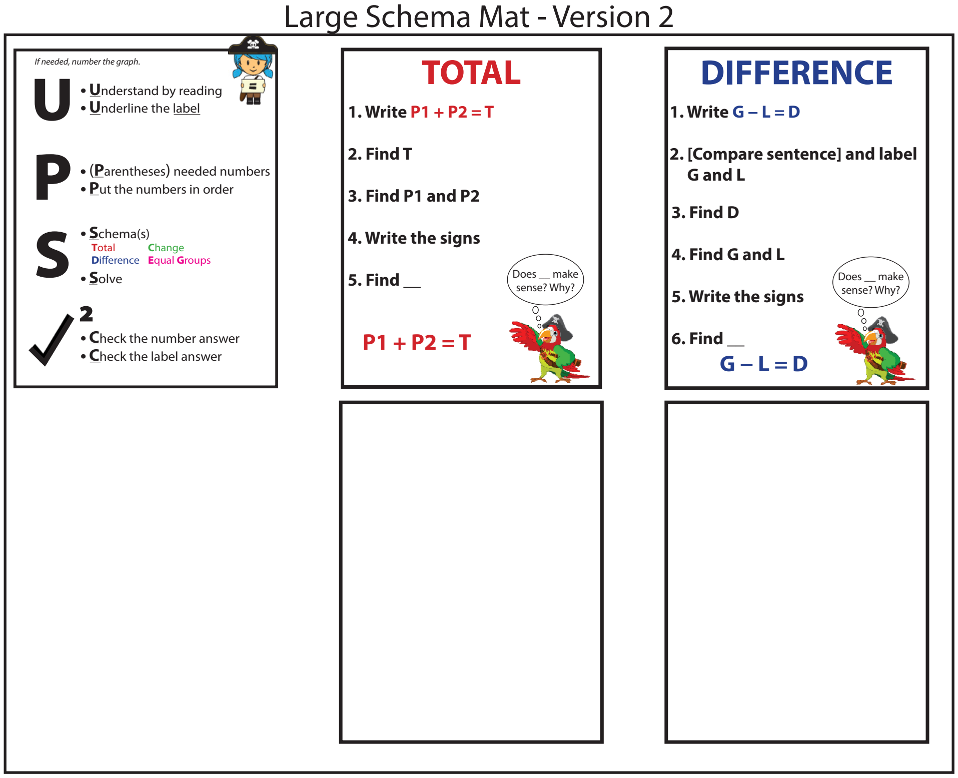


The Large Schema Mats - Versions 1-4, pictured below and on the following page, provide specific steps for setting up and solving a single-step word problem after identifying the correct schema. Total problems are introduced during Lesson 3, Difference problems are introduced during Lesson 8, Change problems are introduced during Lesson 14, and Equal Groups problems are introduced during Lesson 21. As students are exposed to new schemas, the version of the Large Schema Mat advances to reflect all of the schemas the students have learned.

Large Schema Mat - Version 1



Large Schema Mat - Version 2



Large Schema Mat - Version 3

If needed, number the graph.

U
- **U**nderstand by reading
- **U**nderline the label

P
- (**P**arentheses) needed numbers
- **P**ut the numbers in order

S
- **S**chema(s)
  Total Change
  Difference Equal Groups
- **S**olve

✓2
- **C**heck the number answer
- **C**heck the label answer

TOTAL

1. Write P1 + P2 = T
2. Find T
3. Find P1 and P2
4. Write the signs
5. Find __

Does __ make sense? Why?

P1 + P2 = T

DIFFERENCE

1. Write G – L = D
2. [Compare sentence] and label G and L
3. Find D
4. Find G and L
5. Write the signs
6. Find __

Does __ make sense? Why?

G – L = D

CHANGE

1. Write ST +/– C = E
2. Find ST
3. Find C
4. Find E
5. Write the signs
6. Find __

Does __ make sense? Why?

ST +/– C = E

Large Schema Mat - Version 4

If needed, number the graph.

U
- **U**nderstand by reading
- **U**nderline the label

P
- (**P**arentheses) needed numbers
- **P**ut the numbers in order

S
- **S**chema(s)
  Total Change
  Difference Equal Groups
- **S**olve

✓2
- **C**heck the number answer
- **C**heck the label answer

TOTAL

1. Write P1 + P2 = T
2. Find T
3. Find P1 and P2
4. Write the signs
5. Find __

Does __ make sense? Why?

P1 + P2 = T

DIFFERENCE

1. Write G – L = D
2. [Compare sentence] and label G and L
3. Find D
4. Find G and L
5. Write the signs
6. Find __

Does __ make sense? Why?

G – L = D

CHANGE

1. Write ST +/– C = E
2. Find ST
3. Find C
4. Find E
5. Write the signs
6. Find __

Does __ make sense? Why?

ST +/– C = E

EQUAL GROUPS

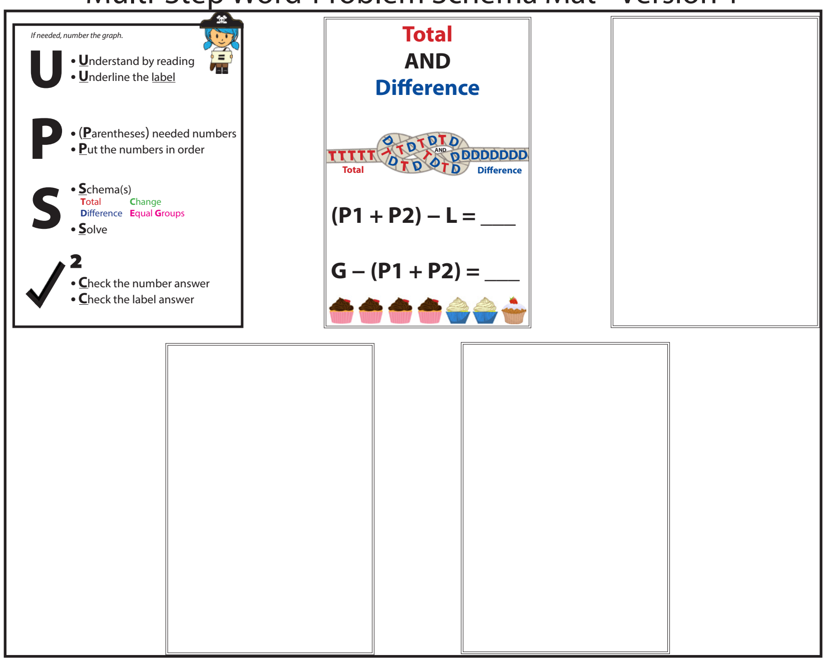
1. Write GR × N = P
2. Find P
3. Find GR and N
4. Write the signs
5. Find __

Does __ make sense? Why?

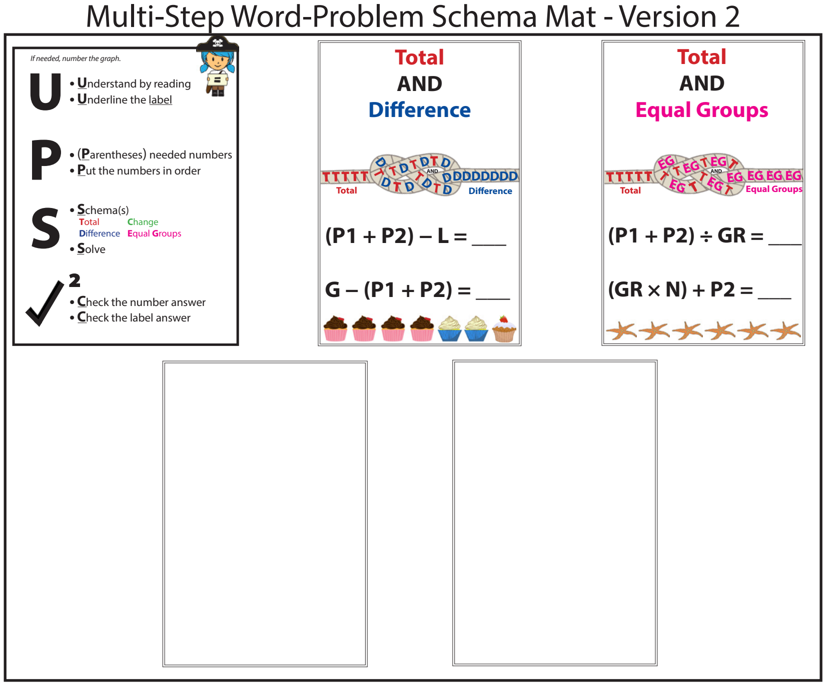
GR × N = P

In addition to the Large Schema Mats - Versions 1-4 (which are used for the single-step word problems), the curriculum includes Multi-Step Word-Problem Schema Mats - Versions 1-4, pictured below and on the following page, that provide specific steps for setting up and solving a multi-step word problem after identifying the correct schemas. Total and Difference multi-step word problems are introduced during Lesson 11, Total and Equal Groups multi-step word problems are introduced during Lesson 27, Equal Groups and Equal Groups multi-step word problems are introduced during Lesson 30, and Equal Groups and Total/Difference multi-step word problems are introduced during Lesson 35. As students are exposed to new multi-step schema combinations, the version of the Multi-Step Word-Problem Schema Mat advances to reflect all of the multi-step schema combinations the students have learned.

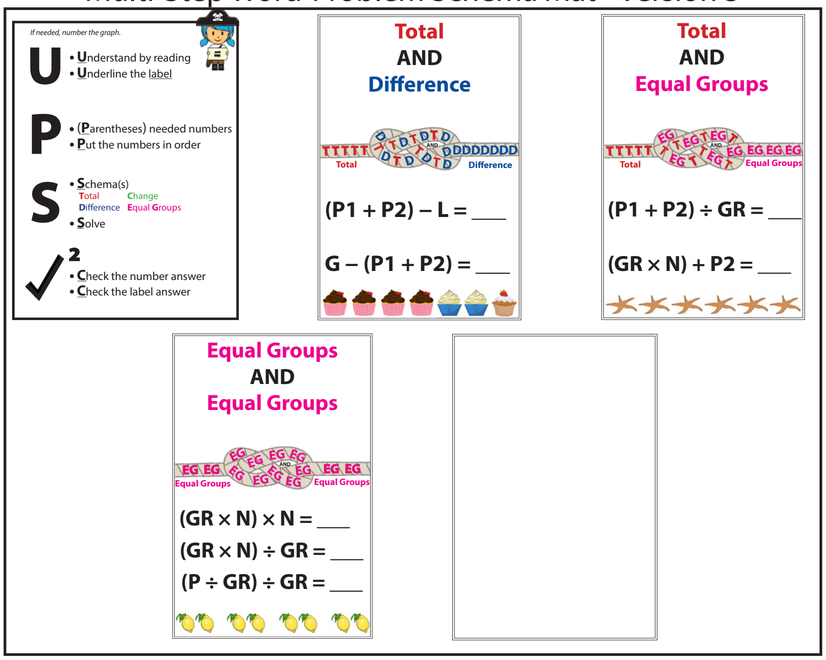
Multi-Step Word-Problem Schema Mat - Version 1



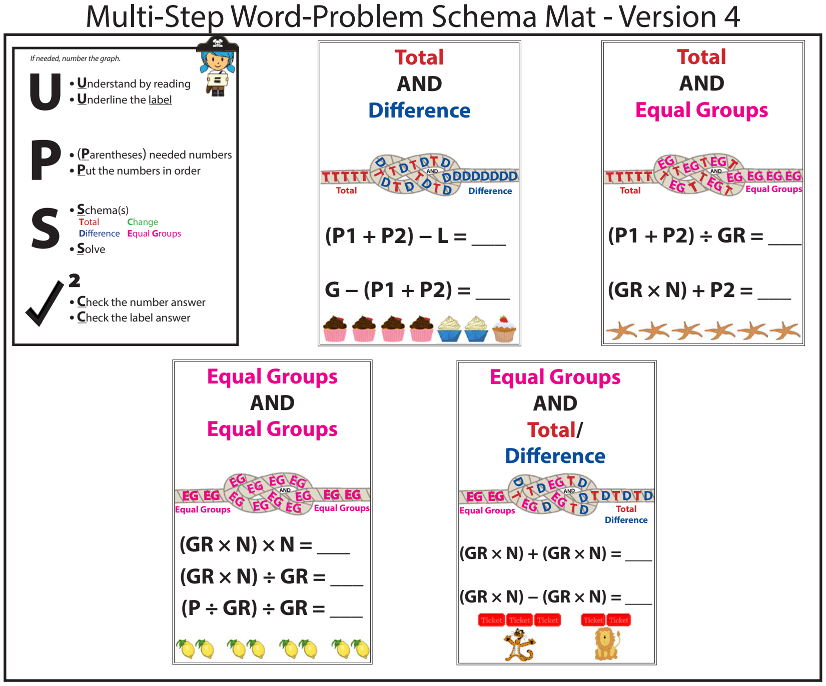
Multi-Step Word-Problem Schema Mat - Version 2



Multi-Step Word-Problem Schema Mat - Version 3



Multi-Step Word-Problem Schema Mat - Version 4



After teachers have introduced the Total and Difference multi-step schema, and later the Change schema, they should display the What Do You Ask Yourself? poster, featured below. The What Do You Ask Yourself? poster, introduced during Lessons 11-13 for multi-step Total and Difference problems and revisited again during Lessons 15-39, provides a prompt for students to ask questions and gesture to determine the correct schema. We encourage teachers to use gestures to help students recall the four schemas. The Total gesture is introduced during Lesson 3. The Difference gesture is introduced during Lesson 8. The Change gesture is introduced during Lesson 14. The Equal Groups gesture is introduced during Lesson 21. Teachers can refer to the Lesson Guides to learn the specific schema gestures to model for students. Students often struggle to identify the correct problem type after all four schemas have been introduced. This poster helps students to distinguish between the Total, Difference, Change, and Equal Groups schemas.

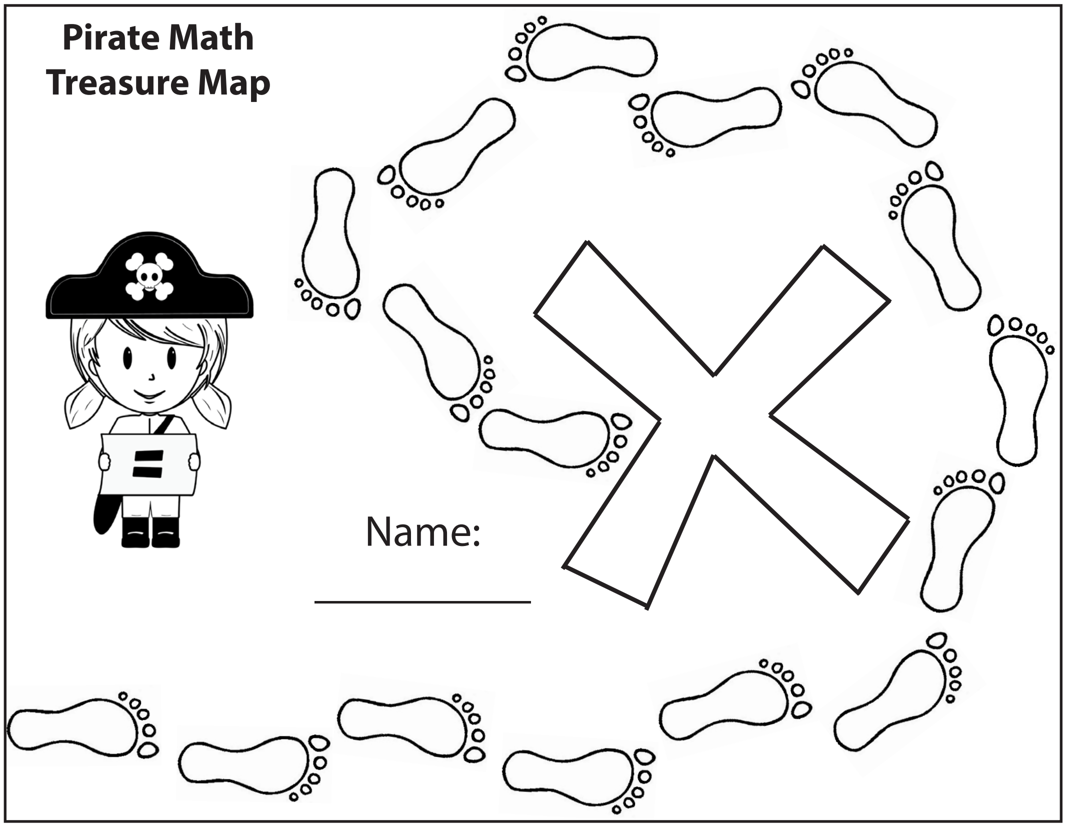
What Do You Ask Yourself?

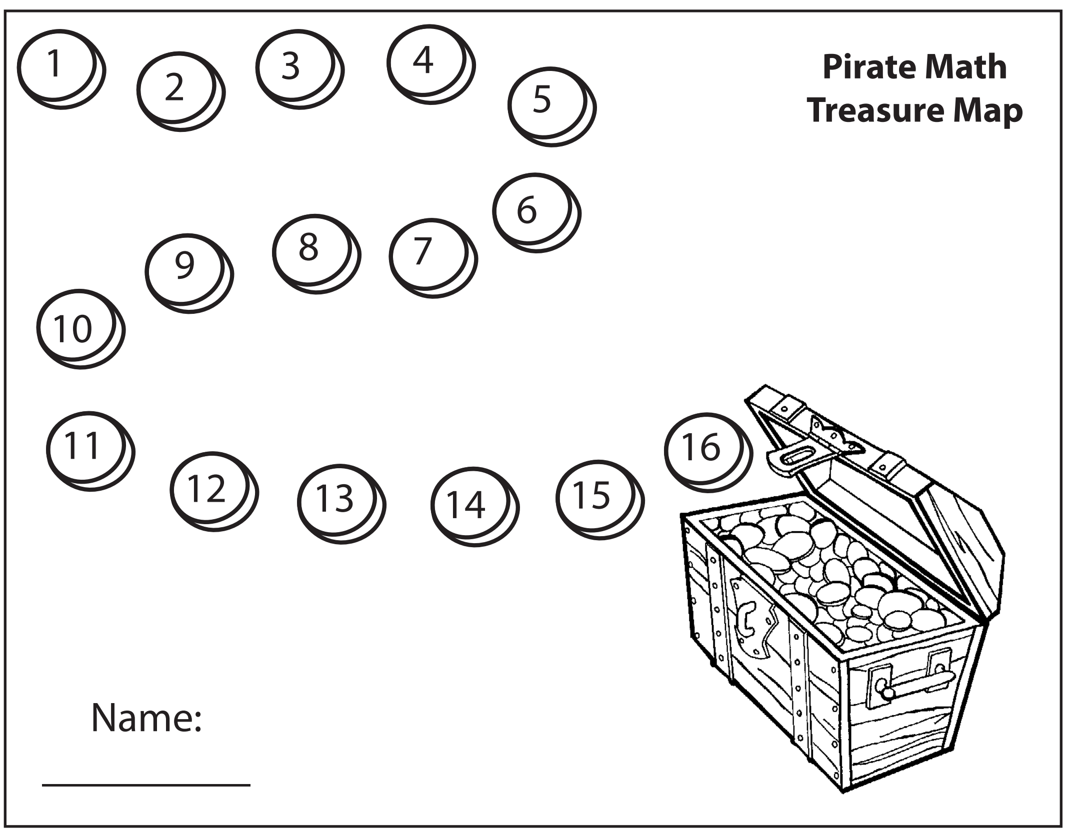
Total	Are parts put together into a total?
Difference	Are two amounts compared for a difference?
Change	Is there a starting amount that increases or decreases to a new amount?
Equal **G**roups	Are there groups with an equal number in each group?

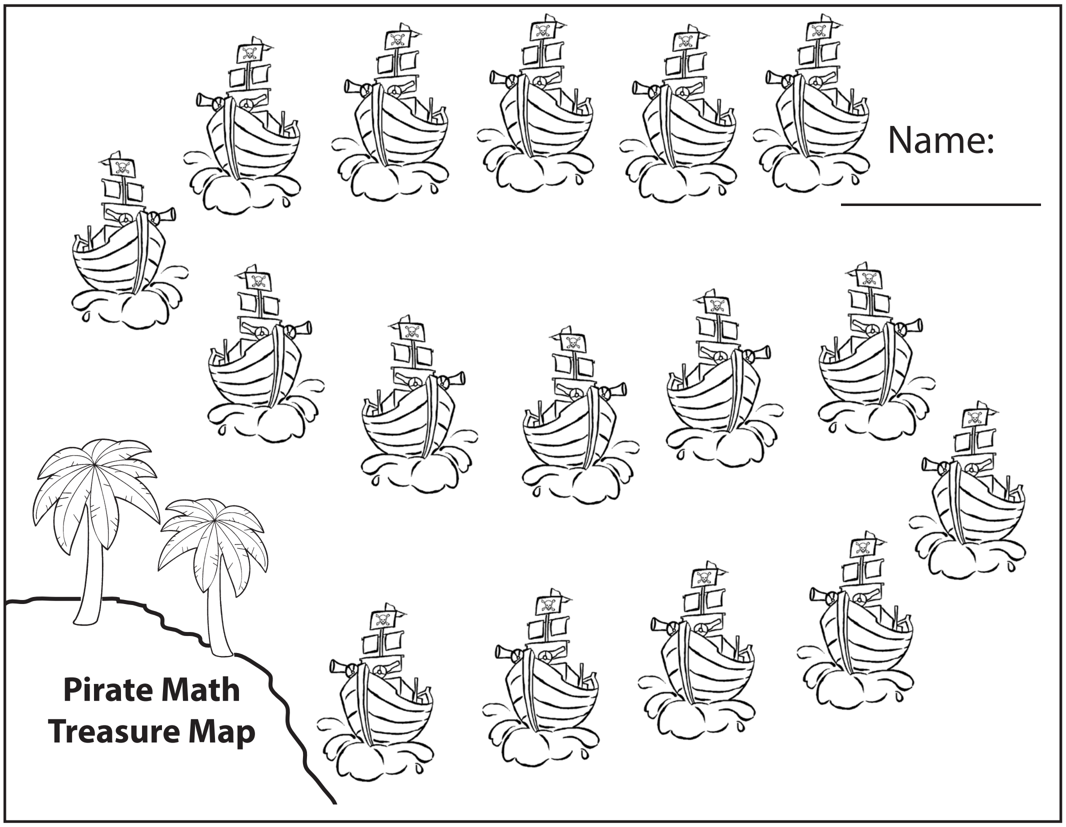
During every lesson, teachers also display the Treasure Map. Throughout each lesson, students can earn coins for their Treasure Map for following the Pirate Math rules. When students reach the end of their Treasure Map, they earn a novelty prize from a treasure box.

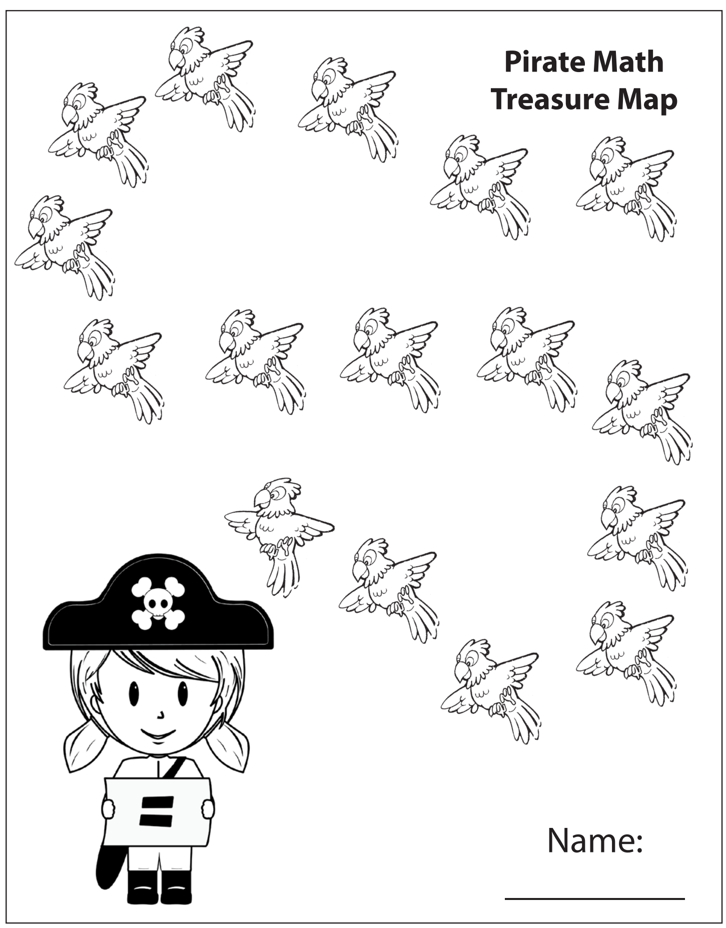
If teachers do not have coins, they can use stamps, stickers, or colored pencils to color the designated number of spaces on the Treasure Map. Similarly, teachers can use any prize bag or box if they do not have a treasure box.

On the following pages are four different variations of the Treasure Map. Teachers can choose one map or alternate maps depending on students' preferences. All four Treasure Map templates are included in this manual.


Pirate Math
Treasure Map
Name:

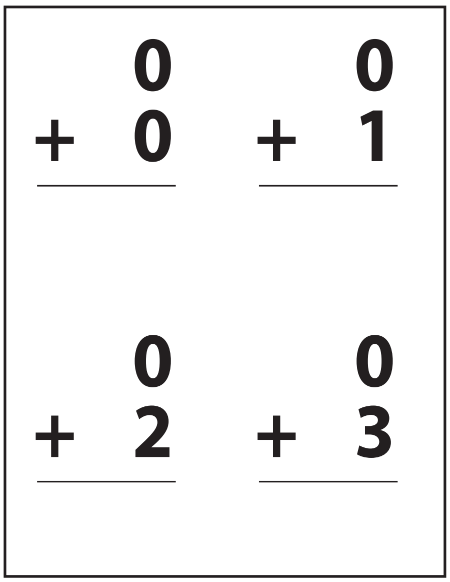

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Pirate Math
Treasure Map
Name:

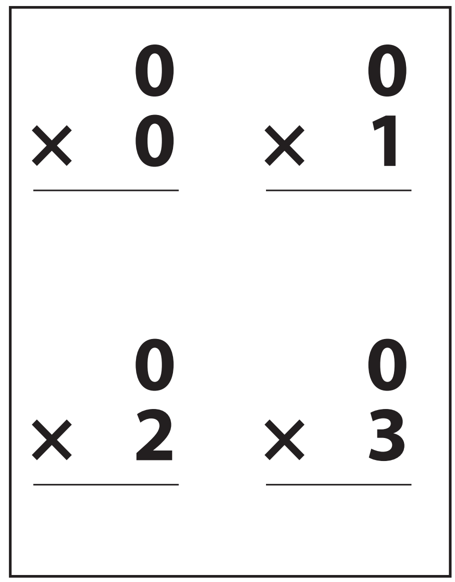

Name:
Pirate Math
Treasure Map


Pirate Math
Treasure Map
Name:

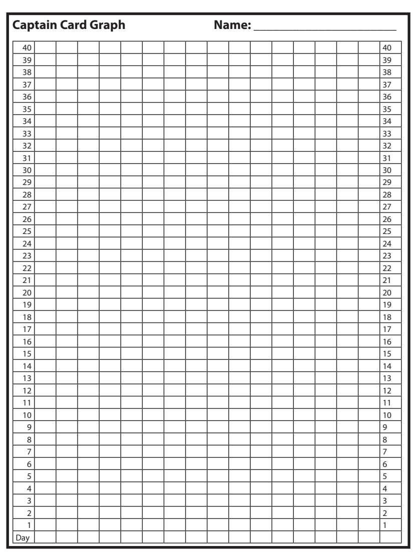
For the Captain Cards activity, teachers need to cut and print the Captain Cards and Captain Cards graph. Templates for the Captain Cards and the Captain Cards graph are included in this manual.

There are two sets of Captain Cards for the multi-step word-problem intervention. The first set includes an addition or subtraction problem on the front side of the card and the correct sum or difference on the back side of the card (Lessons 1-20). The second set includes a multiplication or division problem on the front side of the card and the correct product or quotient on the back side of the card (Lessons 21-39). It is recommended that teachers print these cards double-sided on cardstock. There are four problems per page; teachers should cut each page into fourths using a paper cutter.



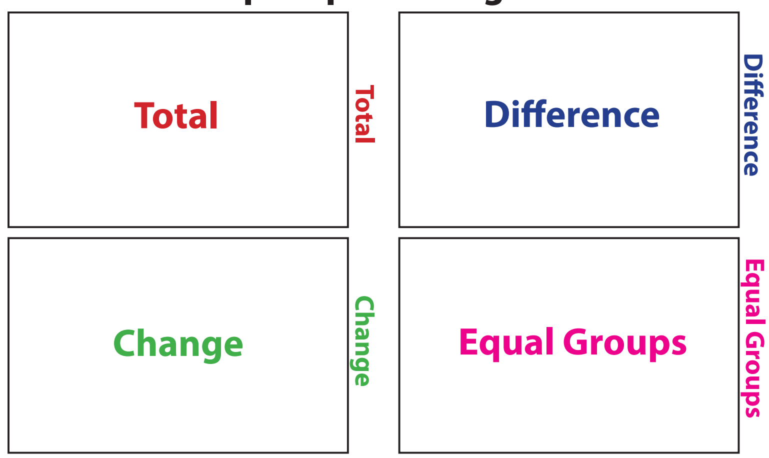


Teachers also need to print the Captain Cards graph, pictured below, in advance of the lesson. At the end of the Captain Cards activity, students graph their higher score from the two trials on the graph below. Teachers should plan to copy extra graphs for easy access after students complete the first graph.



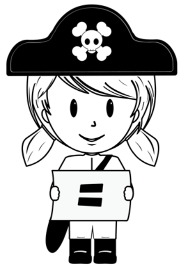
During Shipshape Sorting, which begins during Lesson 3, students participate in schema sorting practice using sorting cards and the sorting mat, displayed below. Templates for the Shipshape Sorting Mat and accompanying cards are included in this manual.

Shipshape Sorting Mat



The Shipshape Sorting cards include a word problem on the front side of the card and the correct schema (i.e., T for Total, D for Difference, C for Change, and EG for Equal Groups) on the back side of the card. It is recommended that teachers print the Shipshape Sorting cards double-sided on cardstock. There are four word problems per page; teachers should cut each page into fourths using a paper cutter. The same word-problem stories are presented across all four schemas to support students in distinguishing among Total, Difference, Change, and Equal Groups problems.

Kate has 42 candies. Ana has 28 candies. How many candies do the girls have?	Miguel has 6 American flags and 6 Mexican flags. How many flags does Miguel have altogether?
Jahiem sold lemonade for 2 days. On the first day Jahiem made $30 and on the second day he made $25. How much money did Jahiem make selling lemonade?	Alina spent 15 minutes practicing the piano. She spent another 7 minutes practicing the flute. How many minutes did Alina spend practicing an instrument?



Other Materials

Other Materials

The following materials are used throughout the program but are not included in this manual.

- Timer
- Cubes
- Gold coins
- Treasure box
- Dry erase board
- Dry erase markers
- Dry erasers
- Blue painter's tape

The timer is used during the timed activities: Captain Cards, Shipshape Sorting, and Jolly Roger Review.

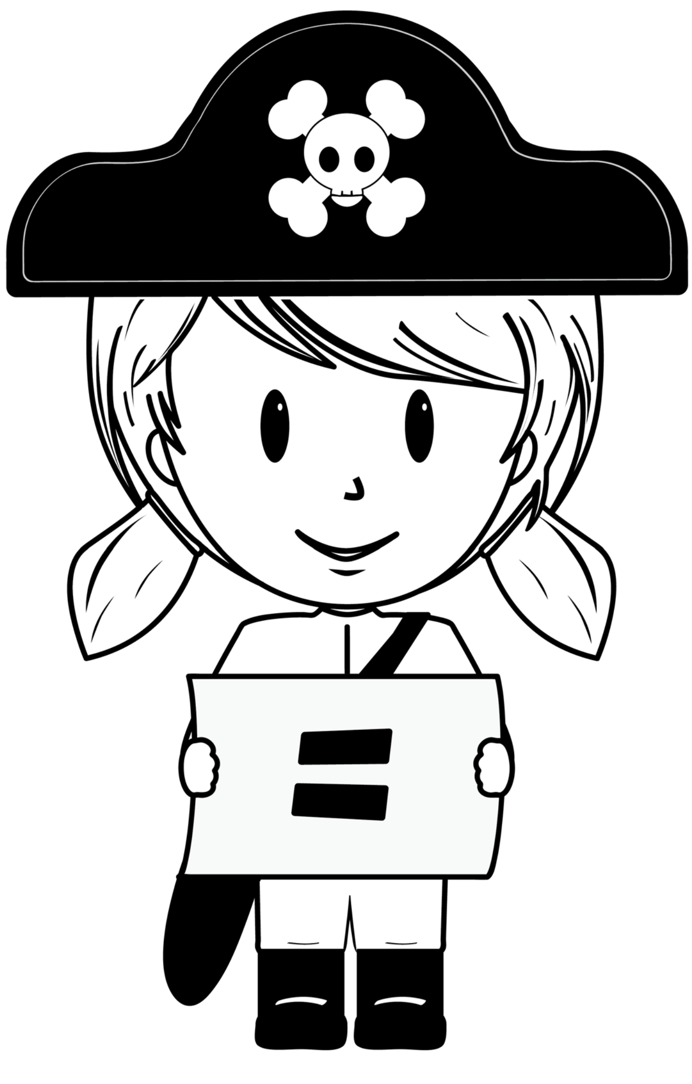
Different colored unit cubes are used during Equation Quest to help students develop their pre-algebraic reasoning skills. The timer and cubes can be purchased from a teacher supply store or a mathematics manipulatives company.

The gold coins and treasure box are used throughout each lesson to reward students for following the Pirate Math rules. As previously mentioned, stamps, stickers, or colored pencils can substitute for gold coins. Teachers can use any prize bag or box if they do not have a treasure box.

The dry erase board, dry erase markers, dry erasers, and blue painter's tape are used during lessons that include Equal Groups problems (i.e., Lessons 21-39) to help students understand the concept of Equal Groups. Students use these materials to illustrate groups with an equal number in each group. Teachers can purchase these materials from a teacher or office supply store.

For all lessons, teachers and students also need pencils.

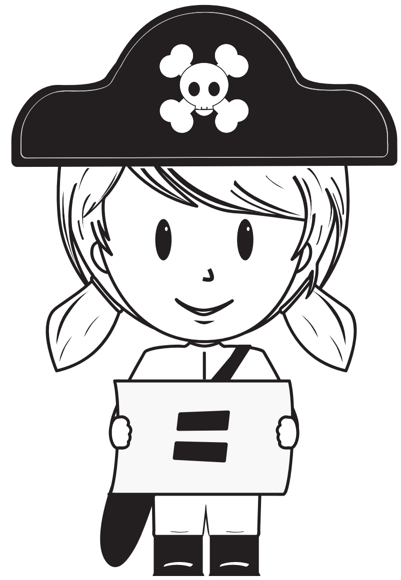
Lesson Guides
1 - 39



Lesson 1

ACTIVITIES

1. Captain Cards
2. ~~Equation Quest~~
3. Buccaneer Problems
   Counting up addition and subtraction
4. ~~Shipshape Sorting~~
5. Jolly Roger Review



Materials

Posters

Pirate Math Rules
Counting Up

Student Materials

Buccaneer Problems: Lesson 1
Jolly Roger Review: Lesson 1
Treasure Map

Tutor Materials

Captain Cards
Timer
Gold coins
Treasure box

Introduction

Hi. My name is ________. This year, we'll work on math word problems. We'll work hard to get better in math.

Display Rules poster.

Pirate Math Rules

Before we get started, let's talk about some rules. This poster (point to Rules poster) **shows us the rules for how to behave when we work together. Look at our first rule** (point)**. It says, "Use inside voice." Look at the picture that goes with this rule** (point to first picture)**. Why is this** (point) **a good picture to remind us about using inside voices?**

(Student responds.)

You're right. We'll work in the (library/hallway)**, so we have to be quiet and use our inside voices. Always use your inside voice. That's our first rule.**

Here's the next rule (point to second rule)**. It says, "Stay seated." Look at the picture that goes with this rule** (point to second picture)**. Why is this a good picture to remind us to stay in our seats?**

(Student responds.)

Good job! The chair reminds us that when we work together, we must stay seated. Let's look at the next rule (point)**. This rule says, "Follow directions." Why is this a good picture to remind us to follow directions** (point to third picture)**?**

(Student responds.)

Yes. The picture reminds us to listen and follow directions. This is a very important rule.

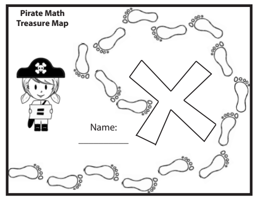
We have one more rule (point to fourth rule)**. This last rule says, "Try your best." Look at this picture** (point to fourth picture)**. Why is this a good picture** (point) **to remind you to try your best?**

(Student responds.)

If you follow these rules, we'll have fun and learn a lot about math!

When we work on math problems together, we'll play Pirate Math Equation Quest. Just like a pirate, you'll have a Treasure Map.

Display Treasure Map.



This Treasure Map has footsteps to color. When you have colored in all of the footsteps and land on the "X," you will get a prize from the treasure box!

Display treasure box.

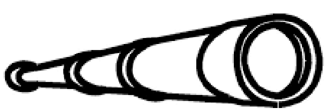
Throughout the lesson, you will earn treasure coins by following the Pirate Math Equation Quest rules. Each time we work together, we'll count the number of coins you earned and color that number of footsteps on the Treasure Map.

What happens when you have enough stickers to land on the big "X" on the map?

You get to pick a prize from the treasure box.


Exactly! You get to pick a prize from the treasure box. Then, you get a new Treasure Map.

I notice that you're following our Pirate Math rules right now. You're using your inside voice, staying seated, and following my directions. You earn a treasure coin for your Treasure Map! (Give student coin.)



1: Captain Cards

The first activity we'll do every day is Captain Cards. Look at these cards.

Display Captain Cards.

Each card has one math problem on it. The problems are addition or subtraction. Later this year, we also will use cards with multiplication and division problems.

I'll show you one card at a time. Look at the problem and tell me the answer as

quickly as you can. If you get the answer correct, I'll put the card in a pile on the table.

You'll have 1 minute to answer as many flash cards as you can. I'll hold up a flash card. You'll give me the answer.

Let's practice. (Hold up flash card.) **What's the answer?**

(Student responds.)

Good! At the end of 1 minute, we'll count the number of cards in the pile. Are you ready? Let's try.

Show Captain Cards for 1 minute.

Good! Let's count the cards in the pile.

Count cards with student.

You answered __ Captain Cards correctly!

Let's try to beat that score. We'll use the same flash cards. I'll show you one card at a time. Look at the problem, and tell me the answer as quickly as you can. Remember, try to beat __. You have 1 minute. Go!

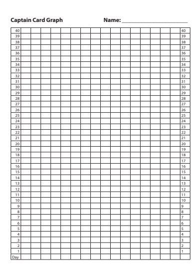
Show Captain Cards for 1 minute.

Let's count the cards in the pile.

Count cards with student.

You answered __ Captain Cards correctly. You beat/did not beat your score.

Now, we'll graph your higher score for today on this graph.



Help student color graph.

Every day we'll warm up our brain with these flash cards. As you get better in math, your graph will get higher and higher!

You did a nice job. You earn a treasure coin!

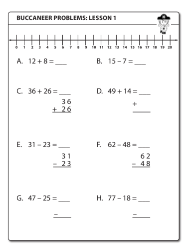
2: Equation Quest

Starts on Lesson 3.

3: Buccaneer Problems

Today, we will review by solving some addition and subtraction problems. Remember, you can always use a number line to help you count. You will see the number line at the top of the worksheet.

Display Buccaneer Problems - Lesson 1.


BUCCANEER PROBLEMS: LESSON 1

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A. 12 + 8 = ___ B. 15 – 7 = ___

C. 36 + 26 = ___ D. 49 + 14 = ___

E. 31 – 23 = ___ F. 62 – 48 = ___

G. 47 – 25 = ___ H. 77 – 18 = ___

Point to A.

What sign tells us to add?

A plus sign.

That's right. A plus sign tells us to add. (Point to plus sign.) **When we add, we combine two or more numbers together.**

What sign tells us to subtract?

A minus sign.

That's right. A minus sign tells us to subtract. (Point to minus sign.) **When we subtract, we compare an amount that's greater and an amount that's less to find the difference.**

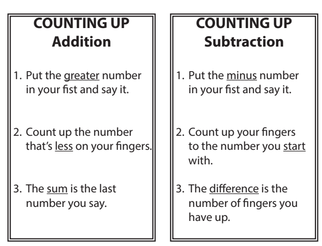
The problems we'll work on today have two numbers you add together or two numbers you compare for a difference. We need to look carefully at the sign to determine if we need to add or subtract.

Look at this first problem (point)**. This problem says 12 plus 8 equals blank. We could use our number line to solve a math problem like this, but we don't always need a number line to count up for adding! You can use your fingers instead. We call this "Counting Up."**

Sometimes when you add two numbers together, you know the answer right away in your brain, and that's great! But sometimes, we don't know the answer right away. Counting Up is a neat trick to help you figure out the answer quickly.

Look at this poster.

Display Counting Up Addition poster.



This poster shows the three steps to Counting Up for addition. Let's use these steps to solve 12 plus 8 equals blank. (Point to A.)

The first step says, "Put the greater number in your fist and say it." (Point to Step 1.) **Which number is the greater number?**

12.

That's right! Start with the greater number, 12. Put that number in your fist and say "12."

Tap closed fist on leg and say "12."

Look at Step 2. (Point to Step 2.) **Step 2 says, "Count up the number that's less on your fingers." Now, count up 8 more, and use your fingers to keep track of how many you're adding. Watch me.**

I put the greater number in my fist, 12 (tap closed fist on leg)**: 13** (hold up 1 finger)**, 14** (hold up 2 fingers)**, 15** (hold up 3 fingers)**, 16** (hold up 4 fingers)**, 17** (hold up 5 fingers)**, 18** (hold up 6 fingers)**, 19** (hold up 7 fingers)**, 20** (hold up 8 fingers)**. I knew I had to add 8 more to 12** (point to "+ 8")**. I used my fingers to make sure I counted up exactly 8 more** (show student the 8 fingers still held up)**.**

Now look at Step 3. (Point to Step 3.) **Step 3 says, "Your answer, or the sum, is the last number you say." Watch: I put the greater number in my fist, 12** (tap closed fist on leg)**: 13** (hold up 1 finger)**, 14** (hold up 2 fingers)**, 15** (hold up 3 fingers)**, 16** (hold up 4 fingers)**, 17** (hold up 5 fingers)**, 18** (hold up 6 fingers)**, 19** (hold up 7 fingers)**, 20** (hold up 8 fingers)**.**

What was the last number I said out loud?

20.

So, what's the sum of 12 plus 8?

20.

That's right! 12 plus 8 equals 20. Write 20 in the blank.

(Student writes 20.)

Great job using Counting Up to solve that addition problem! Now let's use Counting Up to solve a subtraction problem.

Point to B.

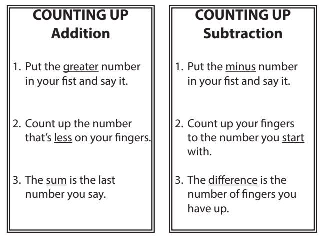
Look at this sign. (Point to minus sign.) **This is a minus sign. A minus sign tells us to subtract.**

We could use our number line to solve a math problem like this, but we don't always need a number line to count up for subtraction! Just like we did with addition, you can use your fingers instead.

You already know how to use Counting Up to solve addition problems. Let's learn how to use Counting Up to solve subtraction problems.

Look at this poster.

Display Counting Up Subtraction poster.



This poster shows us three steps for Counting Up subtraction problems. Let's use these steps to solve this problem: 15 minus 7 equals blank. (Point to B.)

The first step says, "Put the minus number in your fist and say it." (Point to Step 1.) **The minus number is the number directly *after* the minus sign.**

What is the minus number?

It's the number right *after* the minus sign.

What number do you see after the minus sign?

7.

Yes! 7 is the minus number. 7 is the number directly *after* the minus sign. Start with the minus number, 7. Put that number in your fist and say, "7."

Tap closed fist on leg and say "7."

Look at Step 2. (Point to Step 2.) **Step 2 says, "Count up your fingers to the number you start with." So, count up to the number you start with, 15. Watch me. I put the minus number in my fist, 7** (tap closed fist on leg)**: 8** (hold up 1 finger)**, 9** (hold up 2 fingers)**, 10** (hold up 3 fingers)**, 11** (hold up 4 fingers)**, 12** (hold up 5 fingers)**, 13** (hold up 6 fingers)**, 14** (hold up 7 fingers), **15** (hold up 8 fingers).

Now look at Step 3. (Point to Step 3.) **Step 3 says, "Your answer, also called the difference, is the number of fingers you have up." How many fingers am I**

holding up?

8.

So, what's the difference between 15 and 7?

8.

That's right! 15 minus 7 equals 8.

Before we solve the next problem, let's talk about something very important. Do you have your listening ears on?

Yes.

Subtraction problems are not like addition problems. In addition, the order of the numbers doesn't matter. 2 plus 3 is the same as 3 plus 2.

But in a subtraction problem, like 15 minus 7 (point)**, you CANNOT switch the order of the numbers. 15 minus 7 is not the same as 7 minus 15. You can't easily subtract 7 minus 15. In a subtraction problem, you NEVER switch the order of the numbers.**

You always put the minus number in your fist, and count up to the number you start with. Your answer, also called the difference, is the number of fingers you have up.

Let's practice Counting Up together with two-digit numbers. Look at this problem. (Point to C.)

Point to C.

This problem says 36 plus 26 equals blank. First, do you add or subtract?

Add.

Exactly. The plus sign (point) **tells us to add.**

We can write this number sentence two ways. We could write it like this (point to 36 + 26 = ___)**, but it's hard to keep the ones and tens places straight in our heads this way. An easier way to see the ones and tens places is to write the**

problem like this (point to vertical presentation of the problem)**.**

Now we can see which column is for the ones place (point) **and which column is for the tens place** (point)**. This is very important in math, because when we add, we have to add the ones first. Then, we add the tens.**

In fact, let's draw a line down the middle to separate the ones and tens. This will make it easier to do the math. Also, let's circle the plus sign so we remind ourselves to add. To help us remember, we can say, "Draw the line and circle the sign."

Draw vertical line separating ones and tens and circle the plus sign.

Now it's time to add. When adding or subtracting greater numbers, always start in the ones column. Where do I start?

Ones.

Yes, we always start with the ones column. We need to add 6 plus 6 (point)**. Let's do that by counting up on our fingers. Put the greater number in our fist. In this problem, both numbers are 6 so we will put 6 in our fist and count up 6.**

Put the greater number in our fist (show fist and say, "6,")**, and count up: 7** (hold up 1 finger)**, 8** (hold up 2 fingers)**, 9** (hold up 3 fingers)**, 10** (hold up 4 fingers)**, 11** (hold up 5 fingers)**, 12** (hold up 6 fingers)**. The sum is the last number you say, so the sum is what?**

12.

Can you write 12 in the ones place for your answer?

No.

That's right. We can't write a number with two digits in the ones place. We have to regroup. To regroup, we trade in 10 ones for 1 ten, and we place the 1 ten in the tens column. So, instead of 12 ones, we have 1 ten (write "1" above the 3) **and 2 ones** (write 2 in ones place)**.**

I still write 12, but the 1 ten of 12 is written in the tens column (point) **and the 2 ones of 12 are written in the ones column** (point)**.**

When we add the tens, we'll add this 1 (point)**, too. Let's move to the tens column.**

Now we add the tens: 3 tens plus 2 tens, plus 1 more ten (point)**. What's the answer to 3 plus 2, plus 1? Count up on your fingers if you don't know the answer right away.**

6.

Great! In the tens column, 3 tens plus 2 tens equals 5 tens, plus 1 more equals 6 tens, so write 6 in the tens place for the answer.

(Writes.)

So, what's the sum of 36 plus 26?

62.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the sum makes sense. Excellent!

Point to D.

This problem says 49 plus 14 equals blank. First, do you add or subtract?

Add.

Exactly. The plus sign (point) **tells us to add.**

We can write this number sentence two ways. We could write it like this (point to 49 + 14 = ___)**, but it's hard to keep the ones and tens places straight in our heads this way. An easier way to see the ones and tens places is to write the problem vertically. Go ahead and write the problem vertically in the space provided** (point)**. Make sure to line up the tens and ones columns.**

Now we can see which column is for the ones place (point) **and which column is for the tens place** (point)**. This is very important in math, because when we add, we have to add the ones first. Then, we add the tens.**

In fact, let's draw a line down the middle to separate the ones and tens. This will make it easier to do the math. Also, let's circle the plus sign so we remind ourselves to add. To help us remember, we can say, "Draw the line and circle the sign."

Draw vertical line separating ones and tens and circle the plus sign.

Now it's time to add. When adding or subtracting greater numbers, always start in the ones column. Where do we start?

Ones.

Yes, we always start with the ones column. We need to add 9 plus 4 (point)**. Let's do that by counting up on our fingers. Put the greater number in our fist** (show fist and say, "9,")**, and count up: 10** (hold up 1 finger)**, 11** (hold up 2 fingers)**, 12** (hold up 3 fingers)**, 13** (hold up 4 fingers)**. The sum is the last number you say, so the sum is what?**

13.

Can you write 13 in the ones place for your answer?

No.

That's right. We can't write a number with two digits in the ones place. We have to regroup. To regroup, we trade in 10 ones for 1 ten, and we place the 1 ten in the tens column. So, instead of 13 ones, we have 1 ten (write "1" above the 4) **and 3 ones** (write 3 in ones place)**.**

I still write 13, but the 1 ten of 13 is written in the tens column (point) **and the 3 ones of 13 are written in the ones column** (point)**.**

When we add the tens, we'll add this 1 (point)**, too. Let's move to the tens column.**

Now we add the tens: 4 tens plus 1 ten, plus 1 more ten (point)**. What's the answer to 4 plus 1, plus 1? Count up on your fingers if you don't know the answer right away.**

6.

Great! In the tens column, 4 tens plus 1 ten equals 5 tens, plus 1 more equals 6 tens, so write 6 in the tens place for the answer.

(Writes.)

So, what's the sum of 49 plus 14?

63.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the sum makes sense. Excellent!

Nice work with those addition problems with regrouping! You earn a treasure coin!

Now let's practice subtraction with regrouping.

Point to E.

31 minus 23 is the same as blank. Are we going to add or subtract?

Subtract.

We need to subtract. The minus sign (point) **tells us to subtract.**

What should we do first?

Draw a line to separate the tens and ones columns and circle the sign so we remember to subtract.

Yes, that's a good idea. Draw a line to separate the tens and ones columns and circle the sign so we remember to subtract. To help us remember, we can say, "Draw the line and circle the sign."

(Draws and circles.)

So, where do we start?

Ones column.

Good answer. So, the ones column says, 1 minus 3 (point to ones column)**. Which number is the minus number?**

3.

That's right! The minus number is the number that comes after the minus sign (point)**. To count up, we start with the minus number, 3, and count up to the number you start with, 1. Look at the number line at the top of your worksheet. Can we start at 3** (pause) **and easily count *up* to 1** (pause)**?**

No.

Another way to think about this is, if you have *1* (point to 1)**, can you easily subtract *3*** (point)**?**

No.

You're right. You can't easily subtract 3 from 1. Can we reverse the numbers?

No.

We can't reverse the numbers in subtraction. So, we can't easily subtract 3 from 1, and we can't reverse the numbers and just subtract 1 from 3.

So, how do we solve this problem?

Regroup.

Yes, we need to regroup, or exchange the number we start with, 1 (point)**. To do this, we subtract 1 ten from these 3 tens** (point to 3 with pencil, and then cross it out)**. Now we're left with 2 tens** (write 2 above the crossed out 3)**.**

We exchange that 1 ten for 10 ones, and give them to the 1 one we already have. This 1 becomes 11 (write 1 next to the 1 one so that it looks like 11)**.**

Now, if we have 11 (point to 11)**, can we easily subtract our minus number, 3, from 11?**

Yes.

Great! Do that now. Use Counting Up if you don't know the answer right away in your head. What's the difference?

8.

11 minus 3 is the same as 8. Write 8 for your difference in the ones place.

(Writes.)

Now move to the tens column. 2 tens minus 2 tens (point)**. What's the difference between 2 minus 2? Count up on your fingers if you don't know the answer right away.**

0.

2 tens minus 2 tens is the same as 0 tens, so write 0 in the tens place for your difference.

(Writes.)

So, what's the difference between 31 minus 23?

8.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the difference makes sense. Excellent!

Point to F.

62 minus 48 is the same as blank. Are we going to add or subtract?

Subtract.

We need to subtract. The minus sign (point) **tells us to subtract.**

What should we do first?

Draw a line to separate the tens and ones columns and circle the sign so we remember to subtract.

Yes, that's a good idea. Draw a line to separate the tens and ones columns and circle the sign so we remember to subtract. To help us remember, we can say, "Draw the line and circle the sign."

(Draws and circles.)

So, where do we start?

Ones column.

Good answer. So, the ones column says, 2 minus 8 (point to ones column)**. Which number is the minus number?**

8.

That's right! The minus number is the number that comes after the minus sign (point)**. To count up, we start with the minus number, 8, and count up to the number you start with, 2. Look at the number line at the top of your worksheet. Can we start at 8** (pause) **and easily count *up* to 2** (pause)**?**

No.

Another way to think about this is, if you have *2* (point to 2)**, can you easily subtract *8*** (point)**?**

No.

You're right. You can't easily subtract 8 from 2. Can we reverse the numbers?

No.

We can't reverse the numbers in subtraction. So, we can't easily subtract 8 from 2, and we can't reverse the numbers and just subtract 2 from 8.

So, how do we solve this problem?

Regroup.

Yes, we need to regroup, or exchange the number we start with, 2 (point)**. To do this, we subtract 1 ten from these 6 tens** (point to 6 with pencil, and then cross it out)**. Now we're left with 5 tens** (write 5 above the crossed out 6)**.**

We exchange that 1 ten for 10 ones, and give them to the 2 ones we already have. This 2 becomes 12 (write 1 next to the 2 ones so that it looks like 12)**.**

Now, if we have 12 (point to 12)**, can we easily subtract our minus number, 8, from 12?**

Yes.

Great! Do that now. Use Counting Up if you don't know the answer right away in your head. What's the difference?

4.

12 minus 8 is the same as 4. Write 4 for your difference in the ones place.

(Writes.)

Now move to the tens column. 5 tens minus 4 tens (point)**. What's the difference between 5 minus 4? Count up on your fingers if you don't know the answer right away.**

1.

5 tens minus 4 tens is the same as 1 ten, so write 1 in the tens place for your difference.

(Writes.)

So, what's the difference between 62 minus 48?

14.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the difference makes sense. Excellent!

Point to G through P.

Now it's your turn. We'll work each problem one at a time.

First, let's look at the sign to decide whether to add or subtract.

Then, we'll write the problem to make it easier to solve. We will draw a line to separate the tens and ones columns and we will circle the sign to help us remember to add or subtract.

Let's get started!

(Student works.)

Provide feedback as necessary.

Excellent work! You earn a treasure coin!

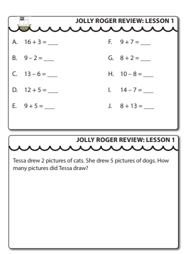
4: Shipshape Sorting

Starts on Lesson 3.

5: Jolly Roger Review

The last activity we do every day is practice problems. We call these problems our Jolly Roger Review.

Display Jolly Roger Review - Lesson 1.


JOLLY ROGER REVIEW: LESSON 1

A. 16 + 3 = ___
B. 9 – 2 = ___
C. 13 – 6 = ___
D. 12 + 5 = ___
E. 9 + 5 = ___
F. 9 + 7 = ___
G. 8 + 2 = ___
H. 10 – 8 = ___
I. 14 – 7 = ___
J. 8 + 13 = ___

JOLLY ROGER REVIEW: LESSON 1

Tessa drew 2 pictures of cats. She drew 5 pictures of dogs. How many pictures did Tessa draw?

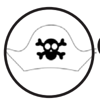
On one side are addition and subtraction problems. On the other side is a word problem. You'll learn how to solve these word problems soon.

You have 2 minutes to work on the addition and subtraction problems. Go ahead and get started. Don't forget to use your Counting Up!

Set timer for 2 minutes.

Now, you have 2 minutes to work on the word problem. Go ahead.

Set timer for 2 minutes.

 **Great job! You earn another treasure coin!**

Treasure Map

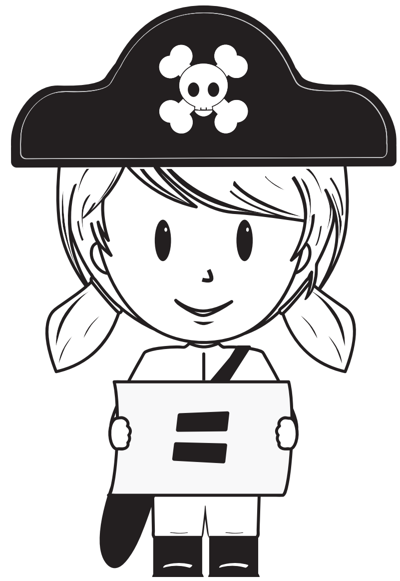
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ footsteps on your Treasure Map! (Student colors.)

Remember, once you fill in the footsteps to the 'X' in the middle of the map, you'll choose a prize out of the treasure box!

Lesson 2



ACTIVITIES

1. Captain Cards
2. ~~Equation Quest~~
3. Buccaneer Problems
   Numbering charts and graphs
4. ~~Shipshape Sorting~~
5. Jolly Roger Review

Materials

Posters

Pirate Math Rules
Counting Up

Student Materials

Buccaneer Problems: Lesson 2
Jolly Roger Review: Lesson 2
Treasure Map

Tutor Materials

Captain Cards
Timer
Gold coins
Treasure box

Introduction

Pirate Math Rules

Display Rules poster.

Before we start our math today, let's go over our rules.

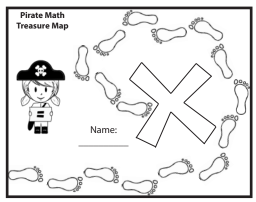
Look at the pictures on our poster (point to Rules poster)**. Tell me our rules.**

(Responds.)

You're right! We have to use our inside voice, stay seated, follow directions, and try our best (point to each corresponding rule)**. Great job!**

Remember, when we work on math problems together, we play Pirate Math Equation Quest. Just like a pirate, you have a Treasure Map.

Display Treasure Map.



This Treasure Map has places for footsteps. When you've colored enough footsteps to land on the "X," you get a prize from the treasure chest!

I like the way you're following our Pirate Math Equation Quest rules right now.

You're using your inside voice, staying seated, and following my directions. You earn a treasure coin for your Treasure Map! (Give student coin.)

1: Captain Cards

Follow dialogue presented in Lesson 1.

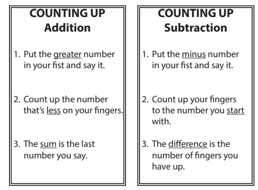
2: Equation Quest

Starts on Lesson 3.

3: Buccaneer Problems

Let's review addition and subtraction. Remember, if you work hard and listen

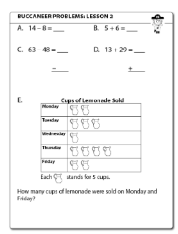
to directions, you'll earn more treasure coins to mark on your Treasure Map. Let's use the Counting Up posters while we add and subtract.



Show Counting Up posters to student.

Now, sometimes you know the answer to an addition or subtraction problem right away in your head, and that's great! But if you don't know the answer right away, count up on your fingers.

Point to A.



Look at this problem. 14 minus 8. Do you add or subtract?

Subtract.

What sign tells you to subtract?

The minus sign.

If we need to subtract, which Counting Up steps do we follow?

(Points.)

Let's say the steps together.

Put the minus number in your fist and say it.
Count up your fingers to the number you start with.
The difference is the number of fingers you have up.

Let's say the steps again.

Put the minus number in your fist and say it.
Count up your fingers to the number you start with.
The difference is the number of fingers you have up.

Let's count up. "Put the minus number in your fist and say it." What's the minus number?

8.

That's right. The minus number is 8. 8 is the number directly after the minus sign (point)**.**

(Taps fist.)

"Count up your fingers to the number you start with."

(Counts up.)

"The difference is the number of fingers you have up." What's the difference?

6.

Write 6.

(Writes.)

So, 14 minus 8 is the same as?

6.

Yes. 14 minus 8 is the same as 6.

Point to B.

Look at this problem. 5 plus 6. Do you add or subtract?

Add.

What sign tells you to add?

The plus sign.

If we need to add, which Counting Up steps do we follow?

(Points.)

Let's say the steps together.

Put the greater number in your fist and say it.
Count up the number that's less on your fingers.
The sum is the last number you say.

Let's say the steps again.

Put the greater number in your fist and say it.
Count up the number that's less on your fingers.
The sum is the last number you say.

So, "Put the greater number in your fist and say it." What's the greater number?

6.

(Taps fist.)

Step 2 says, "Count up the number that's less on your fingers." Do that now.

(Counts up.)

Step 3 says, "The sum is the last number you say." So, what's the sum of 5 plus 6?

11.

That's right! 5 plus 6 is the same as 11. Go ahead and write 11.

(Writes.)

So, 5 plus 6 is the same as what?

11.

Look at this problem.

Point to C.

This problem says 63 minus 48 is the same as blank. This problem has a minus sign (point)**, so do we add or subtract?**

Subtract.

That's right. The minus sign tells us to subtract. We can write this number sentence two ways. We can write it like this (point to 63 – 48 = ___)**, but it's hard to keep the ones and tens places straight in our heads this way. An easier way to see the ones and tens places is to write the problem vertically. Rewrite the problem here.**

(Rewrites.)

Before subtracting, let's draw a line down the middle to separate the tens and ones columns. Go ahead and draw a line. Also, let's circle the minus sign so we remind ourselves to subtract. To help us remember, we can say, "Draw the line and circle the sign."

(Draws and circles.)

So, where do we start?

Ones column.

Good answer. So, the ones column says, 3 minus 8 (point to ones column)**. Which number is the minus number?**

8.

That's right! The minus number is the number that comes after the minus sign (point)**. To count up, we start with the minus number, 8, and count up to the number you start with, 3. Picture a number line in your head. Can we start at 8** (pause) **and easily count *up* to 3** (pause)**?**

No.

You're right. You can't easily subtract 8 from 3. Can we reverse the numbers?

No.

We can't reverse the numbers in subtraction. So, we can't easily subtract 8 from 3, and we can't reverse the numbers and just subtract 3 from 8.

So, how do we solve this problem?

Regroup.

Yes, we need to regroup, or exchange the number we start with, 3 (point)**. To do this, we subtract 1 ten from these 6 tens** (point to 6 with pencil, and then cross it out)**. Now we're left with 5 tens** (write 5 above the crossed out 6)**.**

We exchange that 1 ten for 10 ones, and give them to the 3 ones we already have. This 3 becomes 13 (write 1 next to the 3 ones so that it looks like 13)**.**

Now, if we have 13 (point to 13)**, can we subtract our minus number, 8, from 13?**

Yes.

Great! Do that now. Use Counting Up if you don't know the answer right away in your head.

5.

13 minus 8 is the same as 5. Write 5 for your difference in the ones place.

(Writes.)

Now move to the tens column. 5 tens minus 4 tens (point)**. What's the difference between 5 minus 4? Count up on your fingers if you don't know the answer right away.**

1.

5 tens minus 4 tens is the same as 1 ten, so write 1 in the tens place for your difference.

(Writes.)

So, what's the difference between 63 minus 48?

15.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the difference makes sense. Excellent!

Look at this problem.

Point to D.

13 plus 29. This problem has a plus sign (point)**, so do we add or subtract?**

Add.

That's right. The plus sign tells us to add. We can write this number sentence two ways. We can write it like this (point)**, but what's a better way to write it?**

Vertically.

Go ahead and write the problem vertically, or up and down.

(Writes.)

Before adding, let's also draw a line down the middle to separate the tens and ones columns. Go ahead and draw a line. Also, let's circle the plus sign so we remind ourselves to add. To help us remember, we can say, "Draw the line and circle the sign."

(Draws and circles.)

So, where do we start?

Ones column.

Yes, I always start with the ones column. We need to add 3 plus 9 (point)**. What's 3 plus 9? If you don't know the sum, count up.**

12.

Can you write 12 in the ones place for your answer?

No.

That's right. We can't write a number with two digits in the ones place. We have to regroup. To regroup, we trade in 10 ones for 1 ten, and we place the 1 ten in the tens column. So, instead of 12 ones, we have 1 ten (write "1" above the 1) **and 2 ones** (write 2 in ones place)**.**

I still write 12, but the 1 ten of 12 is written in the tens column (point) **and the 2 ones of 12 are written in the ones column** (point)**.**

When we add the tens, we'll add this 1 (point)**, too. Let's move to the tens column.**

Now we add the tens: 1 ten plus 2 tens, plus 1 more ten (point)**. What's the answer to 1 plus 2, plus 1? Count up on your fingers if you don't know the answer right away.**

4.

Great! In the tens column, 1 tens plus 2 tens equals 3 tens, plus 1 more equals 4 tens, so write 4 in the tens place for the answer.

(Writes.)

So, what's the sum of 13 plus 29?

42.

Now we need to check for reasonableness. Did we solve the problem correctly?

(Responds.)

Yes, so you know the sum makes sense. Excellent!

Nice work with those problems! You earn a treasure coin!

Now, let's do something different. Next time, we'll start to work on solving word problems. Sometimes you find the numbers you need to solve word problems right there, in the word problem. Sometimes, though, the word problem comes with a table, chart, or a graph.

Before solving a word problem, we'll always number the table, chart, or graph. This will make solving the word problem easier.

Point to E.

Here's a word problem (point) **with a table** (point)**. This table says, "Cups of Lemonade Sold** (point)**." The days of the week are on this side of the graph** (point)**. "Monday, Tuesday, Wednesday, Thursday, Friday."**

So this table tells us how many cups of lemonade were sold for each day of the week.

To figure out how to read and number this graph, we look for any special directions about the graph. Down here at the bottom, we see directions (point)**. We call these directions the key. The key says, "Each picture of lemonade stands for 5 cups."**

Because each picture of lemonade stands for 5 cups, we can count by fives to see how many cups were sold each day.

Let's start with Monday (point)**. Monday has 1** (point)**, 2** (point) **pictures of lemonade. So, let's count by fives: 5, 10. How many cups of lemonade were sold on Monday?**

10.

So, let's write 10 next to "Monday".

(Writes.)

Look at Tuesday (point)**. Remember, the special directions or the key down here tells you that each picture stands for five cups. So we count by fives. How many cups of lemonade were sold on Tuesday? Let's count by fives. 5, 10, 15.**

15.

15 cups of lemonade were sold on Tuesday. So, what should you write next to "Tuesday"?

15.

Write 15.

(Writes.)

Let's number Wednesday (point)**. How many cups of lemonade were sold on Wednesday? Remember to count by fives.**

5.

Write 5.

(Writes.)

How many cups of lemonade were sold on Thursday (point)**? Go ahead and number it.**

(Writes.)

How many cups of lemonade were sold on Friday (point)**? Go ahead and number it.**

(Writes.)

Now that we've numbered the table, let's read this word problem and answer the question. "How many cups of lemonade were sold on Monday and Friday?" What do we need to do to solve this problem?

Add the cups from Monday and Friday.

That's right. We've already numbered the table, so this should be easy. How many cups were sold on Monday?

10.

How many cups were sold on Friday?

10.

So, we need to add together 10 plus 10. What's 10 plus 10?

20.

Very good. 10 plus 10 is the same as 20. So, I'll write 20 below the word problem.

Write 20.

There's one other thing you need to know about answering word problems. Whenever you write your answer for a word problem, you always write a number. That's easy to remember. But that's not enough. You also must write a label. A label is a word that tells us what the number is talking about. We already have part of our answer, the number 20. Now we have to write our label. What is the number 20 talking about? Bears? Canoes? Cups?

Cups.

Excellent. 20 tells about the number of cups. So, let's write our label, "cups," next to the number 20.

Write cups.

So, help me remember. What should we do anytime we see a table or graph with a word problem?

Number it.

That's right. You number the table or graph before reading and answering the word problem. That makes doing the word problem easier if you have the table or graph labeled before you start working.

Point to F.

Let's do another problem together. This graph shows different kinds of animals at the zoo. The animals are listed at the bottom of the graph (point)**. How many different kinds of animals are shown on this graph?**

4.

Yes. There are lions (point)**, monkeys** (point)**, giraffes** (point)**, and zebras** (point) **at the zoo.**

Now, look over here on the left side of the graph (point)**. The bottom number is 0 and the top number is 8. We use these numbers to see how many lions, monkeys, giraffes, and zebras are at the zoo.**

Watch me. Let's start with the lions. I put my finger at the top of the lions' box. (Place finger at top of lions' box.) **To know how many lions are at the zoo, I slide my finger over to the numbers on the left side.** (Slide finger over to number 3.) **My finger is on the number 3. So, there are 3 lions at the zoo. Let's write the number 3 on top of the lions' box.**

(Writes.)

What's the next animal on this graph?

Monkeys.

That's right. Let's see how many monkeys are at the zoo. I put my finger on the monkeys' box. (Place finger at top of monkeys' box.) **To know how many monkeys are at the zoo, I slide my finger from the top of the monkeys' box to the number on the left side.** (Slide finger over to number 7.) **How many monkeys are at the zoo?**

7.

Very good. There are 7 monkeys at the zoo. Where should we write 7?

On top of the monkeys' box.

Write 7 on top of the monkeys' box.

(Writes.)

How many giraffes are at the zoo?

2.

Very good. There are 2 giraffes at the zoo. Where should I write the number 2?

On top of the giraffes' box.

(Writes.)

Are we finished numbering the graph?

No.

That's right. We still have to number the zebras. How many zebras are at the zoo?

4.

Yes. To decide the number of zebras, move your finger to the top of the zebras' box then slide your finger over to the left side.

Write 4 on top of the zebras' box.

(Writes.)

Great work! You did a nice job numbering that graph! Now that we've numbered the graph, let's read this word problem (point) **and answer the question.**

"How many lions and giraffes are at the zoo?"

What do we need to do to solve this problem?

Add the lions and giraffes together.

Yes. We have to add the number of lions to the number of giraffes. Does the story tell us how many lions and giraffes there are?

No.

Where should we look for that information?

In the graph.

How many lions are at the zoo?

3.

How many giraffes are at the zoo?

2.

So, we have 3 lions and 2 giraffes. To find the total number of lions and giraffes, we can add 3 plus 2. What's 3 plus 2?

5.

That's right. 3 lions plus 2 giraffes is the same as 5. So, to answer the question, write 5 below the word problem.

(Writes.)

There's one more thing we need to do. When you write your answer for a word problem, you always write a number. That's easy to remember. But that's not enough. Whenever your answer to a word problem is a number, you also must write a label. What's a label?

It's a word that tells us about the number.

A label is a word that tells us what the number is talking about. We already have part of our answer, the number 5. Now we have to write our label. What is the number 5 talking about?

Animals *or* lions and giraffes.

Excellent. 5 tells about the number of lions and giraffes. So, let's write our label, "lions and giraffes," next to the number 5.

(Writes.)

That was good work! So, whenever you see a graph, what should you do even before you read the word problem?

Number it.

Good. Always number a graph before you work on the word problem. Let's practice another graph problem together.

Point to G.

There's a graph at the top (point)**. There's a question at the bottom** (point)**. Every time you see a graph, what should you do?**

Number the graph.

That's right. You should number the graph before you read and answer the word problem. What's this graph showing us?

Number of soccer goals scored.

Just like we numbered the graph with the lines going up and down, we number this graph with the lines going side to side.

So, how many soccer goals did Alex score? I slide my finger to the end of Alex's line. (Slide finger to right.) **Then, I slide my finger down to the numbers to see how many soccer goals Alex scored.** (Slide finger down to 5.) **The end of the graph is between the numbers 4 and 6, which means that Alex scored 5 goals.**

Write 5 next to Alex's name.

(Writes.)

How many goals did Bailey score?

4.

That's right. Bailey scored 4 goals. So, write 4 next to Bailey's name.

(Writes.)

How many goals did Cara score?

6.

Very good! Write 6 next to Cara's name.

(Writes.)

Label the number of goals for Dan and Emma.

(Writes.)

Now that we've numbered the graph, we can read and answer the word problem. The word problem says, "Which kids scored the same number of goals?" How do we decide who scored the same number of goals?

Find the two numbers that are the same.

Very good. To decide who scored the same number of goals, find the two numbers that are the same. What two numbers are the same?

4.

So, who scored the same number of goals?

Bailey and Dan.

Good. Bailey and Dan scored the same number of goals. So, we'll write "Bailey and Dan" under the word problem.

(Writes.)

So, every time you see a table or graph, what should you do first?

Number it.

That's right. Numbering a table or graph makes solving the word problem much easier.

Nice work with those graphs! You earn a treasure coin!

4: Shipshape Sorting

Starts on Lesson 3.

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

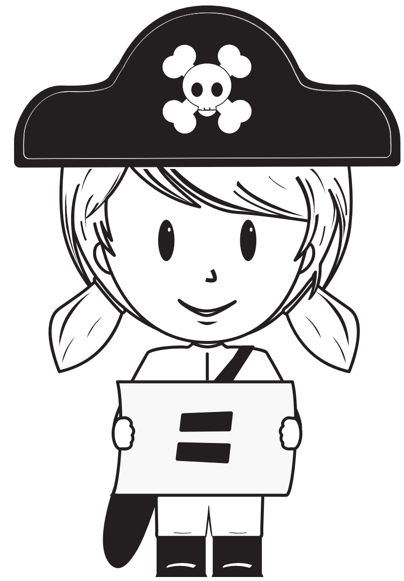
Go ahead and color __ footsteps on your Treasure Map! (Student colors.)

Remember, once you fill in the footsteps to the 'X' in the middle of the map, you'll choose a prize out of the treasure box!

Lesson 3

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total with T missing
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 3
Buccaneer Problems: Lesson 3
Jolly Roger Review: Lesson 3
Crayons
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Every day, before we start solving word problems, we'll do some practice about the symbols used in math. Today, let's talk about the equal sign.

Point to equal sign.

This is the equal sign. The equal sign means *the same as.* When there's an equal sign, people say equals or *the same as*. When there's an equal sign (point)**, what do people say?**

Equals or the same as.

The equal sign means equals, but the equal sign also means *the same as*. The same as means the same thing as equals. When you see the equal sign, I want you to say *the same as*. What would I like for you to say when you see this sign (point)**?**

The same as.

That's right. Say *the same as* (point to "the same as")**.**

Let's look at some number sentences. We'll read each sentence. When you see the equal sign, remember to say *the same as*.

Point to A.

This number sentence says, 4 plus 6 is *the same as* (point to =) **10. Let's say that together.**

4 plus 6 is the same as 10.

Let's read it again.

4 plus 6 is the same as 10.

Point to B.

Read this number sentence.

5 plus 8 is the same as 13.

Yes. 5 plus 8 is *the same as* (point to =) **13.**

Point to C.

Now, this number sentence looks a little different. We'll read it from left (point)

to right (point)**. 5 is *the same as*** (point to =) **2 plus 3. Let's say that together.**

5 is the same as 2 plus 3.

What do you say when you see the equal sign?

The same as.

Point to D.

Let's read this number sentence.

21 plus 54 is the same as 75.

Great. 21 plus 54 is *the same as* 75.

Point to E.

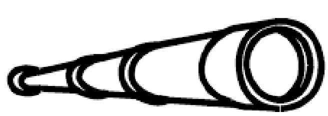
Try this number sentence. Remember, the equal sign means *the same as*.

75 is the same as 21 plus 54.

It doesn't matter where the equal sign is in a number sentence. Whenever you see the equal sign, you say *the same as*. What do you say?

The same as.

Great! We'll practice this more next time!



3: Buccaneer Problems

Yesterday we started working on word problems. What do we always do first when we see a table or graph?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we have in our answer?

A number and a label.

Very good. You must have a number *and* a label. Why do we need a label?

A label is a word that tells us what the problem is mostly about.

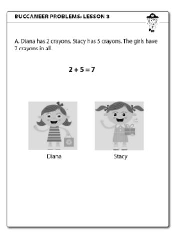
Excellent. A label is a word that tells us what the problem is mostly about. A label also tells us about our missing information.

Today, we'll work on math word problems where the important information is in a <u>story</u>. We need to read the story carefully to find the important information.

Today, we'll talk about Total problems.

Total means the <u>entire</u> amount, or the <u>whole</u> amount. In a Total problem, two or more parts are <u>put together</u> into a <u>total</u>. Listen to this Total story.

Point to A.


BUCCANEER PROBLEMS: LESSON 3

A. Diana has 2 crayons. Stacy has 5 crayons. The girls have 7 crayons in all.

2 + 5 = 7

"Diana has 2 crayons. Stacy has 5 crayons. The girls have 7 crayons in all."

Circle 2, 5, and 7 in the story as you say the following:

This is a Total story because we have two parts, Diana's crayons and Stacy's crayons. The parts are put together into a total number of crayons.

Here's the number sentence that goes with this story (point)**: 2 plus 5 is the same as 7. This number sentence stands for what's happening in this Total story.**

Diana's 2 crayons (point to 2 in number sentence) **and Stacy's 5 crayons** (point to 5 in number sentence) **are put together into a total of 7** (point to 7 in number sentence) **crayons.**

Display crayons.

Let me show you how this works. We'll use these crayons. Look at this picture (point)**. This is a picture of Diana. Her name is written here** (point)**. Now here is a picture of Stacy** (point)**. Her name is written here** (point)**.**

How many crayons does Diana have?

2.

That's right. Let's count 2 crayons. 1, 2. Put two crayons underneath Diana's picture.

(Places crayons.)

How many crayons should Stacy have?

5.

That's right. Let's count 5 crayons. 1, 2, 3, 4, 5. Put 5 crayons underneath Stacy's picture.

(Places crayons.)

In Total problems, we put parts together into a total.

Hold out two hands; clasp hands together. Continue using hand motions throughout.

In this problem, Diana's crayons are part 1 (raise one hand)**. Stacy's crayons are part 2** (raise other hand)**.**

I put two parts together into a <u>total</u> (clasp hands)**. Let's see how many the total is. I put part 1, Diana's crayons, together with part 2, Stacy's crayons. That makes a total of 7 crayons in all.**

Count the 7 crayons.

2 plus 5 is the same as 7. 7 is the total number of crayons.

The number sentence 2 plus 5 is the same as 7 matches the story.

Point to 2 + 5 = 7.

All Total problems have the same kind of number sentence: Part 1 plus part 2 is the same as the total. We remember this as P1 plus P2 is the same as T.

Write P1 + P2 = T underneath 2 + 5 = 7.

We call P1 plus P2 is the same as T our Total equation. Equation is a fancy word. Say it with me.

Equation.

Write the word equation next to P1 + P2 = T.

Equation has most of the word *equal* in it.

Underline "equa" in equation.

An equation has the equal sign in it, like P1 plus P2 is the same as T has the equal sign (point to equal sign)**. We call P1 plus P2 is the same as T our Total equation because it stands for what happens in a Total problem. Let's say the Total equation together.**

P1 plus P2 is the same as T.

What does P1 stand for?

Part 1.

What does P2 stand for?

Part 2.

And what does T stand for?

Total.

What's our Total equation?

P1 plus P2 is the same as T.

That's right. Part 1 plus part 2 is the same as the total.

Now, let's think about word problems.

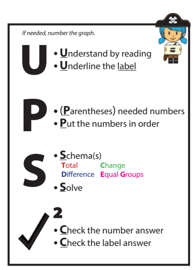
We call our program Pirate Math Equation Quest because we have to be math pirates. When pirates bury their treasures, they mark the treasures so they can find them. We'll use a blank (__) to mark our word-problem treasures. The treasure is the word-problem answer!

Some word problems will be easy. But other word problems will be much harder. For *every* word problem, you will use Pirate Math Equation Quest to help you find the answer, even if you think the problem is easy.

You need to practice your Pirate Math Equation Quest skills and show me how you get your answer.

Let me show you what I mean. Pirates work through a word problem like this.

Point to UPS Check² poster on the Large Schema Mat - Version 1.



Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Diana has 2 crayons. Stacy has 5 crayons. How many crayons do the girls have together?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 2; P2 = 5; T = __*
Number Sentence:	*2 + 5 = __*
Answer:	*__ = 7 crayons*

There is not a table or graph, so we are ready to follow our UPS Check^2 steps. Let's use UPS Check^2 poster now!

The letters in the word UPS, U-P-S, help you remember the steps for solving the problem. Because we have squared at the end of UPS Check, we use each letter two times. Squared means two times. What does UPS Check *squared* mean?

We use each letter two times.

Exactly! So we follow U-U-P-P-S-S-check-check. Say that with me.

U-U-P-P-S-S-check-check.

To help us remember to use UPS Check^2, let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

What do you do when you see a word problem?

Use UPS Check^2 to work through the problem.

Great, you use UPS Check^2 to work through the problem.

Now, look at this poster. Let's read the title together: "UPS Check^2." Now let's look at what each letter stands for.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read this problem together. "Diana has 2 crayons. Stacy has 5 crayons. How many crayons do the girls have together?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Remind me, what does the first U stand for?

Understand by reading.

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

We need to find out the label, or what the problem is mostly about.

What's this problem about? Is it about monkeys?

No.

Is this problem about cookies?

No.

Is this problem about crayons?

Yes.

This problem is about crayons because the question sentence asks, "How many crayons do the girls have together?" The question asks about the crayons for Diana and Stacy, so I underline the word "crayons."

Underline crayons in the question sentence.

I underlined the word "crayons" in the question (point)**. We only need to underline the word "crayons" one time. Even though we see the word "crayons" here** (point to Diana's sentence) **and here** (point to Stacy's sentence)**, you still only underline "crayons" one time.**

Should we underline the word "crayons" every time we see it in the word problem?

No.

That's right. We only underline the label one time. It doesn't really matter where you underline the word "crayons," but it's usually best to underline the label in the question sentence.

Remember, the question sentence is the sentence with a question mark at the end (point)**. A sentence always starts with a capital letter. A sentence ends with a period or a question mark.**

What does a sentence start with?

A capital letter.

What does a sentence end with?

A period or question mark.

Good. In word problems, the question sentence helps us figure out the label.

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Remind me, what does the second U stand for?

Underline the label.

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 2. 2 is about crayons, so 2 is relevant. Let's put parentheses around 2 crayons.

(Writes.)

What is our next number?

5.

Our next number is 5. 5 is about crayons, so 5 is relevant. Let's put parentheses around 5 crayons.

(Writes.)

All of the numbers in this problem are relevant because they are all about our label, crayons. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Remind me, what does the first P stand for?

Put parentheses around needed numbers.

Great! And what are needed numbers?

Numbers that are about our label.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers.

What do we need to put above needed numbers?

1.

Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed

numbers are in parentheses. What is the first number we have in parentheses?

2.

Great job! 2 crayons is in parentheses, so let's write a 1 above 2 crayons to show that 2 crayons is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

5.

Great job! 5 crayons is in parentheses, so let's write a 1 above 5 crayons to show that 5 crayons is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Remind me, what does the second P stand for?

Put the numbers in order.

Great job! Now we are ready to move on to the next step. What is the next letter you see?

S.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Schema is a fancy way of saying problem type. We will talk about four schemas during Pirate Math Equation Quest. Right now, we only know about Total problems. What problems are we talking about?

Total problems.

Yes! In Total problems, we put parts together for a total (gesture)**. What are Total problems?**

When we put parts together for a total.

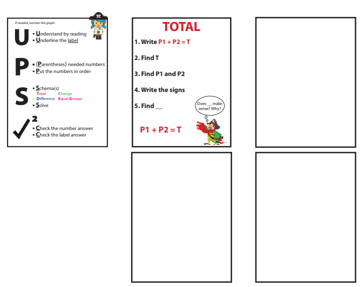
Nice! A Total problem puts parts together into a total (gesture)**. Does this problem put parts together into a total?**

Yes.

Right. This problem puts parts together into a total. This is a Total problem. To remind me it's a Total problem, I write 1-T next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. T stands for Total problem.

Write 1-T.

Display Large Schema Mat - Version 1 with Total poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Remind me, what does the first S stand for?

Schemas.

What are schemas?

Problem types.

Exactly! Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

There are five steps. Like a pirate following a treasure map, we'll follow each step to get to the treasure – the word-problem answer!

To solve a Total problem, we have five steps. Step 1. "Write P1 plus P2 is the same as T." We saw this before. This is our Total equation.

In a Total problem, parts are put together into a total (gesture)**. We add part 1 plus part 2 and that is the same as the total. Once we know the problem is a Total problem, we write our Total equation: P1 plus P2 is the same as T.** (Point.) **This helps us organize our Total work. Go ahead and write P1 plus P2 is the same as T.**

(Writes.)

Remind me again, what does P1 (point) **stand for?**

Part 1.

What does P2 (point) **stand for?**

Part 2.

What does T (point) **stand for?**

Total.

And what do we call P1 plus P2 is the same as T?

Total equation.

Very good. Look at Step 2: "Find T." What does T stand for?

The total.

That's right. We know T stands for the total because total starts with a T. In a Total problem, we have two parts, and we have a total. The question helps us figure out whether we're finding the total or one of the parts.

Look at the word problem again. The first sentence (point) **says, "Diana has 2 crayons." Diana has one part** (point to P1; then hold up that hand for Diana's part; keep that hand up)**.**

The next sentence (point) **says, "Stacy has 5 crayons." Stacy has one part.** (Point to P2 with the other hand; then hold up that hand for Stacy's part.) **The question asks, "How many crayons do the girls have together?"** (Bring together both hands and clasp together.)

We know the two parts, so the question is asking us to find the total. The missing part is the total, or T (point)**.**

In number sentences, we mark missing information with a blank. How do we mark missing information?

With a blank.

Right. T is the missing information, so we put a blank in the number sentence under T. This helps keep our work organized.

(Writes.)

Step 3: "Find P1 and P2." What do P1 and P2 stand for?

Part 1 and part 2.

Let's work on part 1, or P1. The problem (point) **says, "Diana has 2 crayons." We already underlined the word "crayons" to help us remember this problem is about crayons. Is 2 talking about crayons?**

Yes.

2 is talking about crayons. So 2 is an important number for solving the problem. Let's say Diana's crayons are part 1. What number stands for part 1?

2.

2 is part 1, or P1. I check off the 2 in the problem, like this, so I remember I've already used it. Then, I write 2 in the number sentence underneath P1, like this.

Check off 2 and write 2 underneath P1.

Now let's work on part 2, or P2. The next sentence (point) **says, "Stacy has 5 crayons." Remember, this problem is about crayons. Is 5 talking about crayons?**

Yes.

5 is talking about crayons, so it's an important number for solving the problem. We already have P1 in our number sentence (point)**. Stacy's number is part 2. What number is part 2?**

5.

5 is part 2, or P2. I check off 5, like this, to remember that I've used that number. Then I write 5 under P2 in the number sentence.

Check off 5 and write 5 underneath P2.

Now we have P1, P2, and T filled in (point to 2, 5, and blank)**. We use these numbers to find the word-problem answer!**

But before we find the answer, look at Step 4. "Write the signs."

For Total problems, our Total equation is P1 <u>plus</u> P2 is the same as T. That's why we wrote the Total equation as Step 1, right here (point)**.**

Now we know what's missing in the problem, the Total. We wrote blank here to stand for T (point)**. We found P1 and P2 in the story. We wrote those numbers, 2 and 5, underneath P1 and P2, right here** (point)**. But we still don't have any math signs. What math signs do we need to complete our number sentence?**

Plus and same as signs.

Right. We always use a plus sign in a Total problem because we add two parts together for a total. Write the plus and the same as signs in the number sentence like this.

(Writes.)

2 stands for part 1. 5 stands for part 2. Blank stands for total. Now it's time to solve this problem.

To solve this problem, we need to add 2 plus 5. What is 2 plus 5?

7.

Yes. 2 plus 5 is the same as 7. Go ahead and write 7.

(Writes.)

Good. So, what number does blank stand for in 2 plus 5 is the same as blank?

7.

Right! You said 2 plus 5 is the same as 7; so blank is the same as 7. Let's put 7 in the problem where blank is to check our work.

Write $2 + 5 = 7$ underneath $2 + 5 = \_\_$.

Write blank is the same as 7.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 7 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Crayons.

We underlined crayons, right here (point)**. Crayons is what the problem is about. It tells us about our missing information. We use the word crayons for our label. So, we write crayons after the number 7.**

Write crayons next to 7. Monitor that the student does this as well.

What is our number answer?

7.

Right. And what is our label answer?

Crayons.

Yes. Diana and Stacy have 7 crayons together. 7 is our number answer. Crayons is our label answer. 7 crayons is our final answer.

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Remind me, what does the second S stand for?

Solve.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Diana has 2 crayons. Stacy has 5 crayons. How many crayons do the girls have together?" Does it make sense that the girls have 7 crayons?

Yes.

Yes. Our answer is reasonable.

Did we answer the question, "How many crayons do the girls have together?"

Yes.

We did because we said that they had 7 crayons.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the first checkmark stand for?

Check the number answer.

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is crayons.

What word did we underline in our question sentence?

Crayons.

Exactly. We underlined crayons. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the second checkmark stand for?

Check the label answer.

Yes! Great job solving that Total problem!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Marcus sold ice cream. On the first day, Marcus made $30. On the second day, he made $25. How much money did Marcus make selling ice cream?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 30; P2 = 25; T = __*
Number Sentence:	*30 + 25 = __*
Answer:	*__ = $55*

There is not a table or graph, so we are ready to follow our UPS Check² steps. Whenever we see a word problem, we use the UPS Check² poster to help us solve it. Let's use UPS Check² poster now!

The letters in the word UPS, U-P-S, help you remember the steps for solving the problem. Because we have squared at the end of UPS Check, we use each letter two times. Squared means two times. What does UPS Check *squared* mean?

We use each letter two times.

Exactly! So we follow U-U-P-P-S-S-check-check. Say that with me.

U-U-P-P-S-S-check-check.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

What do you do when you see a word problem?

Use UPS Check^2 to work through the problem.

Great, you use UPS Check^2 to work through the problem.

Now, look at this poster. Let's read the title together: "UPS Check^2 ." Now let's look at what each letter stands for.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read the problem together. "Marcus sold ice cream. On the first day, Marcus made $30. On the second day, he made $25. How much money did Marcus make selling ice cream?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Remind me, what does the first U stand for?

Understand by reading.

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

We need to find out the label, or what the problem is mostly about. Where do we look for our label?

In the question sentence.

Right! We find our label in the question sentence, or the sentence that starts with a capital letter and ends with a question mark. Our question sentence says, "How much money did Marcus make selling ice cream?"

What's this problem about?

Money.

Right! The problem is talking about the money Marcus made selling ice cream. Let's underline money.

Now, would we write 5 money as an answer?

No.

You're right. That doesn't make sense. When we are talking about money, we are usually talking about dollars or cents. Let's look at our numbers. What kind of money are we talking about?

Dollars.

This problem is about dollars, so let's write dollars or write a $ under money.

Underline money in the question sentence and write dollars or $ below.

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Remind me, what does the second U stand for?

Underline the label.

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 30. 30 is about dollars, so 30 is relevant. Let's put parentheses around $30.

(Writes.)

What is our next number?

25.

Our next number is 25. 25 is about dollars, so 25 is relevant. Let's put parentheses around $25.

(Writes.)

All of the numbers in this problem are relevant because they are all about our label, dollars. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Remind me, what does the first P stand for?

Put parentheses around needed numbers.

Great! And what are needed numbers?

Numbers that are about our label.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to

put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers.

What do we need to put above needed numbers?

1.

Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed numbers are in parentheses. What is the first number we have in parentheses?

30.

Great job! $30 is in parentheses, so let's write a 1 above $30 to show that $30 is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

$25.

Great job! $25 is in parentheses, so let's write a 1 above $25 to show that $25 is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Remind me, what does the second P stand for?

Put the numbers in order.

Great job! Now we are ready to move on to the next step. What is the next letter you see?

S.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Schema is a fancy way of saying problem type. We will talk about four problem types during Pirate Math Equation Quest. Right now, we only know about Total problems. What problems are we talking about?

Total problems.

Yes! In Total problems, we put parts together for a total (gesture)**. What are Total problems?**

When we put parts together for a total.

Nice! A Total problem puts parts together into a total (gesture)**. Does this problem put parts together into a total?**

Yes.

Right. In this problem, the money Marcus made on the first day is part 1 (raise one hand)**. The money Marcus made on the second day is part 2** (raise other hand)**.**

I put two parts together into a <u>total</u> (clasp hands)**. I put part 1, the money Marcus made on the first day, together with part 2, the money Marcus made on the second day.**

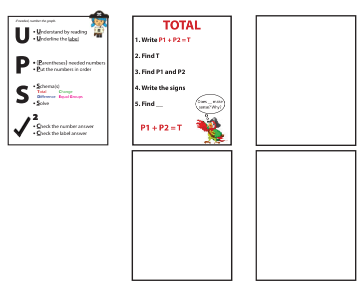
Why is this a Total problem?

(Responds with gesturing.)

This problem puts parts together into a total. This is a Total problem. To remind me it's a Total problem, I write 1-T next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. T stands for Total problem.

Write 1-T.

Display Large Schema Mat - Version 1 with Total poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Remind me, what does the first S stand for?

Schemas.

What are schemas?

Problem types.

Exactly! Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

There are five steps. Like a pirate following a treasure map, we'll follow each step to get to the treasure – the word-problem answer!

To solve a Total problem, we have five steps. Step 1. "Write P1 plus P2 is the same as T." We saw this before. This is our Total equation.

In a Total problem, parts are put together into a total (gesture)**. We add part 1 plus part 2 and that is the same as the total. Once we know the problem is a Total problem, we write our Total equation: P1 plus P2 is the same as T.** (Point.) **This helps us organize our Total work. Go ahead and write P1 plus P2 is the same as T.**

(Writes.)

Remind me again, what does P1 (point) **stand for?**

Part 1.

What does P2 (point) **stand for?**

Part 2.

What does T (point) **stand for?**

Total.

And what do we call P1 plus P2 is the same as T?

Total equation.

Very good. Look at Step 2: "Find T." What does T stand for?

The total.

That's right. We know T stands for the total because total starts with a T. In a Total problem, we have two parts, and we have a total. The question helps us figure out whether we're finding the total or one of the parts.

Look at the word problem again. The second sentence (point) **says, "On the first day, Marcus made $30." The first part is the amount of money Marcus made on the first day** (point to P1; keep that hand up)**.**

The next sentence (point) **says, "On the second day, he made $25."** (Point to P2 with the other hand; then hold up that hand.) **The question asks, "How much money did Marcus make selling ice cream?"** (Bring together both hands and clasp together.)

We know the two parts, so the question is asking us to find the total. The missing part is the total, or T (point)**.**

In number sentences, we mark missing information with a blank. How do we mark missing information?

With a blank.

Right. T is the missing information, so we put a blank in the number sentence under T. This helps keep our work organized.

(Writes.)

Step 3: "Find P1 and P2." What do P1 and P2 stand for?

Part 1 and part 2.

Let's work on part 1, or P1. The problem (point) **says, "On the first day, Marcus made $30." Let's say the amount of money Marcus made on the first day is part 1. What number stands for part 1?**

30.

30 is part 1, or P1. I check off the 30 in the problem, like this, so I remember

I've already used it. Then, I write 30 in the number sentence underneath P1, like this.

Check off 30 and write 30 underneath P1.

Now let's work on part 2, or P2. The next sentence (point) **says, "On the second day, he made $25." We already have P1 in our number sentence** (point)**. What number is part 2?**

25.

25 is part 2, or P2. I check off 25, like this, to remember that I've used that number. Then I write 25 under P2 in the number sentence.

Check off 25 and write 25 underneath P2.

Now we have P1, P2, and T filled in (point to 30, 25, and blank)**. We use these numbers to find the word-problem answer!**

But before we find the answer, look at Step 4. "Write the signs."

For Total problems, our Total equation is P1 <u>plus</u> P2 is the same as T. That's why we wrote the Total equation as Step 1, right here (point)**.**

Now we know what's missing in the problem, the total. We wrote blank here to stand for T (point)**. We found P1 and P2 in the story. We wrote those numbers, 30 and 25, underneath P1 and P2, right here** (point)**. But we still don't have any math signs. What math signs do we need to complete our number sentence?**

Plus and the same as signs.

Right. We always use a plus sign in a Total problem because we add two parts together for a total. Write the plus and the same as signs in the number sentence like this.

(Writes.)

30 stands for part 1. 25 stands for part 2. Blank stands for total. Now it's time to solve this problem.

To solve this problem, we need to add 30 plus 25. What is 30 plus 25?

55.

Yes. 30 plus 25 is the same as 55. Go ahead and write 55.

(Writes.)

Good. So, what number does blank stand for in 30 plus 25 is the same as blank?

55.

Right! You said 30 plus 25 is the same as 55; so blank is the same as 55. Let's put 55 in the problem where blank is to check our work.

Write $30 + 25 = 55$ underneath $30 + 25 =$ ___.

Write blank is the same as 55.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 55 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Dollars.

We underlined dollars, right here (point)**. Dollars is what the problem is about. It tells us about our missing information. We use the word dollars for our label. So, we write dollars after the number 55.**

Write dollars next to 55. Monitor that the student does this as well.

What is our number answer?

55.

Right. And what is our label answer?

Dollars.

Yes. 55 is our number answer. Dollars is our label answer. 55 dollars is our final answer.

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Remind me, what does the second S stand for?

Solve.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense.

Is our answer reasonable?

Yes.

Did we answer the question, "How much money did Marcus make selling ice cream?"

Yes.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the first checkmark stand for?

Check the number answer.

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is dollars.

What word did we underline in our question sentence?

Dollars.

Exactly. We underlined dollars. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the second checkmark stand for?

Check the label answer.

Yes! Great job solving that Total problem! That was a lot to learn today. Let's review.

What's a Total problem?

When parts are put together into a total.

Good. A Total problem is when parts are put together into a total.

When you see a word problem, what's the first thing you do? (Point to UPS Check^2 poster.)

Use the UPS Check^2 poster to solve the problem.

Good. What does U stand for?

Understand by reading and underline the label.

P?

Put parentheses around needed numbers and put the numbers in order.

S?

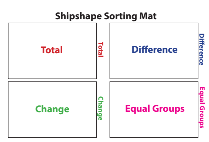
Schemas and solve.

Checkmark?

Check the number answer and label answer.

You earn a treasure coin!

4: Shipshape Sorting



Each day, we'll play Shipshape Sorting.

Display Sorting Cards.
Display Sorting Mat.

I'll show these cards. On each sorting card, there's a word problem. I'll read the problem out loud. Your job is to decide what type of problem it is, and sort it on this mat (point)**. You don't solve the problem, you just decide what type of problem it is.**

So far, we've learned about Total problems, so you'll only use the Total box (point)**. If you think the problem is a Total problem, put the card here** (point)**. If it's NOT a Total problem, put the card to the side of the mat** (point)**.**

You'll have 2 minutes to listen to as many problem as you can and sort them in the correct boxes. Do you have any questions?

Begin.

Great! You did a nice job with the sorting. Let's see how many are correct.

Go through cards (answers on back of each card).
Review up to 3 incorrect cards, and once you have introduced all four schemas, you can say:

Look at the question. Does the word problem tell a story about two or more amounts combined for a total? Does the word problem tell a story about two amounts being compared? Does the word problem tell a story about an amount that increases or decreases? Or does the word problem tell a story about groups with an equal number in each group?

(Responds.)

Affirm correct response.
Review incorrect response.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

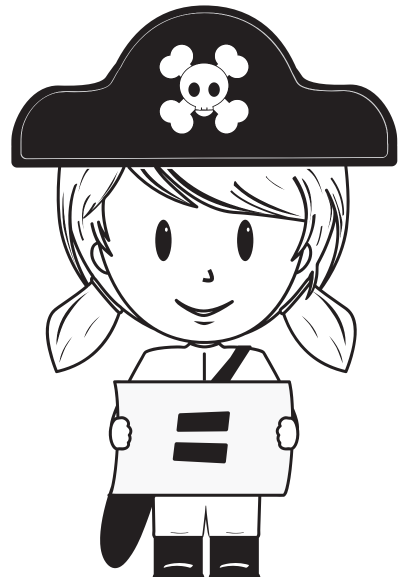
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 4

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total with three and four parts
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 4
Buccaneer Problems: Lesson 4
Jolly Roger Review: Lesson 4
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Let's look at some number sentences. We'll read each sentence. When you see the equal sign, remember to say *the same as*.

Point to A.

This number sentence says, 6 plus 8 is *the same as* (point to =) **14. Let's say that together.**

6 plus 8 is the same as 14.

Let's read it again.

6 plus 8 is the same as 14.

Point to B.

Now, this number sentence looks a little different. We'll read it from left (point) **to right** (point)**. 11 is *the same as*** (point to =) **5 plus 6. Let's say that together.**

11 is the same as 5 plus 6.

Yes. 11 is the same as (point to =) **5 plus 6.**

Point to C.

Let's read this number sentence.

13 minus 4 is the same as 9.

Great. 13 minus 4 is *the same as* 9.

Point to D.

Let's read this number sentence.

72 minus 10 is the same as 62.

Great. 72 minus 10 is *the same as* 62.

Point to E.

Try this number sentence. Remember, the equal sign means *the same as*.

12 is the same as 23 minus 11.

Yes. 12 is the same as (point to =) **23 minus 11.**

It doesn't matter where the equal sign is in a number sentence. Whenever you see the equal sign, you say *the same as*. What do you say?

The same as.

Great! We'll practice this more next time!

3: Buccaneer Problems

We've recently started talking about Total problems. What's a Total problem?

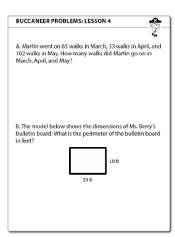
When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. Now, sometimes Total problems can have *more* than two parts! And that's okay. It's still a Total problem, and we can still use the Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total. But when we have three parts, we can change the Total equation to P1 plus P2 plus P3 is the same as T. When we have four parts, we can change the Total equation to P1 plus P2 plus P3 plus P4 is the same as T. Let me show you how this works!

Point to A.


BUCCANEER PROBLEMS: LESSON 4

A. Martin went on 65 walks in March, 33 walks in April, and 102 walks in May. How many walks did Martin go on in March, April, and May?

B. The model below shows the dimensions of Ms. Berry's bulletin board. What is the perimeter of the bulletin board in feet?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

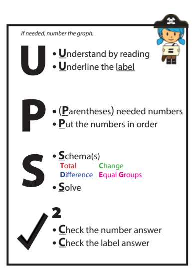
<u>Solution to Problem A:</u>

> *Martin went on 65 walks in March, 33 walks in April, and 102 walks in May. How many walks did Martin go on in March, April, and May?*

Problem Type:	*Total, three parts*
Relevant Information:	*P1 = 65; P2 = 33; P3 = 102; T = ___*
Number Sentence:	*65 + 33 + 102 = ___*
Answer:	*___ = 200 walks*

There is not a table or graph, so we are ready to follow our UPS Check² steps. Let's use UPS Check² poster now!

Point to UPS Check² poster on the Large Schema Mat - Version 1.



To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read the problem together. "Martin went on 65 walks in March, 33 walks in April, and 102 walks in May. How many walks did Martin go on in March, April, and May?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Remind me, what does the first U stand for?

Understand by reading.

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help us label the answer later.

We need to find out the label, or what the problem is mostly about. What is our label?

(Responds.)

Exactly! Our label is walks. Let's underline walks in our question sentence.

Underline walks in the question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Remind me, what does the second U stand for?

Underline the label.

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 65. 65 is about walks, so 65 is relevant. Let's put parentheses around 65 walks.

(Writes.)

What is our next number?

33.

Our next number is 33. 33 is about walks, so 33 is relevant. Let's put parentheses around 33 walks.

(Writes.)

Do we have any other numbers?

(Responds.)

Yes! What is our last number?

102.

Our last number is 102. 102 is about walks, so 102 is relevant. Let's put parentheses around 102 walks.

All of the numbers in this problem are relevant because they are all about our label, walks. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Remind me, what does the first P stand for?

Put parentheses around needed numbers.

Great! And what are needed numbers?

Numbers that are about our label.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers.

What do we need to put above needed numbers?

1.

Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed numbers are in parentheses. What is the first number we have in parentheses?

65 walks.

Great job! 65 walks is in parentheses, so let's write a 1 above 65 walks to show that 65 walks is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

33 walks.

Great job! 33 walks is in parentheses, so let's write a 1 above 33 walks to show that 33 walks is involved in the first step of solving our problem.

(Writes.)

What is the third number we have in parentheses?

102 walks.

Great job! 102 walks is in parentheses, so let's write a 1 above 102 walks to show that 102 walks is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Remind me, what does the second P stand for?

Put the numbers in order.

Great job! Now we are ready to move on to the next step. What is the next letter you see?

S.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Schema is a fancy way of saying problem type. We will talk about four problem types during Pirate Math Equation Quest. Right now, we only know about Total problems. What problems are we talking about?

Total problems.

Yes! In Total problems, we put parts together for a total (gesture)**. What are Total problems?**

When we put parts together for a total.

Nice! A Total problem puts parts together into a total (gesture)**. Does this problem put parts together into a total?**

Yes.

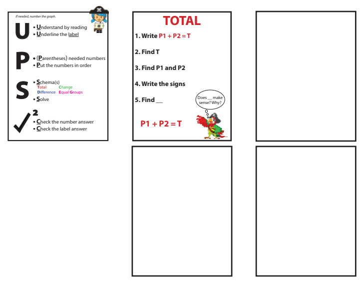
Nice! In this problem, we need to find the total number of walks. To find the total number of walks, we add the total number of walks Martin went on in March, April, and May (gesture)**.**

To remind me it's a Total problem, I write 1-T next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. T stands for Total

problem.

Write 1-T.

Display Large Schema Mat - Version 1 with Total poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Remind me, what does the first S stand for?

Schemas.

What are schemas?

Problem types.

Exactly! Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

There are five steps. Like a pirate following a treasure map, we'll follow each step to get to the treasure – the word-problem answer!

To solve a Total problem, we have five steps. What's Step 1?

Write P1 + P2 = T.

Good. We write the Total equation: P1 plus P2 is the same as T. In a Total problem, two or more parts are put together for a total. The Total equation, P1 plus P2 is the same as T, helps us remember how to write our number sentence for a Total problem.

(Writes.)

Step 2: "Find T." Let's first look at the question to see if the problem tells us the total or if the problem asks us to find the total.

The question says, "How many walks did Martin go on in March, April, and May?" Is the question asking us to find the total number of walks?

Yes.

If the question is asking us to find the total number of walks, what is missing? The total or one of the parts?

The total.

Right. The missing information asks about the total number of walks. We know the missing information is the total. We need to find the total, or T. That's what's missing.

In number sentences, how do we mark missing information?

With a blank.

Right. T is the missing information, so we put a blank in the number sentence under T. This helps keep our work organized.

(Writes.)

Step 3: "Find P1 and P2." We need to think about the story and figure out what numbers P1 and P2 are. Remember, the total is the number of walks in March, April, and May. If we're putting together the walks, we want to find the numbers that tell about walks. Those will be part 1 and part 2.

Which numbers are about walks? Let's look at the first number in parentheses.

It says "65 walks." Is this about walks?

Yes.

Good. That's P1. Check off the 65 in the problem and write the number 65 in the number sentence underneath P1.

Check off 65 and write 65 underneath P1.

Let's look at the next number in parentheses. It says "33 walks." Is this about walks?

Yes.

Good. That's P2. Check off the 33 in the problem and write the number 33 in the number sentence underneath P2.

Check off 33 and write 33 underneath P2.

Let's look at the next number. It says "102 walks." Is this about walks?

Yes.

Do we have a place to put the 102 in the Total equation?

No.

You're right! In this Total problem, we're putting together 3 parts instead of 2 parts! The question asks, "How many walks did Martin go on in March, April, and May?" The first part is 65 walks, the second part is 33 walks, and the third part is 102 walks. To answer the question we need to put all 3 walks together.

In Total problems, we can have more than two parts! Let's add one more part to the Total equation.

Write P3 at the beginning of our Total equation and an extra plus sign. We need 3 because we're adding a third part to the Total equation.

(Writes.)

Work should look like this:

P3 + P1 + P2 = T
65   33 = __

Now, what's P3?

102.

Good. That's P3. Check off the 102 in the problem and write the number 102 in the number sentence underneath P3.

Check off 102 and write 102 underneath P3.

Sometimes Total problems put 3 parts together to find the total. We still name these problems Total problems because we're still putting parts together.

Now let's go to Step 4. What's Step 4?

Write the signs.

Good. What math signs do we need to complete our number sentence?

+, +, and =.

Right. We need two plus signs and the same as sign. Let's write them in the number sentence.

(Writes.)

102 stands for part 3. 33 stands for part 2. 65 stands for part 1. Blank stands for the total. Does this look like a number sentence we know how to solve?

Yes.

Don't let the number sentence trick you. Blank is at the end. We're going to add to find blank.

Do you add or subtract?

Add.

That's right. All we need to do is add P1 plus P2 plus P3 to find T.

(Add.)

What's the sum? Use Counting Up if needed.

200.

Great! Our sum is 200.

Whenever we write an answer to a word problem, we need a number and a label. We know that 200 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Walks.

We underlined walks, right here (point)**. Walks is what the problem is about. It tells us about our missing information. We use the word walks for our label. So, we write walks after the number 200.**

Write walks next to 200. Monitor that the student does this as well.

What is our number answer?

200.

Right. And what is our label answer?

Walks.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Remind me, what does the second S stand for?

Solve.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "How many walks did Martin go on in March, April, and May?" Does it make sense that the sum is 200 walks?

Yes.

Yes. Our answer is reasonable.

Did we answer the question, "How many walks did Martin go on in March, April, and May?"

Yes.

Exactly! Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the first checkmark stand for?

Check the number answer.

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is walks.

What word did we underline in our question sentence?

Walks.

Exactly. We underlined walks. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the second checkmark stand for?

Check the label answer.

Yes! Great job solving that Total problem! Let's try another one!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No. But there is a figure.

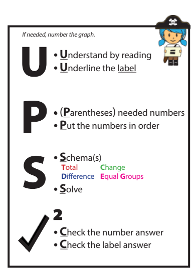
Exactly. There is a figure with some numbers, so we will need to use this figure to solve our problem. We are ready to follow our UPS Check^2 steps. Let's use UPS Check^2 poster now!

<u>*Solution to Problem B:*</u>

The model below shows the dimensions of Ms. Berry's bulletin board. What is the perimeter of the bulletin board in feet?

Problem Type:	*Total, four parts*
Relevant Information:	*P1 = 20; P2 = 10; P3 = 20; P4 = 10; T = __*
Number Sentence:	*20 + 10 + 20 + 10 = __*
Answer:	*__ = 60 feet*

Point to UPS Check^2 poster on the Large Schema Mat - Version 1.



To help us remember to use UPS Check^2, let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read the problem together. "The model below shows the dimensions of Ms. Berry's bulletin board. What is the perimeter of the bulletin board in feet?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Remind me, what does the first U stand for?

Understand by reading.

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

We need to find out the label, or what the problem is mostly about.

(Responds.)

This problem is talking about the perimeter. Have you seen the word "perimeter" before?

(Responds.)

Do you know what it means to find the perimeter?

(Responds.)

When we find the perimeter, we are finding the distance around a figure. We can find the perimeter of a figure by adding all of the sides together.

What does permiter mean?

The distance around a figure.

Exactly! And how can we find the perimeter?

By adding all of the sides together.

Nice! Now let's go back to our label. Our question is asking us to find the perimeter, so let's underline the word perimeter.

Underline perimeter in the question sentence.

Now we don't write an answer as 5 perimeter or 6 perimeter. We have to figure out how we are measuring the perimeter. The easiest way to figure out how we are measuring the perimeter is to look at the numbers.

What measurement do you see next to the numbers in the figure (point)**?**

Feet.

Exactly! Also, the question sentence says, "What is the perimeter of the bulletin board in feet?" We are measuring the perimeter in feet, so let's write feet under perimeter so we remember that our label is feet.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Remind me, what does the second U stand for?

Underline the label.

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check our problem. Do you see any numbers in our problem?

No.

Where do you see the numbers?

(Responds.)

Exactly! Our numbers are not in our problem. Our numbers are in the figure (point)**! What do you notice about this figure?**

It's a rectangle.

Exactly! Are there numbers on all four sides?

No.

Good thinking! Only two of the sides of the rectangle have numbers. This means we need to find the numbers for the other two sides. In rectangles, opposite sides are the same length. If this side (point) **is 10 feet, what is this side** (point to the left side of the rectangle)**?**

10 feet.

Great! Go ahead and write 10 feet or ft. on the left side of the rectangle.

(Writes.)

Now remember, in a rectangle, opposite sides are the same length. If this side (point) **is 20 feet, what is this side** (point to the top of the rectangle)**?**

20 feet.

Great! Go ahead and write 20 feet or ft. on the top of the rectangle.

(Writes.)

Now that we have our numbers, we can put parentheses around the needed numbers. Remember, needed numbers are numbers about our label.

Remind me, what is our label?

Feet.

Good! What's our first number?

20.

20 is about feet, so 20 is relevant. Let's put parentheses around 20 ft.

(Writes.)

What is our next number?

10.

Our next number is 10. 10 is about feet, so 10 is relevant. Let's put parentheses around 10 ft.

(Writes.)

What's our next number?

20.

20 is about feet, so 20 is relevant. Let's put parentheses around 20 ft.

(Writes.)

Good! What's our last number?

10.

10 is about feet, so 10 is relevant. Let's put parentheses around 10 ft.

(Writes.)

All of the numbers in this problem are relevant because they are all about our label, feet. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Remind me, what does the first P stand for?

Put parentheses around needed numbers.

Great! And what are needed numbers?

Numbers that are about our label.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers.

What do we need to put above needed numbers?

1.

Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed numbers are in parentheses. What is the first number we have in parentheses?

20 feet.

Great job! 20 feet is in parentheses, so let's write a 1 above 20 feet to show that 20 feet is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

10 feet.

Great job! 10 feet is in parentheses, so let's write a 1 above 10 feet to show that 10 feet is involved in the first step of solving our problem.

(Writes.)

What is the third number we have in parentheses?

20 feet.

Great job! 20 feet is in parentheses, so let's write a 1 above 20 feet to show that 20 feet is involved in the first step of solving our problem.

(Writes.)

What is the last number we have in parentheses?

10 feet.

Great job! 10 feet is in parentheses, so let's write a 1 above 10 feet to show that 10 feet is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Remind me, what does the second P stand for?

Put the numbers in order.

Great job! Now we are ready to move on to the next step. What is the next letter you see?

S.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Schema is a fancy way of saying problem type. We will talk about four problem types during Pirate Math Equation Quest. Right now, we only know about Total problems. What problems are we talking about?

Total problems.

Yes! In Total problems, we put parts together for a total (gesture)**. What are Total problems?**

When we put parts together for a total.

Nice! A Total problem puts parts together into a total (gesture)**. Does this problem put parts together into a total?**

Yes.

Nice! In this problem, we need to find the perimeter. To find the perimeter, we add all of the sides together, or parts of the rectangle together, to find the total (gesture)**.**

Remind me again, how to we find the perimeter?

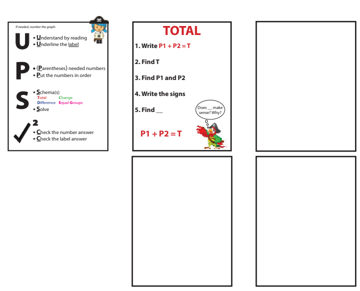
By adding all of the sides together.

Nice! This problem asks us to find the perimeter. Whenever we find the perimeter, we puts parts, the sides, together for a total (gesture)**. Whenever a question asks us about the perimeter, we know we have a Total problem.**

To remind me it's a Total problem, I write 1-T next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. T stands for Total problem.

Write 1-T.

Display Large Schema Mat - Version 1 with Total poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Remind me, what does the first S stand for?

Schemas.

What are schemas?

Problem types.

Exactly! Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

There are five steps. Like a pirate following a treasure map, we'll follow each step to get to the treasure – the word-problem answer!

To solve a Total problem, we have five steps. What's Step 1?

Write P1 + P2 = T.

Good. We write the Total equation: P1 plus P2 is the same as T. In a Total problem, two or more parts are put together for a total. The Total equation, P1 plus P2 is the same as T, helps us remember how to write our number sentence for a Total problem.

(Writes.)

Step 2: "Find T." Let's first look at the question to see if the problem tells us the total or if the problem asks us to find the total.

The question says, "What is the perimeter of the bulletin board in feet?" Is the question asking us to find the total number of feet?

Yes.

If the question is asking us to find the total number of feet, the perimeter, what is missing? The total or one of the parts?

The total.

Right. The missing information asks about the perimeter of the rectangle. We know the missing information is the total. We need to find the total, or T. That's what's missing.

In number sentences, how do we mark missing information?

With a blank.

Right. T is the missing information, so we put a blank in the number sentence under T. This helps keep our work organized.

(Writes.)

Step 3: "Find P1 and P2." We need to think about the story and figure out what numbers P1 and P2 are. Remember, the total is the perimeter, or the total number of feet for all four sides of the rectangle. If we're putting together feet, we want to find the numbers that tell about feet. Those will be part 1 and part 2.

Which numbers are about feet? Let's look at the first number in parentheses. It says "20 feet." Is this about feet?

Yes.

Good. That's P1. Check off the 20 in the rectangle and write the number 20 in the number sentence underneath P1.

Check off 20 and write 20 underneath P1.

Let's look at the next number in our rectangle. It says "10 feet." Is this about feet?

Yes.

Good. That's P2. Check off the 10 in the rectangle and write the number 10 in the number sentence underneath P2.

Check off 10 and write 10 underneath P2.

Let's look at the next number. It says "20 feet." Is this about feet?

Yes.

Let's look at the last number. It says "10 feet." Is this about feet?

Yes.

Do we have a place to put the 20 and 10 in the Total equation?

No.

You're right! In this Total problem, we're putting together 4 parts instead of 2 parts! The question asks, "What is the perimeter of the bulletin board in feet?" The first side of the rectangle is 20 feet, the second side is 10 feet, the third side is 20 feet, and the fourth side is 10 feet. To answer the question we need to put all 4 sides together.

In Total problems, we can have more than two parts! Let's add two more parts to the Total equation.

Write P4 and P3 at the beginning of our Total equation and write two extra plus signs. We need P4 and P3 because we're adding a third part and a fourth part to the Total equation.

(Writes.)

Work should look like this:

$$
\begin{array}{ccccccccc}
P4 & + & P3 & + & P1 & + & P2 & = & T \\
 & & & & 20 & & 10 & = & \_\_
\end{array}
$$

Now, what's P3?

20.

Good. That's P3. Check off the 20 in the rectangle and write the number 20 in the number sentence underneath P3.

Check off 20 and write 20 underneath P3.

Now, what's P4?

10.

Good. That's P4. Check off the 10 in the rectangle and write the number 10 in the number sentence underneath P4.

Check off 10 and write 10 underneath P4.

Sometimes Total problems put 3 or 4 parts together to find the total. We still name these problems Total problems because we're still putting parts together.

Now let's go to Step 4. What's Step 4?

Write the signs.

Good. What math signs do we need to complete our number sentence?

+, +, +, and =.

Right. We need three plus signs and the same as sign. Let's write them in the number sentence.

(Writes.)

10 stands for part 4. 20 stands for part 3. 10 stands for part 2. 20 stands for part 1. Blank stands for the total. Does this look like a number sentence we know how to solve?

Yes.

Don't let the number sentence trick you. Blank is at the end. We're going to add to find blank.

Do you add or subtract?

Add.

That's right. All we need to do is add P1 plus P2 plus P3 plus P4 to find T.

(Add.)

What's the sum? Use Counting Up if needed.

60.

Great! Our sum is 60.

Whenever we write an answer to a word problem, we need a number and a label. We know that 60 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Feet.

We underlined feet, right here (point)**. Feet is what the problem is about. It tells us about our missing information. We use the word feet for our label. So, we write feet after the number 60.**

Write feet next to 60. Monitor that the student does this as well.

What is our number answer?

60.

Right. And what is our label answer?

Feet.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Remind me, what does the second S stand for?

Solve.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "What is the perimeter of the bulletin board in feet?" Does it make sense that the perimeter is 60 feet?

Yes.

Yes. Our answer is reasonable.

Did we answer the question, "What is the perimeter of the bulletin board in feet?"

Yes.

We did because we find the perimeter by adding all of the sides together. How do we find the perimeter of a figure?

By adding all of the sides.

Exactly! Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the first checkmark stand for?

Check the number answer.

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is feet.

What word did we underline in our question sentence?

Feet.

Exactly. We underlined feet. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the second checkmark stand for?

Check the label answer.

Yes! Great job solving that Total problem! Let's try another one!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right! We have a table, but the table already is numbered for us. This means we can follow the steps on our UPS Check^2 poster.

Solution to Problem C:

The table shows the chores Kavon did on Saturday morning and the amount of time he spent on each chore. How much time did Kavon spend raking the yard, cleaning tools, and sweeping the garage?

Problem Type:	*Total, three parts*
Relevant Information:	*P1 = 55; P2 = 35; P3 = 40; T = __*
Irrelevant Information:	~~*Washing the car; Weeding the garden*~~
Number Sentence:	*55 + 35 + 40 = __*
Answer:	*__ = 130 minutes*

Follow the step-by-step dialogue for Problem A.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

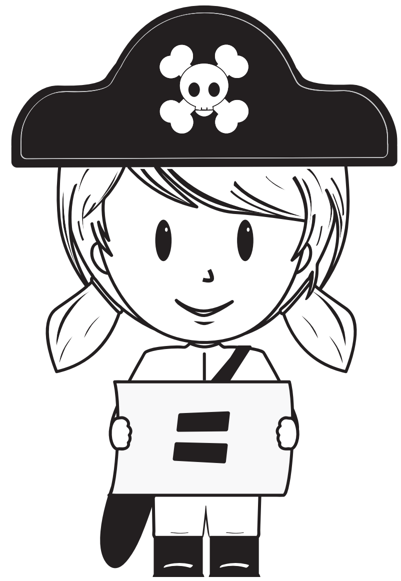
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 5

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total with part missing
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 5
Buccaneer Problems: Lesson 5
Jolly Roger Review: Lesson 5
Cubes
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Look at A.

Point to A.

4 plus 6 is *the same as* blank.

To solve this problem with cubes, we can place 4 cubes (place 4 cubes of one color) **and 6 cubes** (place 6 cubes of another color) **on this side of the equal sign.**

Place 4 cubes and 6 cubes in left box.

Now, the equal sign acts as a balance. We need to make these sides the same. How many cubes do we have on this side (point to left box)**? Add the 4 cubes and 6 cubes.**

10.

So, if we have 10 cubes on this side of the equal sign (point)**, how many cubes do we need on that side** (point)**?**

10.

That's right. To make the sides the same, we need 10 cubes. Let's add different colored cubes so we can see how many we added. Place 10 cubes.

Place 10 cubes in right box.

Okay, let's check that this side (point) **is the same as that side** (point)**. On this side of the equal sign** (point to left)**, there are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 cubes** (touch each cube)**.**

On that side of the equal sign (point to right)**, there are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 cubes** (touch each cube)**. Is this side** (point to left) **the same as that side** (point to right)**?**

Yes.

Yes! The two sides are the same. 4 plus 6 is the same as 10. Go ahead and write 10.

(Writes 10.)

What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as*.

Let's try another one.

Point to B.

This problem says blank is *the same as* 3 plus 5. Let's read that together.

Blank is the same as 3 plus 5.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

To solve this problem with cubes, place 3 cubes on that side (point to right box) **of the mat.**

Place 3 cubes in right box.

Now, add 5 cubes to that side of the equal sign (point to right box)**.**

Place 5 cubes in right box.

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point to left) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 8 cubes on this side of the equal sign (point)**, and 8 cubes on that side of the equal sign** (point)**.**

So, what is *the same as* 3 plus 5?

8.

That's right. You placed 8 cubes on this side (point)**. So, 8 is *the same as* 3 plus 5. Go ahead and write 8.**

(Writes.)

Let's read the number sentence together.

8 is the same as 3 plus 5.

What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as*.

Good work for today! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**. We'll practice this more next time!**

3: Buccaneer Problems

We've recently started talking about Total problems. What's a Total problem?

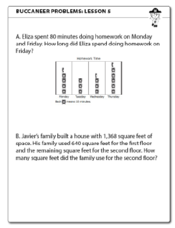
When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. Now, sometimes Total problems have two parts and other times Total problems have *more* than two parts! And that's okay. It's still a Total problem, and we can still use the Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total. We have talked about problems where the total is the missing information. Today, we are going to learn about Total problems where the missing information is one of the parts. Let me show you what I mean.

Point to A.


BUCCANEER PROBLEMS: LESSON 5

A. Eliza spent 80 minutes doing homework on Monday and Friday. How long did Eliza spend doing homework on Friday?

Homework Time

Monday Tuesday Wednesday Thursday

Each means 10 minutes.

B. Javier's family built a house with 1,368 square feet of space. His family used 640 square feet for the first floor and the remaining square feet for the second floor. How many square feet did the family use for the second floor?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

What should we do?

Number it.

Exactly! Let's read the special directions, also called the key, below the graph. What does it say?

(Responds.)

It says each clock means 10 minutes. This means we need to count by tens.

What should we do?

Count by tens.

Do you see how some of the clocks (point) **are half clocks?**

(Responds.)

For the half clocks, we need to count by fives because half of ten is five. What do we need to do for the half clocks?

Count by five.

Great! Let's go ahead and number the graph.

(Numbers.)

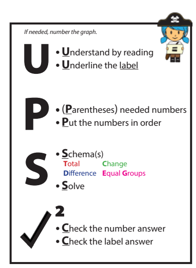
<u>Solution to Problem A:</u>

Eliza spent 80 minutes doing homework on Monday and Friday. How long did Eliza spend doing homework on Friday?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 45; P2 = ___; T = 80*
Irrelevant Information:	~~*Tuesday, Wednesday, Thursday*~~
Number Sentence:	*45 + ___ = 80*
Answer:	*___ = 35 minutes*

Now that we have numbered the graph, we are ready to follow our UPS Check^2 steps. Let's use UPS Check^2 poster now!

Point to UPS Check^2 poster on the Large Schema Mat - Version 1.



To help us remember to use UPS Check^2, let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read the problem together. "Eliza spent 80 minutes doing homework on Monday and Friday. How long did Eliza spend doing homework on Friday?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Remind me, what does the first U stand for?

Understand by reading.

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

We need to find out the label, or what the problem is mostly about.

(Responds.)

This problem is talking about the minutes Eliza spent doing homework, so let's underline the word minutes.

Underline minutes in the first sentence or underline long and write minutes underneath in the question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed

that step.

(Writes.)

Remind me, what does the second U stand for?

Underline the label.

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check our problem. What's our first number?

80.

80 is about the minutes Eliza spent doing homework on Monday and Friday. We care about the minutes on Monday and Friday, so 80 is relevant. Let's put parentheses around 80 minutes.

(Writes.)

What is our next number? Look at the numbers you wrote in the graph.

45.

Our next number is 45. 45 is about the minutes Eliza spent doing homework on Monday. We care about the minutes on Monday and Friday, so 45 is relevant. Let's put parentheses around 45 minutes.

(Writes.)

What's our next number?

30.

30 is about minutes, but look carefully! The question asks us how many minutes Eliza spent doing homework on *Monday* and *Friday*. Do we need to know how many minutes Eliza spent doing homework on *Tuesday*?

No.

You're right! 30 minutes is irrelevant. We do not need the number, so let's cross out 30 minutes in our graph.

(Crosses out.)

What's our next number?

35.

35 is about minutes, but look carefully! The question asks us how many minutes Eliza spent doing homework on *Monday* and *Friday*. Do we need to know how many minutes Eliza spent doing homework on *Wednesday*?

No.

You're right! 35 minutes is irrelevant. We do not need the number, so let's cross out 35 minutes in our graph.

(Crosses out.)

What's our last number?

55.

55 is about minutes, but look carefully! The question asks us how many minutes Eliza spent doing homework on *Monday* and *Friday*. Do we need to know how many minutes Eliza spent doing homework on *Thursday*?

No.

You're right! 55 minutes is irrelevant. We do not need the number, so let's cross out 55 minutes in our graph.

(Crosses out.)

In this problem, we had irrelevant information. Even though there were numbers that were about our label, minutes, they were not about minutes on *Monday* and *Friday.* We have to look very carefully when we solve word problems to only put parentheses around the numbers we need. If we do not need the numbers, we need to cross them out like we did here.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Remind me, what does the first P stand for?

Put parentheses around needed numbers.

Great! And what are needed numbers?

Numbers that are about our label.

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers.

What do we need to put above needed numbers?

1.

Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed numbers are in parentheses. What is the first number we have in parentheses?

80 minutes.

Great job! 80 minutes is in parentheses, so let's write a 1 above 80 minutes to show that 80 minutes is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

45 minutes.

Great job! 45 minutes is in parentheses, so let's write a 1 above 45 minutes to show that 45 minutes is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Remind me, what does the second P stand for?

Put the numbers in order.

Great job! Now we are ready to move on to the next step. What is the next letter you see?

S.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Schema is a fancy way of saying problem type. We will talk about four problem types during Pirate Math Equation Quest. Right now, we only know about Total problems. What problems are we talking about?

Total problems.

Yes! In Total problems, we put parts together for a total (gesture)**. What are Total problems?**

When we put parts together for a total.

Does this problem put parts together into a total?

Yes.

What are the parts?

The minutes Eliza spent on her homework on Monday and the minutes Eliza spent on her homework on Friday.

That's right. This problem is about the number of minutes Eliza spent on her homework on Monday. That's one part. This problem also is about the number of minutes Eliza spent on her homework on Friday. That's the other part. Two parts are put together for a total (gesture)**. This is a Total problem.**

So far, we've solved Total problems when the missing information is the total. We've gotten pretty good at doing those Total problems. Today I'll teach you about Total problems that are trickier.

In these Total problems, the story gives you T, or the Total number. The <u>missing</u> number is one of the parts. The question asks us to find one of the parts.

What kind of Total problems will we work today?

(Responds.)

To figure out whether the problem is a Total problem, always ask yourself: Are parts put together into a total (gesture)**? Remember. What's missing might be the total. But what's missing might be one of the parts. Either way, the problem is still a Total problem. It's still about parts being put together into a total.**

Let's read the problem again.

Reread Problem A.

What is this problem about?

(Responds.)

Yes! This problem is about two parts: one part is the number of minutes Eliza spent on her homework on Monday; the other part is the the number of minutes Eliza spent on her homework on Friday. The problem also is about a total. The total is the number of minutes Eliza spent on her homework on Monday and Friday. But the total is not in the question, like we're used to. To figure out if a problem is a Total problem, you can't just look at the question.

Sometimes the story gives you the total in another part of the story, and the question asks you to find one of the parts. This makes it harder to name the problem type. You have to think hard to decide whether a problem is talking about parts being put together for a total.

Soon, we'll learn about other types of problems. Then, we'll have to work even harder to figure out whether the problem is a Total problem or another type of problem. We need to get really good at naming Total problems so when we learn about other problems, we know what we're doing.

Let's read the problem one more time. Listen for the parts and the total, no matter where they are in the story. Think: Are parts put together into a total (gesture)**?**

Reread Problem A.

Yes.

Right. In this problem, there are two parts and a total. This is a little tricky. The first sentence says that Eliza spent 80 minutes doing homework on Monday and Friday. Does this mean that Eliza spent 80 minutes doing homework on Monday?

No.

Does this mean that Eliza spent 80 minutes doing homework on Friday?

No.

That's right. This sentence tells the number of minutes Eliza spent doing homework *altogether*. It's not just talking about the minutes Eliza spent doing homework on Monday. It's not just talking about the minutes Eliza spent doing homework on Friday. It's talking about the minutes Eliza spent doing homework on Monday *and* Friday *together*. It's talking about the total.

This problem is different from the Total problems we've worked before. Those other problems always asked us to find the total. This problem (point) **tells us the total. Today, we have to find one of the parts.**

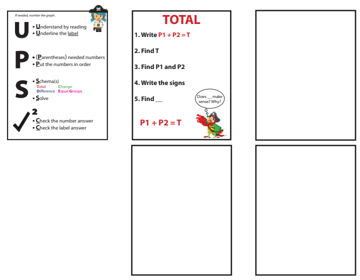
Because this problem is about putting parts together into a total, we know it's a Total problem. What should I put next to the problem?

T.

Right. To remind me it's a Total problem, I write 1-T next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. T stands for Total problem.

Write 1-T.

Display Large Schema Mat - Version 1 with Total poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Remind me, what does the first S stand for?

Schemas.

What are schemas?

Problem types.

Exactly! Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

What's Step 1?

Write P1 + P2 = T.

Good. We write the Total equation: P1 plus P2 is the same as T.

(Writes.)

Step 2: "Find T." In the problems we've worked on before today, the missing information was always the total. This problem is different. The first sentence says, "Eliza spent 80 minutes doing homework on Monday and Friday." This

sentence tells us the total number of minutes Eliza spent doing homework on Monday and Friday. It's not talking about the number minutes Eliza spent doing homework on Monday. It's not talking about the number of minutes Eliza spent doing homework on Friday. It's talking about the number of minutes Eliza spent doing homework on Monday *and* Friday altogether (gesture)**.**

This word "and" (point) **is really important here because it shows that 80 talks about both the minutes Eliza spent doing homework on Monday *and* the minutes Eliza spent doing homework on Friday.**

If Eliza spent 80 minutes doing homework on Monday *and* Friday, the total is 80. This problem tells us the total. It asks us to find one of the parts.

The total, or T, is 80. Check off the 80 in the problem, and write the number 80 in the number sentence underneath T, like this. We check off the 80 so I remember I've already used it.

Check off 80 and write 80 underneath T.

(Writes.)

Step 3 says, "Find P1 and P2." We know the total is 80. Now we have to find the parts. The number of minutes Eliza spent doing homework on Monday is a part. The number of minutes Eliza spent doing homework on Friday is a part. How many minutes did Eliza spend doing homework on Friday?

We don't know.

That's right. We know the total number of minutes Eliza spent doing homework on Monday and Friday, and we know the number of minutes Eliza spent doing homework on Monday. The missing information is how many minutes Eliza spent doing homework on Friday. The missing information is one of the parts. When one of the parts is missing, we mark P2 with blank. We need to find P2. That's what's missing.

Where do I mark the blank?

Under P2.

Good. Write blank under P2 because part 2 is missing.

(Writes.)

In Total problems, when one of the parts is missing, it doesn't matter if we call the missing part P1 or P2. We get the same answer whether we call the missing part P1 or P2. Let's solve this problem with P2 missing.

We still need to fill in part 1. Remember, the missing part is how many minutes Eliza spent doing homework on Monday. We decided to call the minutes spent doing homework on Friday the missing part 2. The number of minutes Eliza spent doing homework on Monday will be part 1. The minutes Eliza spent doing homework on Monday and Friday will be the total (gesture)**.**

How many minutes did Eliza spend doing homework on Monday? What does the graph tell us?

45.

Yes! Part 1 is 45. Check off the 45 in the graph and write the number 45 in the number sentence underneath P1.

Check off 45 and write 45 underneath P1.

(Writes.)

Have we found all the important information we need?

Yes.

Right. We only have one piece of missing information, P2, and it's marked with a blank. We found T and P1 in the story and graph. Now let's go to Step 4. What's Step 4?

Write the signs.

Good. What math signs do we need to complete our number sentence?

+ and =.

Right. We need a plus sign and the same as sign. Let's write them in the number sentence.

(Writes.)

45 stands for part 1. Blank stands for part 2. 80 stands for the total. Does this look like a number sentence we know how to solve?

Yes.

When we have a part that is missing, we can subtract the total minus part 1 to find the missing part 2.

Do you add or subtract?

Subtract.

That's right. All we need to do is subtract 80 minus 45 to find the missing part 2.

(Subtract.)

What's the difference? Use Counting Up if needed.

35.

Great! Our difference is 35.

Whenever we write an answer to a word problem, we need a number and a label. We know that 35 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Minutes.

We underlined minutes, right here (point)**. Minutes is what the problem is about. It tells us about our missing information. We use the word minutes for our label. So, we write minutes after the number 35.**

Write minutes next to 35. Monitor that the student does this as well.

What is our number answer?

35.

Right. And what is our label answer?

Minutes.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Remind me, what does the second S stand for?

Solve.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "How long did Eliza spend doing homework on Friday?" Does it make sense that our answer is 35 minutes?

Yes.

Yes. Our answer is reasonable.

Did we answer the question, "How long did Eliza spend doing homework on Friday?"

Yes.

Exactly! Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the first checkmark stand for?

Check the number answer.

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is minutes.

What word did we underline in our question sentence?

Minutes.

Exactly. We underlined minutes. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Remind me, what does the second checkmark stand for?

Check the label answer.

Yes! Great job solving that Total problem! Let's try another one!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Javier's family built a house with 1,368 square feet of space. His family used 640 square feet for the first floor and the remaining square feet for the second floor. How many square feet did the family use for the second floor?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 640; P2 = __; T = 1,368*
Number Sentence:	*640 + __ = 1,368*
Answer:	*__ = 728 square feet*

Follow the step-by-step dialogue for Problem A.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right! We have a table, but the table already is numbered for us. This means we can follow the steps on our UPS Check^2 poster.

Solution to Problem C:

The table shows the amounts Mrs. Soto paid for different expenses in October. Mrs. Soto spent $625.00 on her car payment and gas. How much did Mrs. Soto spend on gas in October?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 365.00; P2 = __; T = 625.00*
Irrelevant Information:	~~*Rent, Groceries*~~
Number Sentence:	*365.00 + __ = 625.00*
Answer:	*__ = $260.00*

Follow the step-by-step dialogue for Problem A.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

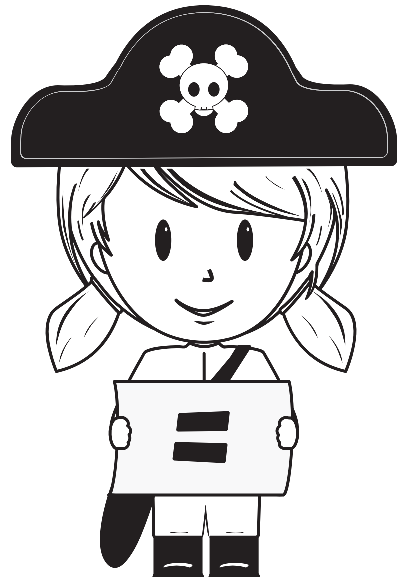
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 6

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total with part missing; five parts
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 6
Buccaneer Problems: Lesson 6
Jolly Roger Review: Lesson 6
Cubes
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Look at A.

Point to A.

This problem says 12 is *the same as* 6 plus blank. Let's read that together.

12 is the same as 6 plus blank.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

To solve this problem with cubes, place 12 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Now, place 6 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 12 cubes on this side of the equal sign (point)**, and 12 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

6.

That's right. You added 6 cubes. So, 12 is *the same as* 6 plus 6. Go ahead and write 6.

(Writes.)

Let's read the number sentence together.

12 is the same as 6 plus 6.

What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as*.

Let's try another one.

Point to B.

This problem says blank plus 3 is *the same as* 9. Let's read that together.

Blank plus 3 is the same as 9.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

To solve this problem with cubes, place 3 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Now, place 9 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 9 cubes on this side of the equal sign (point)**, and 9 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

6.

That's right. You added 6 cubes. So, 6 plus 3 is *the same as* 9. Go ahead and write 6.

(Writes.)

Let's read the number sentence together.

6 plus 3 is the same as 9.

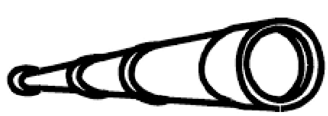
What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as*.

When you see a problem like this (point to B)**, don't worry! All you need to do is make the sides the same!**

Today, we'll work on word problems where we have to make the sides the same, and we'll use our Equation Quest skills!



3: Buccaneer Problems

We've recently started talking about Total problems. What's a Total problem?

When parts are put together into a total.

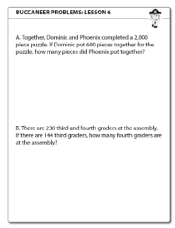
In a Total problem, parts are put together to make a total (gesture)**. Now, sometimes Total problems have two parts and other times Total problems**

have *more* than two parts! And that's okay. It's still a Total problem, and we can still use the Total equation. What's the Total equation?

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total. We have talked about problems where the total is the missing information and problems where the part is the missing information. Let's keep practicing Total problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 6

A. Together, Dominic and Phoenix completed a 2,000 piece puzzle. If Dominic put 600 pieces together for the puzzle, how many pieces did Phoenix put together?

B. There are 230 third and fourth graders at the assembly. If there are 144 third graders, how many fourth graders are at the assembly?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Exactly!

<u>*Solution to Problem A:*</u>

Together, Dominic and Phoenix completed a 2,000 piece puzzle. If Dominic put 600 pieces together for the puzzle, how many pieces did Phoenix put together?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 600; P2 = ___; T = 2,000*
Number Sentence:	*600 + ___ = 2,000*
Answer:	*___ = 1,400 pieces*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Total problem with a missing part.

Yes! Great job solving that Total problem! Let's try another one!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

There are 230 third and fourth graders at the assembly. If there are 144 third graders, how many fourth graders are at the assembly?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 144; P2 = __; T = 230*
Number Sentence:	*144 + __ = 230*
Answer:	*__ = 86 fourth graders*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Total problem with a missing part.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

We don't have a table or a graph, but we have figures with numbers. This

means we will need to refer to the figures as we solve the problem. Let's go ahead and follow the steps on our UPS Check^2 poster.

<u>*Solution to Problem C:*</u>

Maria drew the following figures. What is the perimeter of Figure 4?
Problem Type: *Total, five parts*
Relevant Information: *P1 = 10; P2 = 9; P3 = 9; P4 = 10; P5 = 16; T = __*
Irrelevant Information: ~~*Figure 1, Figure 2, Figure 3*~~
Number Sentence: *10 + 9 + 9 + 10 + 16 = __*
Answer: *__ = 54 mm*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Total problem with five parts.
Review that we find the perimeter by adding together all of the sides of the figure.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

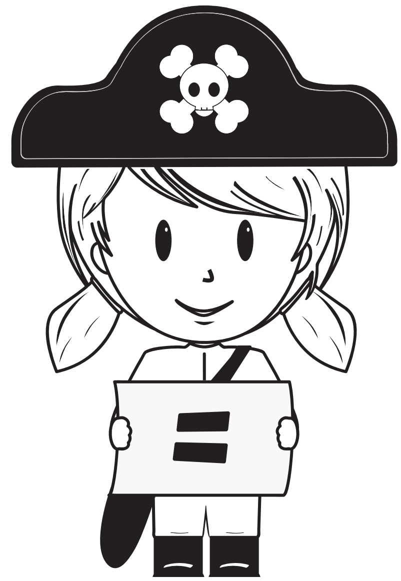
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 7

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total with part missing; three parts
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 7
Buccaneer Problems: Lesson 7
Jolly Roger Review: Lesson 7
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Look at A.

Point to A.

5 plus blank is *the same as* 12. Let's say that together.

5 plus blank is the same as 12.

Every number sentence has two sides. One side is here, on this side of the equal sign (point to 5 + __)**. The other side is there, on that side of the equal sign** (point to 12)**.**

Your job is to make the sides the same. Today, instead of using cubes to make the sides the same, we'll draw pictures. Let's draw to make the sides the same.

To solve this problem with pictures, draw 5 circles on this side (point)**.**

(Draws.)

Now, we draw 12 on this side (point)**. Let's use squares. Draw 12 squares on this side** (point)**.**

(Draws.)

Now, the equal sign acts as a balance. We need to make these sides the same. How many can we draw on this side (point) **to make the sides the same? Let's draw triangles one at a time.**

(Draws.)

So, are the sides the same?

Yes.

You have 12 on this side of the equal sign (point)**, and 12 on that side of the equal sign** (point)**.**

How many triangles did you add to this side (point)**?**

7.

So, 5 plus what is *the same as* 12?

7.

Go ahead and write 7.

(Writes.)

Look at B.

Point to B.

This problem says blank is *the same as* 6 plus 5. Let's read that together.

Blank is the same as 6 plus 5.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

To solve this problem with drawing, draw 6 circles on this side (point)**.**

(Draws.)

Now, we add 5. So, draw 5 squares on this side (point)**.**

Now, the equal sign acts as a balance. We need to make these sides the same. How many can we draw on this side (point) **to make the sides the same? Let's draw circles one at a time.**

(Draws.)

So, are the sides the same?

Yes.

You have 11 on this side of the equal sign (point)**, and 11 on that side of the equal sign** (point)**. So, blank *the same as* what?**

11.

Go ahead and write 11.

(Writes.)

Let's do one more problem.

Point to C.

Blank plus 9 is *the same as* 16. How many circles should you draw in this box (point)**?**

9.

Draw 9 circles.

(Draws.)

Now, how many squares should you draw in that box (point)**?**

16.

Draw 16 squares.

(Draws.)

Now, make the sides the same. Draw triangles in this box (point) **until the sides are balanced.**

(Draws.)

So, blank plus 9 is the same as 16. What is blank? How many triangles did you draw?

7.

Write 7.

(Writes.)

Nice! 7 plus 9 is the same as 16.

Good work! Today, you'll use your Equation Quest skills to balance equations

within word problems.

3: Buccaneer Problems

We've recently started talking about Total problems. What's a Total problem?

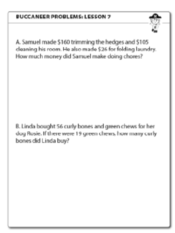
When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. Now, sometimes Total problems have two parts and other times Total problems have *more* than two parts! And that's okay. It's still a Total problem, and we can still use the Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total. We have talked about problems where the total is the missing information and problems where the part is the missing information. Let's keep practicing Total problems!

Point to A.



BUCCANEER PROBLEMS: LESSON 7

A. Samuel made $160 trimming the hedges and $105 cleaning his room. He also made $26 for folding laundry. How much money did Samuel make doing chores?

B. Linda bought 56 curly bones and green chews for her dog Rosie. If there were 19 green chews, how many curly bones did Linda buy?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Exactly!

<u>Solution to Problem A:</u>

Samuel made $160 trimming the hedges and $105 cleaning his room. He also made $26 for folding laundry. How much money did Samuel make doing chores?

Problem Type:	*Total, three parts*
Relevant Information:	*P1 = 160; P2 = 105; P3 = 26; T = __*
Number Sentence:	*160 + 105 + 26 = __*
Answer:	*__ = $291*

Follow steps on the UPS Check² poster.
Follow steps for solving a Total problem with three parts.

Yes! Great job solving that Total problem! Let's try another one!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

Linda bought 56 curly bones and green chews for her dog Rosie. If there were 19 green chews, how many curly bones did Linda buy?

Problem Type:	*Total, two parts*
Relevant Information:	*P1 = 19; P2 = __; T = 56*
Number Sentence:	*19 + __ = 56*
Answer:	*__ = 37 curly bones*

Follow steps on the UPS Check² poster.
Follow steps for solving a Total problem with a missing part.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Visha made a triangular sign with a perimeter of 58 cm. Two sides of the triangle measured 14 cm and 32 cm. What was the length of the third side?

Problem Type:	*Total, three parts*
Relevant Information:	*P1 = 14; P2 = 32; P3 = ___; T = 58*
Number Sentence:	*14 + 32 + ___ = 58*
Answer:	*___ = 12 cm*

Follow steps on the UPS Check² poster.
Follow steps for solving a Total problem with three parts and a missing part.
Review that we find the perimeter by adding together all of the sides of the figure.
Explain that the perimeter is given, which tells us that we are missing one of the parts.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

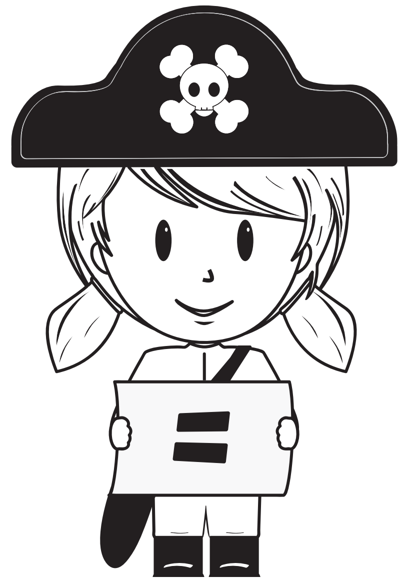
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 8

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 2

Student Materials

Equation Quest: Lesson 8
Buccaneer Problems: Lesson 8
Jolly Roger Review: Lesson 8
Cubes
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Look at A.

Point to A.

10 minus 6 is *the same as* blank.

Up to this point, we've worked on addition number sentences. Today, we'll start to work on subtraction number sentences.

What makes this (point to A) **a subtraction number sentence?**

The minus sign.

That's right. Here is the minus sign (point)**. The minus sign tells us to subtract.**

How would we read this number sentence?

10 minus 6 is the same as blank.

Even though this has a minus sign, we still use the same as when you see the equal sign. Let's read it together.

10 minus 6 is the same as blank.

Great. Now, let's use the cubes to solve a few problems. Let's start with A (point)**. Let's read the problem again. It says 10 minus 6 is *the same as* blank.**

To solve this problem with cubes, we can place 10 cubes (place 10 cubes of one color) **on this side of the equal sign.**

Place 10 cubes.

Now, the minus sign tells us that we need to subtract. How many cubes do we need to subtract?

6.

We need to subtract 6.

Subtract 6 cubes from the 10 cubes.

How many cubes do we have left?

4.

Exactly! We have 4 cubes on this side (point) **of the equal sign. Now, on that side of the equal sign** (point)**, we have a blank.**

So, 4 cubes is *the same as* blank. So, blank is the same as what?

4.

Yes, 10 minus 6 is *the same as* 4.

What does the equal sign mean?

The same as.

That's right. The equal sign means the same as.

Let's try another one.

Point to B.

12 minus blank is *the same as* 8.

To solve this problem with cubes, we can place 12 cubes (place 12 cubes of one color) **on this side of the equal sign.**

Place 12 cubes.

How many cubes do we need to place on this side (point)**?**

8.

Yes! Let's place 8 cubes (place 8 cubes of one color) **on this side of the equal sign.**

Place 8 cubes.

Are the two sides the same?

No.

Exactly! We have 12 cubes on this side of the equal sign (point) **and 8 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 12 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

4.

So, 12 cubes minus blank is *the same as* 8. So, blank is the same as what?

4.

Yes, 12 minus 4 is *the same as* 8.

What does the equal sign mean?

The same as.

That's right. The equal sign means the same as.

Let's try another one.

Point to C.

This problem says 9 is *the same as* 13 minus blank. Let's read that together.

9 is the same as 13 minus blank.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

To solve this problem with cubes, place 9 cubes on this side (point)**.**

(Places cubes.)

Now, on that side (point)**, place 13 cubes.**

(Places cubes.)

Are the two sides the same?

No.

Exactly! We have 9 cubes on this side of the equal sign (point) **and 13 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 13 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

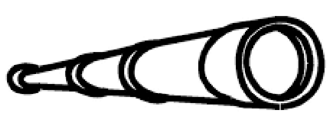
4.

So, 9 is *the same as* 13 minus 4. So, blank is the same as what?

4.

Yes, 9 is *the same as* 13 minus 4.

Good work! Today, you'll use your Equation Quest skills to balance equations within word problems.



3: Buccaneer Problems

Let's review. What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total. *All* Total problems have the same Total equation. What's the Total equation?

P1 + P2 = T.

When we solve word problems, what two things do we need in our answer?

A number and a label.

Very good. You must have a number *and* a label. What is a label?

A word that tells us about our missing information.

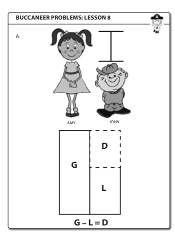
Excellent. A label is a word that tells us about our missing information. Now let's practice solving word problems!

Today, we'll learn a new type of problem. We call these Difference problems.

Difference means the difference between two amounts. In a Difference problem, you <u>compare</u> two amounts. When you compare, you put two amounts side by side to see which amount is greater and which amount is less. You compare two numbers and you find the difference between the amount that's greater and the amount that's less.

Let me show you what I mean.

Point to A.



Look at this picture. This is Amy. Her name is written here (point) **under her picture. And this is John** (point)**. His name is written here under his picture. In this picture, Amy is taller than John. In a Difference problem, our job is to figure out how *much* taller Amy is than John. The difference between Amy and John is this much.**

Point to the difference in the heights.

When we compare Amy and John, this is the <u>difference</u> between their heights. Who is taller?

Amy.

That's right. Amy is taller. Who is shorter?

John.

Right. When we <u>compare</u> how tall they are, Amy is taller. John is shorter.

When you compare two things, like people, or two amounts of something, one amount is greater, and one amount is less. In Difference problems, our job is to figure out how *much* greater/taller or less/smaller one amount is compared to the other amount. Look up here. Let me show you another example.

Point to Difference picture.

This box is the amount that's greater (point and trace around entire "G" box)**. It's like Amy** (write Amy's name in the greater box)**. This box is the amount that's less** (point and trace around the entire "L" box)**. It's like John** (write John's name in the less box)**. This is the difference between Amy and John** (point and trace around the box with the dotted line)**.**

In Difference problems, we compare two amounts to find the difference. One amount is greater. The other amount is less.

To find the difference, we <u>subtract</u>. What signs do we use in subtraction number sentences?

A minus sign and the same as sign.

That's right. To find the difference, we subtract. In our Difference equation, we use a minus sign and the same as sign.

Let's think back to Total problems. In Total problems, we put parts together into a total. What signs do we use in our Total equation, P1 plus P2 is the same as T?

A plus sign and the same as sign.

Right. For our Total equation, we always use a plus sign and the same as sign.

In Difference problems, we compare two amounts to find the difference. In our

Difference equation, we use a minus sign and the same as sign, like this.

Point to the bottom of Difference chart.

The Difference equation is G minus L is the same as D. Let's say that together. The amount that's greater minus the amount that's less is the same as the difference. Here is the minus sign (point), **and here is the same as sign** (point)**.**

Let me show you how the Difference equation is like the picture. G is the amount that's greater or Amy. Let's say Amy is 5 feet tall. I write 5 underneath G and put 5 in the box with G.

Write 5 underneath G and put 5 in the box with G.

L is the amount that's less or John. Let's say John is 3 feet tall. I write 3 underneath L and put 3 in the box with L.

Write 3 underneath L and put 3 in the box with L.

We're finding the difference between Amy and John. That's this much.

Show with your hands the amount between Amy and John.

This is what's missing. So I write a blank underneath D and put a blank in the box with D.

Write a __ underneath D and put a __in the box with D.

Now I put the minus and same as signs into the number sentence. Now I can find blank! When blank is at the end, I solve it. I need to subtract. What's 5 minus 3?

2.

Right. 5 minus 3 is the same as 2. Blank is the same as 2. The difference between Amy and John is 2 feet. Amy is 2 feet taller than John. John is 2 feet shorter than Amy.

2 feet is the difference between Amy and John. In the picture, it's this (trace your finger around the box with D)**. In Difference problems, the story is about one amount being greater or less than another amount. The story is about the**

difference between these amounts.

You earn a treasure coin!

Let's solve another Difference problem!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Exactly!

<u>Solution to Problem B:</u>

Kim scored 7 goals in Friday's soccer game. She scored 5 goals in Saturday's soccer game. How many more goals did she score on Friday?

Problem Type:	*Difference*
Relevant Information:	*G = 7; L = 5; D = __*
Number Sentence:	*7 – 5 = __*
Answer:	*__ = 2 (more) goals*

Follow steps on the UPS Check^2 poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Before today, we had been learning about Total problems. We looked for the

total and the parts anywhere in the story. Always ask yourself, are parts put together into a total (gesture)**? If the answer is yes, it's a Total problem.**

Today we learned about Difference problems. In Difference problems, we look for two things compared in the story. Sometimes the question asks us to find how much greater or how much less. Either way, the problem is asking about the difference.

Let's decide. Is this problem about parts and a total, or is the problem about two amounts being compared?

(Responds.)

Let's read the problem again!

"Kim scored 7 goals in Friday's soccer game. She scored 5 goals in Saturday's soccer game. How many more goals did she score on Friday?"

What is this problem about?

(Responds.)

This problem talks about the number of goals Kim scored: She scored some on Friday, and she scored some on Saturday. The question asks how many more goals she scored on Friday. Is this a Total problem or a Difference problem?

Difference problem.

This problem is a Difference problem because we compare how many goals she scored on Friday to how many goals she scored on Saturday. She scored an amount that's greater on one night (hold one hand face level) **and an amount that's less on the other night** (hold other hand chest level)**. We're looking for the difference** (move hands back and forth)**. We're not finding a total because we're not putting the goals together into a total.**

Difference problems sometimes use words like *more, fewer*, and *less* to tell us about the comparison.

What does *more* mean?

Greater.

That's right. *More* means greater. What does *fewer* mean?

Smaller.

Yes. *Fewer* means smaller. What does *less* mean?

Smaller.

Very good. *Fewer* and *less* actually mean the same thing. Both *fewer* and *less* mean smaller.

The words *more, fewer*, and *less* help us decide the amount that's greater and the amount that's less. These words tell us about the comparison.

Difference problems are not like Total problems because Difference problems have a compare sentence. Look at the problem again.

"Kim scored 7 goals in Friday's soccer game. She scored 5 goals in Saturday's soccer game. How many more goals did she score on Friday?"

What is the compare sentence?

How many more goals did she score on Friday?

The question is our compare sentence because it tells us about the comparison. It asks, "How many more goals did she score on Friday?"

This is the compare sentence because it tells us about the comparison. It is really asking us, "How many more goals did she score on Friday *than* on Saturday?" It helps us decide the amount that's greater and the amount that's less. It helps us decide the numbers that are greater and the numbers that are less.

When the compare sentence asks us to find the difference, we know that the number that's greater and the number that's less are in the problem. The number that's greater will be G. The number that's less will be L.

Whenever I find a compare sentence, I put brackets around the sentence to help me remember it's a compare sentence.

Put brackets around compare sentence.

This compare sentence asks us to find the difference between Friday's goals and Saturday's goals. The problem tells us the amount that's greater and the amount that's less. We have to find the difference.

Display Difference picture.

It's like this (point to the D box). **The goals she scored Friday is the number that's greater or the amount that's greater** (gesture)**. The goals she scored Saturday is the number that's less or the amount that's less** (gesture)**. The story is about one amount being greater or less than another amount. The story is about the difference between these amounts** (gesture)**. It's about the difference between the two numbers. The question asks us to compare these amounts.**

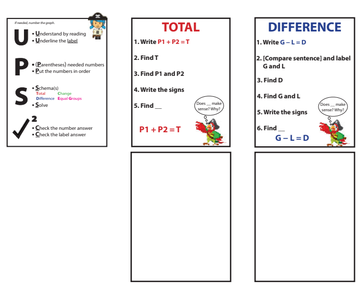
Because this problem is comparing two amounts for a difference, we know it's a Difference problem. What should I put next to the problem?

D.

Right. To remind me it's a Difference problem, I write 1-D next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. D stands for Difference problem.

Write 1-D.

Display Large Schema Mat - Version 2 with Difference poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Difference problem, you're ready to solve it! We decided this is a Difference problem, so we use this Difference poster to solve it. This is the Difference poster (point)**. We'll use it to help organize your work.**

To solve a Difference problem, we have six steps. Step 1. "Write G minus L is the same as D."

In a Difference problem, the story is about one amount being greater or less than another amount. This G stands for the number that's greater. This L stands for the number that's less. We subtract G minus L. G minus L is the same as the difference, D. Once we know the problem is a Difference problem, we write G minus L is the same as D (point)**. This is the Difference equation.**

Write G – L = D.

What does G stand for?

The amount or number that's greater.

What does L stand for?

The amount or number that's less.

What does D stand for?

Difference.

Step 2: "[Compare sentence] and label G and L." We talked about this earlier. What's the compare sentence in this problem?

How many more goals did she score on Friday?

That's right. We put brackets around our compare sentence to help us remember.

Now let's go ahead and label the amount that's greater (G) and the amount that's less (L) in our word problem.

(Writes.)

I write G above Friday, because Friday is talking about the number that's greater. G stands for greater. I write L above Saturday, because Saturday is talking about the number that's less. L stands for less. Remember. <u>Don't write G and L over the numbers</u>, like this (write and then erase)**. Write G and L above the words that represent the greater and less numbers** (demonstrate).

Write G above Friday and L above Saturday.

Over which day did we write G?

Friday.

Over which day did we write L?

Saturday.

Look at Step 3: "Find D."

D is the difference. We have to find out whether the difference is given, or whether you have to find the difference. If the difference were given, it might say "Kim scored 2 more goals on Friday" or "Kim scored 4 fewer goals on Saturday."

In this problem, the difference is not given. The question is asking us how many more, so we have to *find* the difference.

If the difference is not given, then you write a blank under D.

(Writes.)

Step 4: "Find G and L." G stands for the number that's greater. L stands for the number that's less. If the difference, or D, is missing, it's really easy to find G and L.

Remember, this problem is talking about goals. We underlined the word "goals" to help us remember to use numbers that talk about goals. What

numbers in this problem talk about goals?

7 and 5.

That's right. 7 talks about the goals on Friday. 5 talks about the goals on Saturday. Both of these numbers talk about goals. They are both important numbers.

Good. And how many goals did Kim score on Friday?

7.

Excellent. 7 is the number that's greater. That's why we wrote G above Friday. Friday is G because Kim scored more goals on Friday. Check off 7 in the story and write 7 under G.

Check off 7 in the story and write 7 under G.

Over which day did we write L?

Over Saturday.

Good. And how many goals did Kim score on Saturday?

5.

Yes. On Saturday, Kim scored fewer goals. 5 is the number that's less. That's why we wrote L above Saturday. Saturday is L because Kim scored fewer goals on Saturday. I check off 5 in the story and write 5 under L.

Check off 5 in the story and write 5 under L. Monitor that the student does this as well.

Now we have G, L, and D filled in the Difference equation. Look at Step 5.

Step 5: "Write the signs." For Difference problems, what math signs do we need to complete our number sentence?

Minus and the same as signs.

Right. We still need our minus sign and same as sign. I write these in the number sentence like this.

Write the minus sign and same as sign.

7 stands for the number that's greater, or G. 5 stands for the number that's less, or L. Blank stands for the difference, or D. Does this look (point) **like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

7 minus 5 is the same as blank.

Step 6: "Find blank!" You know how to do this!

Do you add or subtract?

Subtract.

That's right. You can just subtract 7 minus 5 to find the difference.

(Subtracts.)

Blank is the same as 2.

In word problems, our answer must have a number and a label. We know the number answer is 2. Now we have to figure out what the label for 2 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Goals.

Right! The question is asking about goals, so that's the best label. We write goals for the label! Goals is the word that tells us about our missing information.

Write "goals" next to 2.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. The problem says, "Kim scored 7 goals in Friday's soccer game. She scored 5 goals in Saturday's soccer game. How many more goals did she score on Friday?" Does 2 goals make sense?

Yes.

The Difference story is about one amount being greater or less than another amount. The story is about the difference between these amounts. The answer, 2 goals, makes sense. It's the difference between Friday's and Saturday's goals. Let me show you why. Let's look at our Difference picture with G, L, and D.

Display Difference picture.

Friday's goals is the number that's greater, so that's like this box.

Write 7 in the box.

Saturday's goals is the number that's less, so that's like this box.

Write 5 in the box.

The difference between Friday and Saturday is the difference, so that's like this box.

Write 2 in the box.

Is our answer reasonable?

Yes.

Right. 2 makes sense. Did we answer the question, "How many more goals did she score on Friday?"

Yes. She scored 2 more goals.

Exactly! Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is goals.

What word did we underline in our question sentence?

Goals.

Exactly. We underlined goals. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Difference problem! Let's try another one!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

What should we do?

Number it.

You are right! This is a picture graph. We call a picture graph a pictograph. Say

that with me.

Pictograph.

Great job! Let's number the pictograph. Do you see any special directions or a key below the pictograph?

(Responds.)

Nice! The key says that each flower equals ten flowers, so let's count by tens when we number the graph.

(Numbers graph using the directions from the key to count by tens.)

<u>Solution to Problem C:</u>

> *Mitchell picked flowers from a field. The pictograph shows how many of each type of flower he picked. How many more roses than daisies did Mitchell pick?*
> *Problem Type:* *Difference*
> *Relevant Information:* *G = 60; L = 40; D = __*
> *Irrelevant Information:* ~~*50 tulips*~~
> *Number Sentence:* *60 – 40 = __*
> *Answer:* *__ = 20 (more) roses*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Before today, we have been learning about Total problems. We looked for the total and the parts anywhere in the story. Always ask yourself, are parts put together into a total? If the answer is yes, it's a Total problem.

Today we learned about Difference problems. In Difference problems, we look for two things compared in the story. Sometimes the question asks us to find how much greater or how much less. Either way, the problem is asking about the difference.

Let's decide. Is this problem about parts and a total, or is the problem about two amounts being compared (gesture)**?**

(Responds.)

Let's read the problem again!

"Mitchell picked flowers from a field. The pictograph shows how many of each type of flower he picked. How many more roses than daisies did Mitchell pick?"

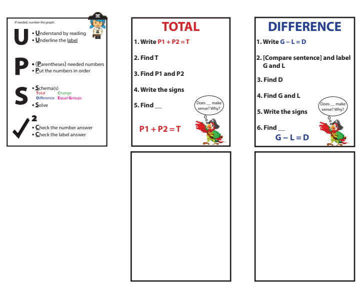
This problem talks about the number of flowers Mitchell picked: He picked some roses, and he picked some daisies. The question asks how many more roses than daisies Mitchell picked. Is this a Total problem or a Difference problem?

Difference problem.

Right. To remind me it's a Difference problem, I write 1-D next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. D stands for Difference problem.

Write 1-D.

Display Large Schema Mat - Version 2 with Difference poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Difference problem, you're ready to solve it! We decided this is a Difference problem, so we use this Difference poster to solve it. This is the Difference poster (point)**. We'll use it to help organize your work.**

To solve a Difference problem, we have six steps. Step 1. "Write G minus L is the same as D."

In a Difference problem, the story is about one amount being greater or less than another amount. This G stands for the number that's greater. This L stands for the number that's less. We subtract G minus L. G minus L is the same as the difference, D. Once we know the problem is a Difference problem, we write G minus L is the same as D (point)**. This is the Difference equation.**

Write G – L = D.

What does G stand for?

The amount or number that's greater.

What does L stand for?

The amount or number that's less.

What does D stand for?

Difference.

Step 2: "[Compare sentence] and label G and L."

Difference problems are not like Total problems because Difference problems have a compare sentence. Difference problems sometimes use words like *more, fewer*, and *less* to tell us about the comparison.

What does *more* mean?

Greater.

That's right. *More* means greater. What does *fewer* mean?

Smaller.

Yes. *Fewer* means smaller. What does *less* mean?

Smaller.

Very good. *Fewer* and *less* actually mean the same thing. Both *fewer* and *less* mean smaller.

The words *more, fewer*, and *less* tell us about the comparison and help us decide the amount that's greater and the amount that's less.

Look at the problem again. It says, "Mitchell picked flowers from a field. The pictograph shows how many of each type of flower he picked. How many more roses than daisies did Mitchell pick?"

What is the compare sentence?

How many more roses than daisies did Mitchell pick?

The question is our compare sentence. It asks, "How many more roses than daisies did Mitchell pick?"

This is the compare sentence because it tells us about the comparison. It helps us decide the amount that's greater and the amount that's less. It helps us decide the numbers that are greater and the numbers that are less.

Whenever I find a compare sentence, I put brackets around the sentence to help me remember it's a compare sentence.

Put brackets around compare sentence.

Now let's go ahead and label the amount that's greater (G) and the amount that's less (L) in our word problem.

What's the amount that's greater?

Roses.

And what's the amount that's less?

Daisies.

Great! Go ahead and write G above roses and L above daisies. Remember to write the G and L above the *words* and not the numbers.

(Writes.)

Write G above roses and L above daisies.

Look at Step 3: "Find D."

D is the difference. We have to find out whether the difference is given, or whether you have to find the difference. Is the difference given?

No.

You're right. The question is asking us to *find* the difference.

If the difference is not given, then you write a blank under D.

(Writes.)

Step 4: "Find G and L." G stands for the number that's greater. L stands for the number that's less. If the difference, or D, is missing, it's really easy to find G and L.

Remember, this problem is talking about roses and daisies. What numbers in this problem talk about roses and daisies?

60 and 40.

That's right. 60 talks about the roses Mitchell picked. 40 talks about the daisies Mitchell picked. Both of these numbers talk about flowers. They are both important numbers.

How many roses did Mitchell pick?

60.

Excellent. 60 is the number that's greater. That's why we wrote G above roses.

Roses are G because Mitchell picked more roses than daisies. Check off 60 in the story and write 60 under G.

Check off 60 in the story and write 60 under G.

Over which flower did we write L?

Over daisies.

Good. And how many daisies did Mitchell pick?

40.

Yes. Mitchell picked 40 daisies. 40 is the number that's less. That's why we wrote L above daisies. Daisies is L because Mitchell picked fewer daisies than roses. I check off 40 in the story and write 40 under L.

Check off 40 in the story and write 40 under L. Monitor that the student does this as well.

Now we have G, L, and D filled in the Difference equation. Look at Step 5.

Step 5: "Write the signs." For Difference problems, what math signs do we need to complete our number sentence?

Minus and the same as signs.

Right. We still need our minus sign and our same as sign. I write these in the number sentence like this.

Write the minus sign and same as sign.

60 stands for the number that's greater, or G. 40 stands for the number that's less, or L. Blank stands for the difference, or D. Does this look (point) **like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

60 minus 40 is the same as blank.

Step 6: "Find blank!" You know how to do this!

Do you add or subtract?

Subtract.

That's right. You can just subtract 60 minus 40 to find the difference.

(Subtracts.)

Blank is the same as 20.

In word problems, our answer must have a number and a label. We know the number answer is 20. Now we have to figure out what the label for 20 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Roses.

Right! The question is asking about roses, so that's the best label. We write roses for the label! Roses is the word that tells us about our missing information.

Write "roses" next to 20.

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our difference reasonable?

Yes! 20 roses makes sense.

Nice! We know our difference makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is roses.

What word did we underline in our question sentence?

Roses.

Exactly. We underlined roses. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Difference problem!

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.
For the top part of this lesson, the student will bracket the compare sentence and label

the G and L.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

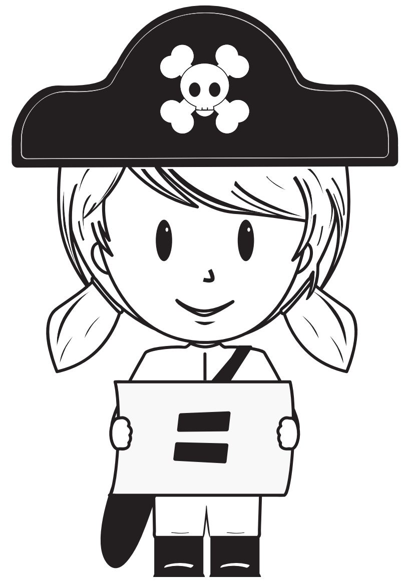
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 9

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Difference; Compare sentences
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 2

Student Materials

Equation Quest: Lesson 9
Buccaneer Problems: Lesson 9
Jolly Roger Review: Lesson 9
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Look at A.

Point to A.

Yesterday, we started talking about subtraction number sentences. Today, we will continue our work with subtraction number sentences.

What makes this (point to A) **a subtraction number sentence?**

The minus sign.

That's right. Here is the minus sign (point)**. The minus sign tells us to subtract.**

Even though this has a minus sign, we still use the same as when you see the equal sign. Let's read it together.

10 minus blank is the same as 6.

Great. Today, let's solve a few problems by drawing. Let's start with A (point)**. Let's read the problem again. It says 10 minus blank is *the same as* 6.**

To solve this problem by drawing, let's draw 10 circles (draw 10 circles) **on this side of the equal sign** (point)**.**

Draw 10 circles.

What do we need to draw on that side of the equal sign (point)**?**

(Responds.)

Exactly! We need to draw 6. Let's draw 6 squares (draw 6 squares) **on that side of the equal sign.**

Draw 6 squares.

Now, the minus sign tells us that we need to subtract. Let's cross out circles from this side (point) **until we have the same number of shapes on each side.**

(Crosses out circles.)

Assist student in crossing out 4 circles from the left side of the same as sign.

Are the sides the same?

Yes.

Exactly! We have the same number of circles on this side (point) **as we do squares on that side** (point)**.**

How many circles did you cross out?

4.

Exactly! So, 10 cubes minus blank is *the same as* 6. Blank is the same as what?

4.

Yes, 10 minus 4 is *the same as* 6.

What does the equal sign mean?

The same as.

That's right. The equal sign means the same as.

Let's try another one.

Point to B.

Let's read the problem. 15 minus blank is *the same as* 8.

How do we solve this problem by drawing?

(Responds.)

To solve this problem by drawing, let's draw 15 circles (draw 15 circles) **on this side of the equal sign** (point)**.**

Draw 15 circles.

What do we need to draw on that side of the equal sign (point)**?**

(Responds.)

Exactly! We need to draw 8. Let's draw 8 squares (draw 8 squares) **on that side of the equal sign** (point)**.**

Draw 8 squares.

Now, the minus sign tells us that we need to subtract. Let's cross out circles from this side (point) **until we have the same number of shapes on each side.**

(Crosses out circles.)

Assist student in crossing out 7 circles from the left side of the same as sign.

Are the sides the same?

Yes.

Exactiy! We have the same number of circles on this side (point) **as we do squares on that side** (point)**.**

How many circles did you cross out?

7.

Exactly! So, 15 cubes minus blank is *the same as* 8. Blank is the same as what?

7.

Yes, 15 minus 7 is *the same as* 8.

What does the equal sign mean?

The same as.

That's right. The equal sign means the same as.

Let's try one more.

Point to C.

This problem says blank is *the same as* 14 minus 9. Let's read that together.

Blank is the same as 14 minus 9.

This problem looks a little different, but we can solve it. All we need to do is make the sides the same.

How do we solve this problem by drawing?

(Responds.)

We don't need to draw any shapes on this side (point) **of the equal sign because we have a blank. Let's look at that side** (point) **of the equal sign. How many shapes should we draw?**

(Responds.)

Right! Let's draw 14 circles (draw 14 circles) **on that side of the equal sign** (point)**.**

Draw 14 circles.

Now, the minus sign tells us that we need to subtract. Let's cross out circles from that side (point)**.**

How many circles do we need to cross out?

9.

Exactly! The problem says 14 minus 9, so let's cross out 9 circles.

(Crosses out circles.)

Assist student in crossing out 9 circles from the right side of the same as sign.

How many circles do we have left?

5.

So, 5 is *the same as* 14 minus 9. So, blank is the same as what?

5.

Yes, 5 is *the same as* 14 minus 9.

Good work! Today, you'll use your Equation Quest skills to balance equations within word problems.

3: Buccaneer Problems

Let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Let’s review. What’s the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Now say the Difference equation again.

G – L = D.

When we solve word problems, what two things do we need in our answer?

A number and a label.

Very good. You must have a number *and* a label. What is a label?

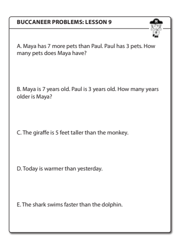
A word that tells us about our missing information.

Excellent. A label is a word that tells us about our missing information. Now let’s practice solving word problems!

So far, we’ve talked about how Difference problems show a comparison to tell us the amount that is greater and the amount that is less.

Difference problems sometimes use words to tells us about the comparison. These words are *more*, *fewer*, or *less*. Sometimes these words are not *more*, *fewer*, or *less*. Let me show you what I mean.

Point to A.


BUCCANEER PROBLEMS: LESSON 9

A. Maya has 7 more pets than Paul. Paul has 3 pets. How many pets does Maya have?

B. Maya is 7 years old. Paul is 3 years old. How many years older is Maya?

C. The giraffe is 5 feet taller than the monkey.

D. Today is warmer than yesterday.

E. The shark swims faster than the dolphin.

Look at this problem. "Maya has 7 more pets than Paul. Paul has 3 pets. How many pets does Maya have?"

Point to B.

Now look at this problem. "**Maya is 7 years old. Paul is 3 years old. How many years older is Maya?"**

What's the same about these problems?

They are both about Maya and Paul.

Right. Both problems are about Maya and Paul. And the numbers in both problems are the same. But these problems are not the same in an important way. Let me show you. This problem (point) **says, "Maya has 7 more pets than Paul." Sometimes, the word *more* tells us about a comparison. Do you see the word *more* in this other problem** (point)?

No.

That's right. This problem (point) **does not have the word *more*. But it's still telling us about a comparison. The question asks, how many years older is Maya** (emphasize "er")**? Let's talk about the word *older*** (emphasize "er")**. The "er" in *older* is like saying more. *Older* is the same as saying "more old." How many more years old is Maya than Paul? *Older*** (emphasize "er") **tells us about a comparison. Words that end in "er," like *older*, are sometimes words that tell us about a comparison. Think about the word tall. How can you make tall show a comparison?**

Change tall to taller.

Yes. We make tall show a comparison by changing tall to taller. Taller is like saying what?

More tall than.

We can say Mary is taller than Harry. That's like saying Mary is *more* tall than Harry. How can we make thick show a comparison?

Change thick to thicker.

Yes. We make thick show a comparison by changing thick to thicker. Thicker is like saying what?

More thick than.

We can say ice cream is thicker than water. That's like saying ice cream is *more* thick that water.

Thicker is like saying what?

More thick than.

Look at this sentence.

Point to C.

"The giraffe is 5 feet taller than the monkey."

Do you see a word that tells us about a comparison?

Yes. Taller.

Good. Let's say the sentence in a different way. Let's use the word *more*.

The giraffe is 5 feet more tall than the monkey.

This is the compare sentence because the sentence shows a comparison. Whenever you see a compare sentence, draw brackets around the sentence, like this.

Draw bracket at beginning and end of sentence.
[The giraffe is 5 feet taller than the monkey.]

In this compare sentence, we're going to label the amount that's greater and the amount that's less. If the giraffe is taller, is the giraffe greater or less than the monkey?

Greater.

The giraffe is greater. So, write G above giraffe. G stands for greater.

(Writes.)

If the giraffe is the amount that's taller or greater, then the monkey is the amount that's less. Write L above monkey. L stands for less.

(Writes.)

Excellent work marking that compare sentence.

Point to D.

"Today is warmer than yesterday."

Do you see a word that tells us about a comparison?

Yes. Warmer.

Tell me another way to say that sentence.

Today is more warm than yesterday.

This is the compare sentence because the sentence shows a comparison. Whenever you see a compare sentence, draw brackets around the sentence.

(Draws brackets.)

In this compare sentence, we're going to label the amount that's greater and the amount that's less. If today is warmer than yesterday, then which day has the temperature that's greater?

Today.

Today has the temperature that's greater. So, write G above today. G stands for greater.

(Writes.)

If today has the temperature that's greater, then yesterday has the temperature that's less. Write L above yesterday. L stands for less.

(Writes.)

Great job! Let's try one more. Look at this sentence.

Point to E.

"The shark swims faster than the dolphin."

Do you see a word that tells us about a comparison?

Faster.

How can you say this sentence in a different way? Remember to use the word *more*.

The shark swims more fast than the dolphin.

Excellent! What do you do to the compare sentence?

Draw brackets.

Go ahead and draw brackets around the compare sentence.

(Draws.)

If the shark swims faster, does the shark have the amount that's greater or the amount that's less?

The amount that's greater.

The shark swims faster, so the shark is the amount that's greater. So, write G above shark. G stands for greater.

(Writes.)

If the shark is the amount that's greater, then what is the amount that's less?

Dolphin.

Write L above dolphin. L stands for less.

(Writes.)

Now, you should look for a compare sentence. Remember, words that tell us about a comparison are words like *more* or *less*. Words that tell us about a comparison also are words that end in "er" that mean more than or less than. Words like *thicker, faster, smaller* (emphasize "er") **are all words that tell us about a comparison.**

You earn a treasure coin!

Point to F.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We have a shaded model. Let's go ahead and count the number of shaded regions for Armando and Hannah.

(Numbers shaded model.)

<u>Solution to Problem F:</u>

Armando and Hannah read the same book. The shaded part of the model represents the number of chapters each student read. How many fewer chapters did Armando read than Hannah?

Problem Type:	*Difference*
Relevant Information:	*G = 16; L = 13; D = __*
Number Sentence:	*16 – 13 = __*
Answer:	*__ = 3 (fewer) chapters*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Difference problem.
Review compare sentence and G and L with student.

Point to G.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

We don't see a table or a graph, but we see a picture. The picture already is numbered. This means we may need to use these numbers to solve our problem. Let's go ahead and follow our UPS Check^2 steps.

Solution to Problem G:

Latoya has the two fish shown below in a fish tank. What is the difference in inches between the lengths of these two fish?

Problem Type:	*Difference*
Relevant Information:	*G = 54.1; L = 23.9; D = __*
Number Sentence:	*54.1 – 23.9 = __*
Answer:	*__ = 30.2 inches*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Difference problem.
Review that the question is asking us to find the difference, which is a clue that the problem is a Difference problem.

Explain that we are comparing the difference between two amounts: the length of the larger fish and the length of the smaller fish.
Bracket the question sentence and label G on the larger fish and L on the smaller fish.
Remind student to line up the place values when subtracting decimals.

Great job solving that Difference problem!

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

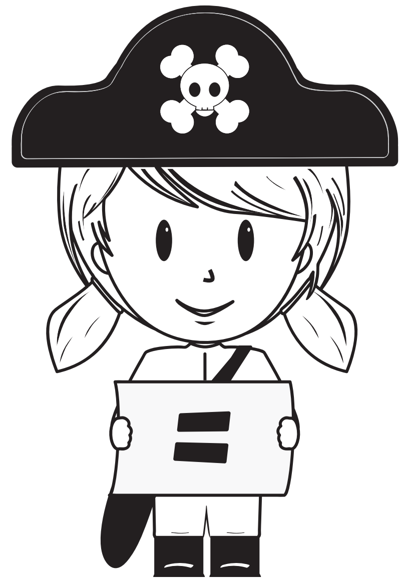
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 10

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total and Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 2

Student Materials

Equation Quest: Lesson 10
Buccaneer Problems: Lesson 10
Jolly Roger Review: Lesson 10
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today, we are going to do something a little different. Instead of solving for blank, we are going to look at equations that already have been solved.

We will write *correct* if the equal sign is used correctly and the number sentence is true. We will write *incorrect* if the equal sign is used incorrectly and the number sentence is false.

Point to A.

This number sentence says, 9 plus 5 is *the same as* (point to =) **4. Let's use this balance** (point) **to see if what's on the left side of the equal sign is the same as what's on the right side of the equal sign.**

Let's look at the left side of the equal sign. What does it say?

9 plus 5.

Good! What is 9 plus 5? If you don't know the answer off the top of your head, you can use Counting Up.

14.

Exactly! 9 plus 5 is the same as 14. Now let's look at the right side of the equal sign. What does it say?

4.

Is the number on the left side of the equal sign the same as the number on the right side of the equal sign?

No.

Right! 14 is not the same as 4. So, is the equation correct or incorrect?

Incorrect.

Great! Go ahead and write incorrect in the blank.

(Writes.)

Point to B-D.

Now it's your turn. We'll work each problem one at a time and decide if the equation is correct or incorrect.

Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

And what do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Now say the Difference equation again.

G – L = D.

When we solve word problems, what two things do we need in our answer?

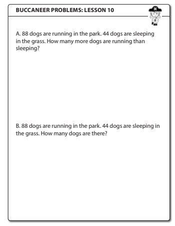
A number and a label.

Very good. You must have a number *and* a label. What is a label?

A word that tells us about our missing information.

Excellent. A label is a word that tells us about our missing information. Now let's practice solving word problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 10

A. 88 dogs are running in the park. 44 dogs are sleeping in the grass. How many more dogs are running than sleeping?

B. 88 dogs are running in the park. 44 dogs are sleeping in the grass. How many dogs are there?

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem A*</u>:

88 dogs are running in the park. 44 dogs are sleeping in the grass. How many more dogs are running than sleeping?
Problem Type: *Difference*
Relevant Info: *G = 88; L = 44; D = __*
Number Sentence: *88 – 44 = __*
Answer: *__ = 44 (more) dogs*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. If you think it's a Total problem, ask: Are parts put together for a total (gesture)**?**

We've also learned about Difference problems. If you think it's a Difference problem, ask: Are two amounts compared for a difference (gesture)**? Difference problems compare two amounts for a difference. When we compare two amounts, you find the amount that's greater and the amount that's less.**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference?

Great job! Let's decide. Is this problem about parts put together into a total, or is it about two amounts compared for a difference (gesture)**? Let's read the problem together.**

"88 dogs are running in the park. 44 dogs are sleeping in the grass. How many more dogs are running than sleeping?"

What type of problem is this?

Difference.

How do you know it's a Difference problem?

(Student.)

That's right. What amounts are we comparing?

Running dogs and sleeping dogs.

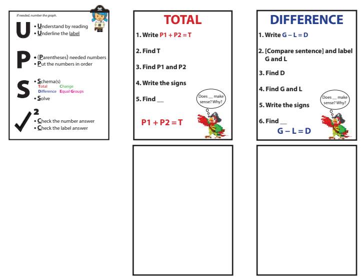
That's right. The story is about two amounts being compared: running dogs and sleeping dogs. The story is about the difference between these amounts (gesture)**.**

To remind me it's a Difference problem, I write 1-D next to the problem. 1 stands for the first step of solving. Remember, the problems we are working on now only have one step. Later, we will work problems with two steps. D stands for Difference problem.

(Writes.)

Write 1-D.

Display Large Schema Mat - Version 2 with Difference poster.



To figure out if this is a Difference problem, it's helpful to look for a compare sentence. A compare sentence sometimes has words that tell us about a comparison. These words can be words like *more, fewer,* or *less.* These words also can be "er" words like *taller, faster,* or *shorter.* Do you see a compare sentence in this problem?

Yes.

What's the compare sentence?

How many more dogs are running than sleeping?

That's right. There is a compare sentence. It says, "How many more dogs are running than sleeping?" The question is asking us to compare the running dogs to the sleeping dogs. I put brackets around the compare sentence to help me remember this is where it is.

(Writes.)

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Difference problem, you're ready to solve it! We decided this is a Difference problem, so we use this Difference poster to solve it. This is the Difference poster (point)**. We'll use it to help organize your work.**

To solve a Difference problem, we have six steps. Step 1: "Write G minus L is the same as D."

In a Difference problem, the story is about one amount being greater or less than another amount. This G stands for the number that's greater. This L stands for the number that's less. We subtract G minus L. G minus L is the same as the difference, D. Once we know the problem is a Difference problem, we write G minus L is the same as D (point)**. This is the Difference equation.**

Write G – L = D.

What does G stand for?

The amount or number that's greater.

What does L stand for?

The amount or number that's less.

What does D stand for?

Difference.

Step 2: "[Compare sentence] and label G and L."

Difference problems are not like Total problems because Difference problems have a compare sentence.

What did we say our compare sentence was?

How many more dogs are running than sleeping?

You're right. This is the compare sentence because it tells us about a comparison. It helps us decide the amount that's greater and the amount that's less. It helps us decide the numbers that are greater and the numbers that are less.

Whenever I find a compare sentence, I put brackets around the sentence to help me remember it's a compare sentence.

Put brackets around compare sentence again.

Now let's go ahead and label the amount that's greater (G) and the amount that's less (L) in our word problem.

What's the amount that's greater?

Dogs that are running.

And what's the amount that's less?

Dogs that are sleeping.

Great! Go ahead and write G above running and L above sleeping. Remember to write the G and L above the *words* and not the numbers.

(Writes.)

Write G above running and L above sleeping.

Look at Step 3: "Find D."

D is the difference. We have to find out whether the difference is given, or whether you have to find the difference. Do we know the difference or are we looking for the difference?

We are looking for the difference.

You're right. We have to *find* the difference.

If the difference is not given, then you write a blank under D.

(Writes.)

Step 4: "Find G and L." G stands for the number that's greater. L stands for the number that's less. If the difference, or D, is missing, it's really easy to find G and L.

Remember, this problem is talking about running dogs and sleeping dogs. What numbers in this problem talk about running dogs and sleeping dogs?

88 and 44.

That's right. 88 talks about the dogs that were running in the park. 44 talks about the dogs that were sleeping in the grass. Both of these numbers talk about dogs. They are both important numbers.

How many dogs were running in the park?

88.

Excellent. 88 is the number that's greater. That's why we wrote G above running. Running dogs are G because there were more running dogs than sleeping dogs. Check off 88 in the story and write 88 under G.

Check off 88 in the story and write 88 under G.

Over which dogs did we write L?

Over sleeping dogs.

Good. And how many dogs were sleeping in the park?

44.

Yes. 44 dogs were sleeping in the park. 44 is the number that's less. That's why we wrote L above sleeping. Sleeping dogs are L because there were fewer dogs sleeping in the park than running in the grass. I check off 44 in the story and write 44 under L.

Check off 44 in the story and write 44 under L. Monitor that the student does this as well.

Now we have G, L, and D filled in the Difference equation. Look at Step 5.

Step 5: "Write the signs." For Difference problems, what math signs do we need to complete our number sentence?

Minus and the same as signs.

Right. We still need our minus sign and our same as sign. I write these in the number sentence like this.

Write the minus sign and the same as sign.

88 stands for the number that's greater, or G. 44 stands for the number that's less, or L. Blank stands for the difference, or D. Does this look (point) **like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

88 minus 44 is the same as blank.

Step 6: "Find blank!" You know how to do this!

Do you add or subtract?

Subtract.

That's right. You can just subtract 88 minus 44 to find the difference.

(Subtracts.)

Blank is the same as 44.

In word problems, our answer must have a number and a label. We know the number answer is 44. Now we have to figure out what the label for 44 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Dogs.

Right! The question is asking about dogs, so that's the best label. We write dogs for the label! Dogs is the word that tells us about our missing information.

Write "dogs" next to 44.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our difference reasonable?

Yes!

Nice! We checked our difference and we know it makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is dogs.

What word did we underline in our question sentence?

Dogs.

Exactly. We underlined dogs. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Nice job working that Difference problem! Let's try another one.

Point to B.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

88 dogs are running in the park. 44 dogs are sleeping in the grass. How many dogs are there?

Problem Type:	*Total, two parts*
Relevant Info:	*P1 = 88; P2 = 44; T = __*
Number Sentence:	*88 + 44 = __*
Answer:	*__ = 132 dogs*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

Look back at Problem A. Now look at Problem B. How are these problems the same? How are they different?

They are the same because they are both about 88 dogs running and 44 dogs sleeping. They are different because the questions are not the same.

Good. The questions are different. The question in Problem B says, "How many dogs are there?"

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**?**

If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference?

Problem A compared the dogs. We knew that from the question: "How many

more dogs are running than sleeping?"

In Problem B, the question says, "How many dogs are there?" Does this question ask us to compare the dogs?

No.

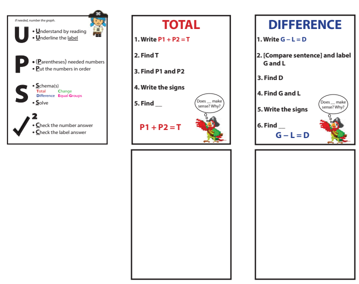
In Problem B, the question doesn't ask us to compare the dogs. Does it ask us to put them together into a total?

Yes.

Good, the question says, "How many dogs are there?" This means the sleeping and running dogs are put together into a total. The parts are the running dogs and the sleeping dogs. It's a Total problem.

Write 1-T.

Display Large Schema Mat - Version 2 with Total poster.



(Writes.)

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Now that we have identified the schema, we can move to the second S.

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Total problem, you're ready to solve it! We decided this is a Total problem, so we use

this Total poster to solve it. This is the Total poster (point)**. We'll use it to help organize your work.**

To solve a Total problem, we have five steps. Step 1: "Write P1 plus P2 is the same as T."

Once we know the problem is a Total problem, we write P1 plus P2 is the same as T (point)**. This is the Total equation.**

Write P1 + P2 = T.

Step 2: "Find T."

We have to find out whether the total is given, or whether you have to find the total. Do we know the total?

No.

You're right. The question is asking us about the total number of dogs that are running and sleeping.

If the total is not given, then you write a blank under T.

(Writes.)

Step 3: "Find P1 and P2." What's P1?

The dogs that are running in the park.

That's right. And how many dogs are running in the park?

88.

Excellent. 88 is P1. Check off 88 in the story and write 88 under P1.

Check off 88 in the story and write 88 under P1.

What's P2?

The dogs that are sleeping in the grass.

That's right. And how many dogs are sleeping in the grass?

44.

Excellent. 44 is P2. Check off 44 in the story and write 44 under P2.

Check off 44 in the story and write 44 under P2.

Now we have P1, P2, and T filled in the Total equation. Look at Step 4.

Step 4: "Write the signs." For Total problems, what math signs do we need to complete our number sentence?

Plus and the same as signs.

Right. We still need our plus sign and our same as sign. I write these in the number sentence like this.

Write the plus sign and the same as sign.

Does this look (point) **like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

88 plus 44 is the same as blank.

Step 5: "Find blank!" You know how to do this!

Do you add or subtract?

Add.

That's right. You can just add 88 plus 44 to find the total.

(Adds.)

Blank is the same as 132.

In word problems, our answer must have a number and a label. We know

the number answer is 132. Now we have to figure out what the label for 132 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Dogs.

Right! The question is asking about dogs, so that's the best label. We write dogs for the label! Dogs is the word that tells us about our missing information.

Write "dogs" next to 132.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our sum reasonable?

Yes!

Nice! We checked our sum and we know it makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is dogs.

What word did we underline in our question sentence?

Dogs.

Exactly. We underlined dogs. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this Total problem! Let's try one more word problem.

Point to C.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

Yes.

You're right. There's a table, but it's already numbered for us. Let's move on to our UPS Check^2 steps.

<u>Solution to Problem C:</u>

The table shows the amounts Billy and Sally paid for electricity each month for the last five months. Based on the table, how much less did Billy pay for electricity in May than Sally?

Problem Type:	*Difference*
Relevant Info:	*G = 138.50; L = 87.00; D = __*
Irrelevant Info:	~~*January, February, March, April*~~
Number Sentence:	*138.50 – 87.00 = __*
Answer:	*__ = $51.50*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Difference problem.
Review the compare sentence and G and L with student.
Remind student to line up the place values when subtracting decimals.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

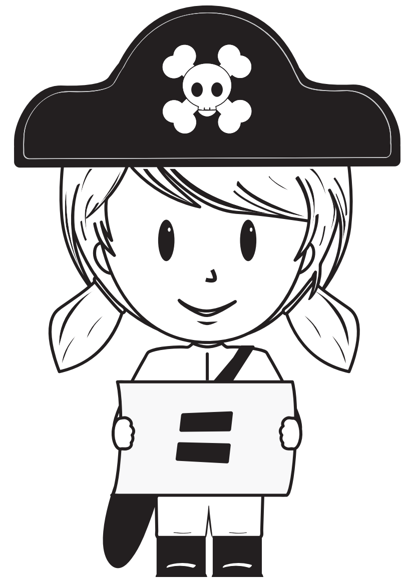
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 11

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Total and Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 11
Buccaneer Problems: Lesson 11
Jolly Roger Review: Lesson 11
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Like yesterday, we will determine if the equal sign is used correctly for each of the equations below.

Point to A.

This number sentence says, 11 minus 5 is *the same as* (point to =) **16. Let's use this balance** (point) **to see if what's on the left side of the equal sign is the same as what's on the right side of the equal sign.**

Let's look at the left side of the equal sign. What does it say?

11 minus 5.

Good! What is 11 minus 5? If you don't know the answer off the top of your head, you can use Counting Up.

6.

Exactly! 11 minus 5 is the same as 6. Now let's look at the right side of the equal sign. What does it say?

16.

Is the number on the left side of the equal sign the same as the number on the right side of the equal sign?

No.

Right! 6 is not the same as 16. So, is the equation correct or incorrect?

Incorrect.

Great! Go ahead and write incorrect in the blank.

(Writes.)

Point to B-D.

Now it's your turn. We'll work each problem one at a time and decide if the

equation is correct or incorrect.

Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

And what do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

So far, we have learned about Total problems and Difference problems. Today we are going to talk about problems that are Total *and* Difference problems. Before we get started, let's review.

Let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

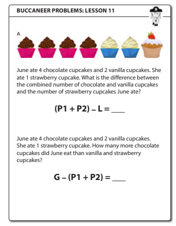
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.

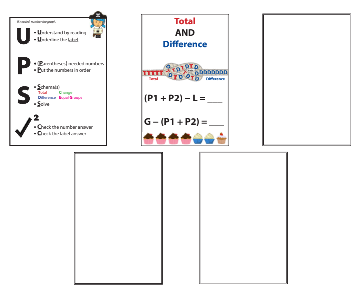


We have talked about word problems that are Total problems. We also have talked about word problems that are Difference problems. Today, we are going to learn something really cool! Do you want to know what we are going to learn?

(Responds.)

Today we are going to talk about word problems that are Total *and* Difference problems! Let me show you what I mean.

Display Multi-Step Word-Problem Schema Mat - Version 1.



Our program is called Pirate Math Equation Quest. Pirates use ropes like this one (point to the rope on the Total and Difference poster) **on their ships to power and lift their sails.**

What do you notice about the rope on this poster?

(Responds.)

Exactly! We see the word total with T's on one side of the rope. We see the word difference with D's on the other side of the rope.

What do you notice about the T's and D's in the center of the knot?

(Responds.)

Yes! The T's and D's are mixed together. This is to show that sometimes we have problems that are a mix of the Total and Difference schemas. Let me show you what I mean. I am going to show you the two examples of multi-step Total and Difference problems that you are most likely to see.

Point to A.

Let's read the first problem. "June ate 4 chocolate cupcakes and 2 vanilla cupcakes. She ate 1 strawberry cupcake. What is the difference between the combined number of chocolate and vanilla cupcakes and the number of strawberry cupcakes June ate?"

Circle 4, 2, and 1 in the story as you say the following:

This is a Total story because we are putting together or combining two parts: chocolate cupcakes and vanilla cupcakes. It says "combined number of chocolate and vanilla cupcakes." Combine tells us we are putting two amounts together: chocolate cupcakes and vanilla cupcakes (gesture)**.**

But this problem is not just a Total problem! Let's read our question again. It says, "What is the difference between the combined number of chocolate and vanilla cupcakes and the number of strawberry cupcakes June ate?"

What do you notice?

(Responds.)

Good thinking! It says, "What is the *difference*?" We see the word difference, which is a clue that we also have to compare to learn the difference! In Difference problems, we compare two amounts for a difference. In this problem, we are comparing the combined amount of chocolate and vanilla cupcakes June ate to the number of strawberry cupcakes June ate (gesture)**.**

When we have multi-step problems that include two schemas like this one, which has the Total and Difference schemas, we have new equations to help us solve the problem!

Can you read this equation aloud for me (point)**?**

(Responds.)

What do you notice about this equation (point to (P1 + P2) – L = __)**?**

(Responds.)

Wow! You really have your thinking cap on today! Nice work! Our problem is a Total problem *and* a Difference problem, so our equation is a Total and Difference equation combined!

We have (P1 + P2) – L = __.

What do P1 and P2 stand for?

Part 1 and part 2.

Exactly! P1 and P2 stand for part 1 and part 2, or the two amounts we are combining. In this problem, we are combining the number of chocolate cupcakes and vanilla cupcakes (gesture)**.**

And what does L stand for?

Amount that's less.

Excellent! L is the amount that's less. In this story, the amount that's less is the strawberry cupcake. We are comparing the combined amount of chocolate and vanilla cupcakes to the number of strawberry cupcakes (gesture)**.**

Do you notice anything else that is different or new in this equation?

There are parentheses.

Nice! The parentheses (point) **are first in the order of operations. All that means is that we need to add the numbers in parentheses FIRST when we solve this problem. What do parentheses mean?**

(Student.)

Exactly! Whatever you see in parentheses, you need to do first. What do you see in parentheses in this problem?

P1 and P2.

Right! So what does that mean?

We need to add P1 and P2 before we subtract L.

Nice! You need to add P1 and P2 before you subtract L.

Now before we practice solving multi-step Total and Difference problems, let's look at another example of a Total and Difference problem. This problem is similar to the problem we just read, but our equation is a little different.

Circle 4, 2, and 1 in the story as you say the following:

Let's read the second problem (point)**. "June ate 4 chocolate cupcakes and 2 vanilla cupcakes. She ate 1 strawberry cupcake. How many more chocolate cupcakes did June eat than vanilla and strawberry cupcakes?"**

What about this problem is *the same* as the first problem?

(Responds.)

Good job! Both problems are talking about cupcakes and both problems have the same numbers.

What about this problem is *different* from the first problem?

(Responds.)

Nice! In the first problem, we combined chocolate and vanilla cupcakes and compared them to strawberry cupcakes (gesture)**. In this problem, we combined vanilla and strawberry cupcakes and compared them to chocolate cupcakes** (gesture)**.**

Can you read the second equation for me (point to G – (P1 + P2) = __)**?**

(Responds.)

How is this equation (point to G – (P1 + P2) = __) **different from our first equation?**

(Responds.)

Excellent! In this equation, we have G, the amount that's greater, minus the combined amount of part 1 and part 2.

In the first problem, the combined amount of cupcakes is the amount that's greater, so we use the equation (P1 + P2) – L = __.

In the second problem, the combined amount of cupcakes is the amount that's less, so we use the equation G – (P1 + P2) = __.

We will talk more about the second equation the next time we meet. Today, I just want you to see that we choose between two equations when we have a multi-step problem that uses the Total and Difference schemas.

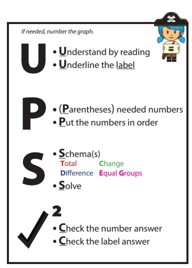
Remind me again, what do the parentheses mean?

(Responds.)

Awesome! Now, are you ready to practice solving a multi-step Total and Difference problem with me?

(Responds.)

Point to UPS Check^2 poster on the Multi-Step Word-Problem Schema Mat - Version 1.



Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

> *Frank used the following ingredients to make trail mix: 34 ounces of granola, 20 ounces of raisins, 16 ounces of chocolate chips. What was the difference between the combined amount of raisins and chocolate chips and the amount of granola Frank used?*
>
> *Problem Type:* *Total and Difference*
> *Equation:* *(P1 + P2) – L = __*
> *Relevant Information:* *P1 = 20; P2 = 16; L = 34*
> *Number Sentence:* *(20 + 16) – 34 = __*
> *Answer:* *__ = 2 (more) ounces*

Excellent! There is not a table or graph, so we are ready to follow our UPS $\mathbf{Check^2}$ steps.

To help us remember to use UPS $\mathbf{Check^2}$, let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "Frank used the following ingredients to make trail mix: 34 ounces of granola, 20 ounces of raisins, and 16 ounces of chocolate chips. What was the difference between the combined amount of raisins and chocolate chips and the amount of granola Frank used?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

(Responds.)

The problem asks us about the difference between the combined *amount* of raisins and chocolate chips and the *amount* of granola. Let's underline amount in our question sentence.

This label is a lot like problems where our label is money. We wouldn't write 5 money as an answer. Would we write 5 *amount* as an answer?

No.

Exactly. The amount in this problem refers to how much something weighs. Let's look at our numbers to see how we are measuring weight. What word do you see next to each of the numbers?

Ounces.

Great! Our label is ounces. Let's write ounces under amount in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 34. 34 is about ounces, so 34 is relevant. Let's put parentheses around 34 ounces of granola.

(Writes.)

What is our next number?

20.

Our next number is 20. 20 is about ounces, so 20 is relevant. Let's put parentheses around 20 ounces of raisins.

(Writes.)

What is our last number?

16.

Our last number is 16. 16 is about ounces, so 16 is relevant. Let's put parentheses around 16 ounces of chocolate chips.

All of the numbers in this problem are relevant because they are all about our label, ounces. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Exactly! Before today, we only worked single-step problems with a 1 above the numbers. Now, we are working multi-step problems, so we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

The problem says, "What was the difference between the combined amount of raisins and chocolate chips and the amount of granola Frank used?"

In this problem, we are first combining raisins and chocolate chips (gesture)**. Then, we are comparing the amount of raisins and chocolate chips to the amount of granola** (gesture)**. This problem is a lot like the first cupcake**

problem where we combined the chocolate and vanilla cupcakes and compared them to the strawberry cupcake.

If we are combining first, above which numbers should we put a 1?

Above 20 and 16.

Nice! First, Frank is combining the 20 ounces of raisins with the 16 ounces of chocolate chips, so let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 34.

Great! After we combine the raisins and chocolate chips, we need to compare the combined amount to the amount of granola. Let's put a 2 above 34 ounces of granola.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). Before today, our problems only had one schema. Today, we are learning about problems with two schemas!

What schemas have we been talking about today?

Total and Difference.

Exactly! We are learning about multi-step problems that include the Total and Difference schemas!

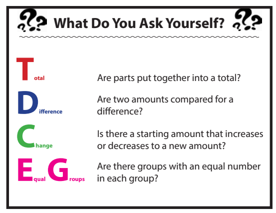
We know which schemas we are working with, but we need to figure out which schema we need to use first and which schema we need to use second.

What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Display What Do You Ask Yourself? poster.



Read the first two questions for Total and Difference and gesture with student.

First, we are combining raisins and chocolate chips (gesture)**. If we are combining, are we putting two parts together or comparing two amounts for a difference?**

Putting parts together.

Nice! If we are putting parts together, are we using the Total or Difference schema first?

Total.

To remind me to complete the Total step first, I write 1-T next to the problem. 1 stands for the first step of solving.

Write 1-T.

Now, we can move on to the second step of the problem.

What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster again to help us figure out

which schema we need to use second.

Read the first two questions and gesture with student.

After we combine raisins and chocolate chips, we compare the combined amount to the amount of granola (gesture)**. If we are comparing, are we using the Total or Difference schema second?**

Difference.

Good! Also, there's a clue in our question sentence. What's the clue?

The question asks, "What is the *difference*?"

Nice! To remind me to complete the Difference step second, I write 2-D next to the problem. 2 stands for the second step of solving.

Write 2-D.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Total and Difference poster.

Point to Total and Difference equations on the Multi-Step Word-Problem Schema Mat - Version 1.

When we worked the cupcake problems, we said if our combined amount is the amount that's greater, we use the first equation. If our combined amount is the amount that's less, we use the second equation.

We need to figure out if our combined amount is the amount that's greater or the amount that's less. To figure this out, let's look back at our numbers. If we combine 20 and 16, is that number going to be greater or less than 34?

(Responds.)

Guide students as needed.

You're right! Our combined amount is going to be greater and we need to compare it to a lesser amount, so let's use our first equation.

What's our first equation?

Our first equation is (P1 + P2) – L = __.

Good! Let's write it!

Write (P1 + P2) – L = __.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Total and Difference equation, we can plug in our numbers.

We said our first step was to combine raisins and chocolate chips. What numbers are talking about raisins and chocolate chips?

20 and 16.

Great! Let's put 20 and 16 under P1 and P2.

(Writes).

Check off 20 and write 20 underneath P1.
Check off 16 and write 16 underneath P2.

After we check off our numbers, we also can put a checkmark next to the 1-T as a reminder that we already have completed the Total step.

Check off 1-T.

Now we need to find L. We said our second step was to compare the combined amount of raisins and chocolate chips to the amount of granola. What number is talking about granola?

34.

Great! Let's put 34 under L because it's the amount that's less.

(Writes).

Check off 34 and write 34 underneath L.

After we check off the 34, we also can put a checkmark next to the 2-D as a reminder that we already have completed the Difference step.

Check off 2-D.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

20 + 16.

What's 20 + 16?

36.

Nice! Let's write 36 under 20 + 16 and bring down the minus 34.

(Writes.)

What do we need to do next to make both sides the same?

36 – 34.

What's 36 – 34?

2.

Yes. (20 + 16) – 34 is the same as 2. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 2.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a

label. We know that 2 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Ounces.

We underlined ounces, right here (point)**. We used the word ounces for our label. So, we write ounces after the number 2.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Frank used the following ingredients to make trail mix: 34 ounces of granola, 20 ounces of raisins, and 16 ounces of chocolate chips. What was the difference between the combined amount of raisins and chocolate chips and the amount of granola Frank used?"

Did we answer the question, "What was the difference between the combined amount of raisins and chocolate chips and the amount of granola Frank used?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is ounces.

What word did we underline in our question sentence?

Ounces.

Exactly. We underlined ounces. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Total and Difference problem! Let's try one more.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Ray has 14 blue shirts and 34 red shirts. Ray also has 22 pairs of pants. How many fewer pairs of pants does Ray have than shirts?

Problem Type:	*Total and Difference*
Equation:	*(P1 + P2) – L = __*
Relevant Information:	*P1 = 14; P2 = 34; L = 22*
Number Sentence:	*(14 + 34) – 22 = __*

Answer: *__ = 26 (fewer) pairs of pants*

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

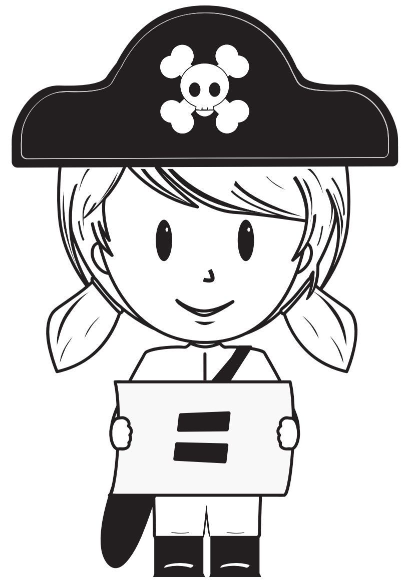
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 12

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Total and Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 12
Buccaneer Problems: Lesson 12
Jolly Roger Review: Lesson 12
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to do something a little different.

Point to A.

Do you notice anything that's different about this number sentence (point)**?**

(Responds.)

You're right! This number sentence has parentheses. What does this number sentence have?

Parentheses.

Exactly! Whenever you see parentheses, you need to complete the operation in parentheses before you do anything else. This is because parentheses come first in the order of operations.

What do parentheses mean?

(Responds.)

Right! Whatever we see in parentheses, we have to do first. We talked about this yesterday when we learned about multi-step Total and Difference problems. Remind me again, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Why?

Parentheses come first in the order of operations.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are not going to solve these problems (point)**. We are just going to talk about them and decide what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

This number sentence says, open parentheses 2 plus 3 closed parentheses plus

4 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Add.

How do you know?

There are two plus signs.

Nice! To solve this problem, we need to add. What do we need to add first?

(Responds.)

Exactly! We need to add 2 plus 3. Why do we need to add 2 plus 3 first?

Because there are parentheses around 2 plus 3. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 2 plus 3 first.

What do we need to do second?

(Responds.)

Yes! We need to add 4. Once you add 2 plus 3, you add 4. Now let's look at B (point)**.**

Point to B.

How are Problem B and Problem A the same?

Both problems have the plus sign and both problems have the same numbers.

Nice! Both problems have two plus signs and both problems have the numbers 2, 3, and 4.

How are Problem B and Problem A different?

The parentheses are in different places.

Exactly! In Problem A, the parentheses were around the numbers 2 and 3 (point)**. In Problem B, the parentheses are around the numbers 3 and 4** (point)**.**

Let's look at B and decide what we need to do first and what we need to do second. This number sentence says, 2 plus open parentheses 3 plus 4 closed parentheses is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Add.

How do you know?

There are two plus signs.

Nice! To solve this problem, we need to add. What do we need to add first?

(Responds.)

Exactly! We need to add 3 plus 4. Why do we need to add 3 plus 4 first?

Because there are parentheses around 3 plus 4. Whatever is in parentheses is what we have to do first.

What do we need to do second?

(Responds.)

Yes! We need to add 2. Once you add 3 plus 4, you add 2.

Let's look at two more addition equations with parentheses.

Solve C-D using the same dialogue as A-B.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

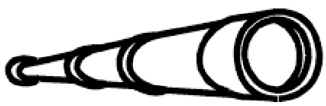
What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!



3: Buccaneer Problems

Yesterday we started talking about problems that are Total *and* Difference problems. We will continue solving multi-step Total and Difference problems today. Before we get started, let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

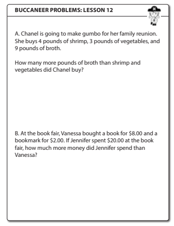
A number and a label.

Remind me, what did we start talking about yesterday?

(Responds.)

Today we are going to continue talking about word problems that are Total *and* Difference problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 12

A. Chanel is going to make gumbo for her family reunion. She buys 4 pounds of shrimp, 3 pounds of vegetables, and 9 pounds of broth.

How many more pounds of broth than shrimp and vegetables did Chanel buy?

B. At the book fair, Vanessa bought a book for $8.00 and a bookmark for $2.00. If Jennifer spent $20.00 at the book fair, how much more money did Jennifer spend than Vanessa?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

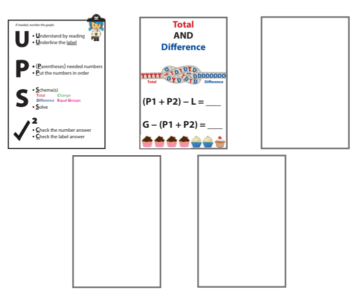
If you did see a table or a graph, what would you do?

Number it.

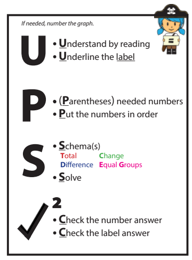
<u>*Solution to Problem A:*</u>

> *Chanel is going to make gumbo for her family reunion. She buys 4 pounds of shrimp, 3 pounds of vegetables, and 9 pounds of broth. How many more pounds of broth than shrimp and vegetables did Chanel buy?*
>
> *Problem Type:* *Total and Difference*
> *Equation:* *G – (P1 + P2) = __*
> *Relevant Information:* *G = 9; P1 = 4; P2 = 3*
> *Number Sentence:* *9 – (4 + 3) = __*
> *Answer:* *__ = 2 (more) pounds*

Display Multi-Step Word-Problem Schema Mat - Version 1.



Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 1.



There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "Chanel is going to make gumbo for her family reunion. She buys 4 pounds of shrimp, 3 pounds of vegetables, and 9 pounds of broth. How many more pounds of broth than shrimp and vegetables did Chanel buy?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

Pounds.

Great! Our label is pounds. Let's underline pounds in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 4. 4 is about pounds, so 4 is relevant. Let's put parentheses around 4 pounds of shrimp.

(Writes.)

What is our next number?

3.

Our next number is 3. 3 is about pounds, so 3 is relevant. Let's put parentheses around 3 pounds of vegetables.

(Writes.)

What is our last number?

9.

Our last number is 9. 9 is about pounds, so 9 is relevant. Let's put parentheses around 9 pounds of broth.

All of the numbers in this problem are relevant because they are all about our label, pounds. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Exactly! We are working multi-step problems, so we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "How many more pounds of broth than shrimp and vegetables did Chanel buy?"

In this problem, we are first combining shrimp and vegetables (gesture)**. Then, we are comparing the pounds of broth to the combined pounds of shrimp and vegetables** (gesture)**.**

If we are combining first, above which numbers should we put a 1?

Above 4 and 3.

Nice! First, we need to combine the 4 pounds of shrimp with the 3 pounds of vegetables, so let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 9.

Great! After we combine the pounds of shrimp and vegetables, we need to compare the pounds of broth to the combined pounds of shrimp and vegetables. Let's put a 2 above 9 pounds of broth.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about?

Total and Difference.

Exactly! We are learning about multi-step problems that include the Total and Difference schemas!

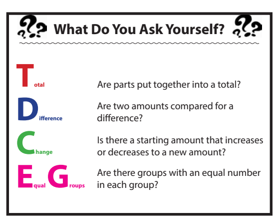
We know which schemas we are working with, but we need to figure out which schema we need to use first and which schema we need to use second.

What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Display What Do You Ask Yourself? poster.



Read the first two questions for Total and Difference and gesture with student.

First, we are combining pounds of shrimp and pounds of vegetables (gesture)**. If we are combining, are we putting two parts together or comparing two amounts for a difference?**

Putting parts together.

Nice! If we are putting parts together, are we using the Total or Difference schema first?

Total.

To remind me to complete the Total step first, I write 1-T next to the problem. 1 stands for the first step of solving.

Write 1-T.

Now, we can move on to the second schema.

What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster again to help us figure out which schema we need to use second.

Read the first two questions and gesture with student.

After we combine the pounds of shrimp and vegetables, we compare the pounds of broth to the combined pounds of shrimp and vegetables (gesture)**. If we are comparing, are we using the Total or Difference schema second?**

Difference.

Nice! To remind me to complete the Difference step second, I write 2-D next to the problem. 2 stands for the second step of solving.

Write 2-D.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Total and Difference poster.

Point to Total and Difference equations on the Multi-Step Word-Problem Schema Mat - Version 1.

When we worked the cupcake problems yesterday, we said if our combined amount is the amount that's greater, we use the first equation. If our combined amount is the amount that's less, we use the second equation (point)**.**

We need to figure out if our combined amount is the amount that's greater or the amount that's less. To figure this out, let's look back at our numbers. If we

combine 4 and 3, is that number going to be greater or less than 9?

(Responds.)

Guide student as needed.

You're right! Our combined amount is going to be the amount that's less, so let's use our second equation.

What's our second equation?

Our second equation is G – (P1 + P2) = ___.

Good! Let's write it!

Write G – (P1 + P2) = ___.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Total and Difference equation, we can plug in our numbers.

We said our first step was to combine the pounds of shrimp and the pounds of vegetables. What numbers are talking about shrimp and vegetables?

4 and 3.

Great! Let's put 4 and 3 under P1 and P2.

(Writes).

Check off 4 and write 4 underneath P1.
Check off 3 and write 3 underneath P2.

After we check off our numbers, we also can put a checkmark next to the 1-T as a reminder that we already have completed the Total step.

Check off 1-T.

Now we need to find G. We said our second step was to compare the pounds of broth to the combined pounds of shrimp and vegetables. What number is talking about pounds of broth?

9.

Great! Let's put 9 under G because it's the amount that's greater.

(Writes).

Check off 9 and write 9 underneath G.

After we check off the 9, we also can put a checkmark next to the 2-D as a reminder that we already have completed the Difference step.

Check off 2-D.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

4 + 3.

What's 4 + 3?

7.

Nice! Let's write 7 under 4 + 3 and bring down the 9 minus.

(Writes.)

What do we need to do next to make both sides the same?

9 – 7.

What's 9 – 7?

2.

Yes. 9 – (4 + 3) is the same as 2. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 2.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 2 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Pounds.

We underlined pounds, right here (point)**. We used the word pounds for our label. So, we write pounds after the number 2.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Chanel is going to make gumbo for her family reunion. She buys 4 pounds of shrimp, 3 pounds of vegetables, and 9 pounds of broth. How many more pounds of broth than shrimp and vegetables did Chanel buy?"

Did we answer the question, "How many more pounds of broth than shrimp and vegetables did Chanel buy?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is pounds.

What word did we underline in our question sentence?

Pounds.

Exactly. We underlined pounds. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Total and Difference problem! Let's try another.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

At the book fair, Vanessa bought a book for $8.00 and a bookmark for $2.00. If Jennifer spent $20.00 at the book store, how much more money did Jennifer spend than Vanessa?

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2) = __*
Relevant Information:	*G = 20; P1 = 8; P2 = 2*
Number Sentence:	*20 – (8 + 2) = __*
Answer:	*__ = 10 (more) dollars*

Follow the step-by-step dialogue for Problem A.
Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2) = __.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

Julie is making soup. She uses 3 pounds of carrots, 3 pounds of onions, and 7 pounds of chicken. How many more pounds of chicken than vegetables did Julie use?

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2) = __*
Relevant Information:	*G = 7; P1 = 3; P2 = 3*
Number Sentence:	*7 – (3 + 3) = __*
Answer:	*__ = 1 (more) pound*

Follow the step-by-step dialogue for Problem A.

Review with student that the combined amount is the amount that's less, so we need to use the equation $G - (P1 + P2) = \_\_$.
Review with student that carrots and onions are both vegetables.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

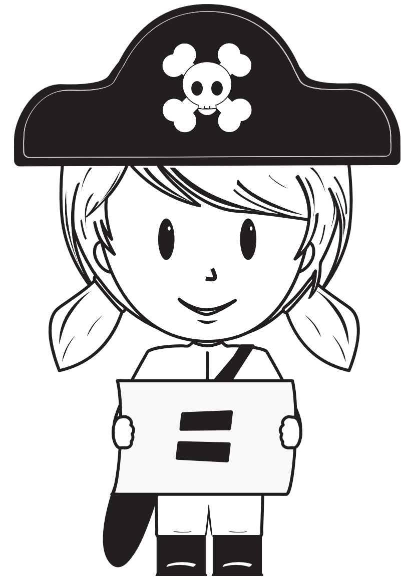
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 13

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Total and Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 13
Buccaneer Problems: Lesson 13
Jolly Roger Review: Lesson 13
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Yesterday we started talking about addition equations with parentheses. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are not going to solve these problems (point)**. We are just going to talk about them and decide what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 12 minus 6 closed parentheses minus 4 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Subtract.

How do you know?

There are two minus signs.

Nice! To solve this problem, we need to subtract. What do we need to subtract first?

(Responds.)

Exactly! We need to subtract 12 minus 6. Why do we need to subtract 12 minus 6 first?

Because there are parentheses around the 12 minus 6. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 12 minus 6 first.

What do we need to do second?

(Responds.)

Yes! We need to subtract 4. Once you subtract 12 minus 6, you subtract 4. Now let's look at B (point)**.**

Point to B.

How are Problem B and Problem A the same?

Both problems have the minus sign and both problems have the same numbers.

Nice! Both problems have two minus signs and both problems have the numbers 12, 6, and 4.

How are Problem B and Problem A different?

The parentheses are in different places.

Exactly! In Problem A, the parentheses were around the numbers 12 and 6 (point)**. In Problem B, the parentheses are around the numbers 6 and 4** (point)**.**

Let's look at B and decide what we need to do first and what we need to do second. This number sentence says 12 minus open parentheses 6 minus 4 closed parentheses is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Subtract.

How do you know?

There are two minus signs.

Nice! To solve this problem, we need to subtract. What do we need to subtract first?

(Responds.)

Exactly! We need to subtract 6 minus 4. Why do we need to subtract 6 minus 4 first?

Because there are parentheses around 6 minus 4. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 6 minus 4.

What do we need to do second?

(Responds.)

Yes! We need to subtract the difference of 6 minus 4 from 12.

Let's look at two more subtraction equations with parentheses.

Solve C-D using the same dialogue as A-B.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

We have been talking about problems that are Total *and* Difference problems. We will continue solving multi-step Total and Difference problems today. Before we get started, let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

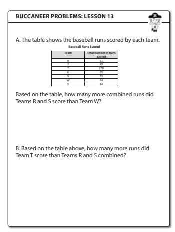
A number and a label.

Remind me, what is a multi-step Total and Difference problem?

(Responds.)

Exactly! A multi-step Total and Difference problem includes the Total and Difference schemas. Today we are going to continue talking about word problems that are Total *and* Difference problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 13

A. The table shows the baseball runs scored by each team.

Baseball Runs Scored

Team	Total Number of Runs Scored
R	61
S	92
T	270
U	65
V	72
W	64
X	84

Based on the table, how many more combined runs did Teams R and S score than Team W?

B. Based on the table above, how many more runs did Team T score than Teams R and S combined?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We see a table, but it's already numbered so we are ready to follow our UPS Check^2 steps.

Solution to Problem A:

The table shows the baseball runs scored by each team. Based on the table, how many more combined runs did Teams R and S score than Team W?

Problem Type:	*Total and Difference*
Equation:	*(P1 + P2) – L = __*
Relevant Information:	*P1 = 61; P2 = 92; L = 64*
Irrelevant Information:	~~*Team T, Team U, Team V, Team X*~~
Number Sentence:	*(61 + 92) – 64 = __*
Answer:	*__ = 89 (more) runs*

Follow the step-by-step dialogue for Lesson 11, Problem B.
Review with student that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2) – L = __.
Make sure the student lightly crosses out the irrelevant information as Team T is needed to solve Problem B.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We see a table. We will use the same table from Problem A to help us solve Problem B. The table already is numbered so we are ready to follow our UPS Check² steps.

Solution to Problem B:

Based on the table above, how many more runs did Team T score than Teams R and S combined?

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2) = __*
Relevant Information:	*G = 270; P1 = 61; P2 = 92*
Irrelevant Information:	~~*Team U, Team V, Team W, Team X*~~
Number Sentence:	*270 – (61 + 92) = __*
Answer:	*__ = 117 (more) runs*

Follow the step-by-step dialogue for Lesson 12, Problems A-C.

Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2) = __.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

We don't see a table or graph, but we see figures and a key that says one square equals 1 square centimeter. We will refer back to this key as we solve the problem.

<u>Solution to Problem C:</u>

> *Felix drew the rectangles below with some of the equal-sized squares placed as shown. The remainder of the rectangles will be covered with equal-sized squares. The perimeter of Rectangle X is 26 square centimeters. How much less is the perimeter of Rectangle V than Rectangle X?*

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2 + P3 + P4) = __*
Relevant Information:	*G = 26; P1 = 6; P2 = 6; P3 = 6; P4 = 6*
Irrelevant Information:	~~*Rectangle W, Rectangle Y, Rectangle Z*~~
Number Sentence:	*26 – (6 + 6 + 6 + 6) = __*
Answer:	*__ = 2 square centimeters*

Follow the step-by-step dialogue for Lesson 12, Problems A-C.
Review with student that there are 4 parts, so we need to add a P3 and P4.
Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2 + P3 + P4) = __.
Review with student that Rectangle V is a square, so all of the sides are the same length.
Review with student that we find the perimeter of a figure by adding all of the sides.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

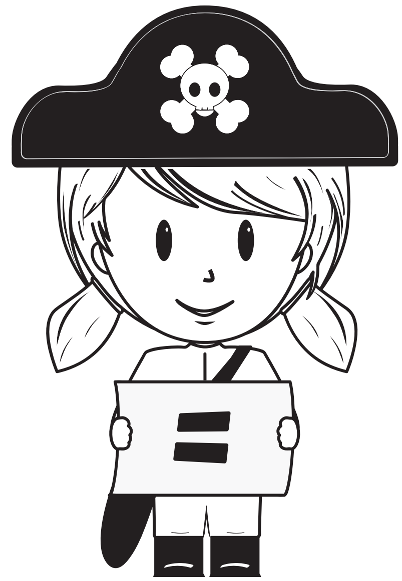
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 14

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Change with end missing
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
Large Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 14
Buccaneer Problems: Lesson 14
Jolly Roger Review: Lesson 14
Treasure Map

Tutor Materials

Crayons
Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been talking about addition and subtraction equations with parentheses. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 2 plus 1 closed parentheses plus 6 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Add.

How do you know?

There are two plus signs.

Nice! To solve this problem, we need to add. What do we need to add first?

(Responds.)

Exactly! We need to add 2 plus 1. Why do we need to add 2 plus 1 first?

Because there are parentheses around the 2 plus 1. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 2 plus 1 first. Let's go ahead and add. What's 2 plus 1?

3.

Yes! 2 plus 1 is the same as 3. Let's write 3 underneath the 2 plus 1.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add 3 plus 6. What is 3 plus 6?

9.

Nice! So open parentheses 2 plus 1 closed parentheses plus 6 is *the same as* what?

9.

Nice work! Go ahead and write the sum.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total and Difference problems. We also have talked about multi-step Total and Difference problems. When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total (gesture)**. Sometimes the missing information is the total. Other times, the missing information is one of the parts.**

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference (gesture)**.**

Today, we'll learn about a new type of problem. We call these Change problems.

Change problems tell us a starting amount (put one hand at chin level) **. Then, something happens to increase** (raise hand up to forehead) **or decrease** (lower hand down to chest) **the amount we started with. What does the word *increase* mean?**

To make bigger.

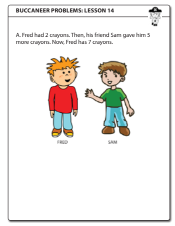
Yes, the word *increase* means to make bigger or more. What does the word *decrease* mean?

To make smaller.

Great. The word *decrease* means to make smaller or less. So, Change problems tell us a starting amount. At a different time, something happens to make the amount you started with bigger or smaller.

Look at this problem.

Point to A.



"Fred had 2 crayons. Then, his friend Sam gave him 5 more crayons. Now, Fred has 7 crayons."

This is a Change story because the story tells us the number of crayons Fred started with. Then his friend, Sam, changed Fred's amount by giving Fred some more. So Fred ends with a new number of crayons.

Circle 2, 5, and 7 in the story.

Here's the number sentence that goes with this story: 2 plus 5 is the same as 7.

Write 2 + 5 = 7.

This number sentence stands for what's happening in this Change story. Fred starts with 2 crayons. Then something happens to change Fred's amount. What happens?

His friend gives him more.

Right. His friend gives him 5 more. So Fred ends with 7. That's like the number sentence: 2 plus 5 is the same as 7. Let me show you how this works.

This is a picture of Fred (point)**. Fred's name is written here** (point)**. How many crayons should Fred start with?**

2.

That's right. Let's count 2 crayons. 1, 2. I'll put them here under Fred's picture.

Place 2 crayons under Fred's picture.

This is Fred's friend, Sam. Sam's name is written here (point)**. How many crayons should the friend have?**

5.

That's kind of right. We know Sam has at least 5 crayons because that's how many Sam gives to Fred. I'll give him a bunch of crayons because we don't know how many his friend has exactly. I'll put them here under Sam's picture.

Place approximately 7-10 crayons under Sam's picture.

The story says Fred has 2 crayons. That means 2 is how many crayons Fred starts with (point)**.**

In Change problems, the story tells us a starting amount. At a different time, something happens to change the starting amount. We end with a new amount. In this problem, Fred's 2 crayons is the starting amount. What happens to change the starting amount?

His friend gives him some.

Right. The change amount is how many his friend Sam gives him (point)**. How many does the story say his friend gives him?**

5.

Good. If Fred gets 5 crayons from his friend, does his amount increase or decrease?

Increase.

Good. To find the new amount, we start with 2. When his friend Sam gives him 5 more, the starting amount increases by 5. I'll take 5 crayons from Sam and give them to Fred.

Count 5 crayons one at a time as the "friend" gives "Fred" 5 and put them under Fred.

Let's review. Fred starts with 2. Then Sam gives him 5. The starting amount *increases* when the friend gives him 5 more (gesture)**.**

So I ADD. Fred's 2 crayons plus the 5 crayons Sam gave him makes 7. Fred ends with 7 crayons. This is like the number sentence 2 plus 5 is the same as 7. (Point to 2 + 5 = 7.)

When a Change problem increases, I have a starting amount. Then I add the change amount. This gives me the end amount (gesture)**.**

Take 2 crayons from underneath Fred and place them under the 2 in the number sentence. Then take the remaining 5 crayons and place them under the 5 in the number sentence.

The Change equation for this problem is ST plus C is the same as E.

Write ST + C = E.

ST (point) **stands for the starting amount. C** (point) **stands for the change amount. And E** (point) **stands for the end amount.**

What does ST (point) **stand for?**

The starting amount.

What does C (point) **stand for?**

The change amount.

What does E (point) **stand for?**

The end amount.

Sometimes the Change equation has a plus sign. Other times, it has a minus sign. If the change amount is increasing, we use a plus sign. If the change amount is decreasing, we use a minus sign. Let me show you what I mean.

Point to B.

"Harry had 9 crayons. Then he gave 3 crayons to Will. Now, Harry has 6 crayons."

This is a Change story because it tells us the number of crayons Harry started

with. Then something happened to change the amount he started with. What happened?

He gave some crayons to Will.

Yes. That's what happened. Harry gave some crayons to Will. Did this increase or decrease the number of crayons Harry started with?

Decrease.

That's right. He gave crayons away. This decreased the number of crayons Harry had. Harry ends with less crayons.

Circle 9, 3, and 6 in the story.

Here's the number sentence that goes with this story: 9 minus 3 is the same as 6.

Write 9 – 3 = 6.

This number sentence stands for what's happening in this Change story. Harry starts with 9 crayons. Then something happens to change his amount. What happens?

He gives some to Will.

Right. He gives some to Will. So Harry ends up with 6 crayons. That's like the number sentence: 9 minus 3 is the same as 6. Let me show you how this works.

This is Harry (point)**. Harry's name is here** (point)**. How many crayons does Harry start with?**

9.

That's right. Let's count 9 crayons. 1, 2, 3, 4, 5, 6, 7, 8, 9. I'll put them here, under Harry's picture.

This is Will (point)**. How many crayons does Will have?**

0.

That's right. Will doesn't have any crayons yet.

In Change problems, the story tells us a starting amount. At a different time, something happens to change the starting amount. So we end with a new amount. In this problem, Harry starts with 9 crayons (point)**. What happens to change this starting amount?**

He gives some to Will.

Right. The change amount is how many Harry gives to Will. How many does the story say Harry gives to Will?

3.

Good. When Harry gives 3 crayons to Will, does his number of crayons increase or decrease?

Decrease.

Good. When Harry gives crayons away, his number of crayons decreases. So he ends up with a new amount. To find the new amount, we start with 9 and then Harry gives 3 crayons to Will.

Take 3 crayons from underneath Harry's picture and place them under Will's picture.

So I SUBTRACT. 9 crayons minus the 3 crayons he gave away. 9 minus 3 is the same as 6. So Harry ends with 6 crayons (count 6 crayons under Harry's picture)**. This is like the number sentence 9 minus 3 is the same as 6** (Point to 9 – 3 = 6)**.**

When a Change problem decreases, I have a starting amount. Then I subtract the change amount. This gives me the end amount (gesture)**.**

The Change equation for this problem is ST minus C is the same as E.

Write ST – C = E.

Remind me. What does ST stand for?

The starting amount.

What does C (point) **stand for?**

The change amount.

What does E (point) **stand for?**

The end amount.

Sometimes the Change equation has a plus sign. Other times, it has a minus sign. If the change amount is increasing, we use a plus sign. If the change amount is decreasing, we use a minus sign.

You earn a treasure coin!

Let's practice solving a Change problem!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Sebastian went bowling with his friends. During the first game, he earned 75 points. Then, he earned 128 more points in the second game. How many points has Sebastian earned now?

Problem Type:	*Change, increase*
Relevant Information:	*ST = 75; C = 128; E = __*
Number Sentence:	*75 + 128 = __*
Answer:	*__ = 203 points*

Follow steps on the UPS Check^2 poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to name the schema. Before today, we only knew about Total and Difference problems. If you think it's a Total problem, ask yourself: Are parts put together into a total? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**?**

In Change problems, the story tells us a starting amount. Something happens in the story to CHANGE the starting amount. If you think it's a Change problem, ask yourself: Does a starting amount increase or decrease to a new amount (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount?

Great job! In Change problems, the starting amount can <u>increase</u>, which means we add, or the starting amount can <u>decrease</u>, which means we subtract.

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount (gesture)**?**

Let's read the problem again.

"Sebastian went bowling with his friends. During the first game, he earned 75 points. Then, he earned 128 more points in the second game. How many points has Sebastian earned now?"

This problem talks about points: Sebastian earned 75 points, then he earned 128 more points. The question asks how many points Sebastian has earned now. Is this a Total, Difference, or a Change problem?

Change.

This problem is a Change problem because the problem tells us a starting amount: the number of points Sebastian earned in the first game. Then, something happens to change the amount. What happens?

He earns more points in the second game.

Good. Sebastian earned more points in the second game. If Sebastian earned more points, did the starting amount increase or decrease?

Increase.

Right. To remind me it's a Change problem, I write 1-C next to the problem. 1 stands for the first step of solving. C stands for Change problem.

Write 1-C.

Now, Sebastian earned 75 points. Then, he earned 128 more points. It's a starting amount that increases. If it's increasing, do we add or subtract?

Add.

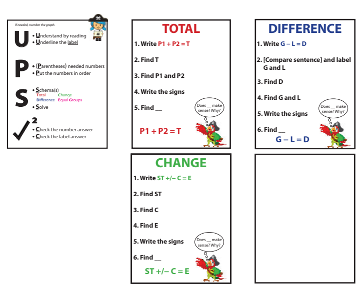
Right. Do we use a plus or a minus sign?

Plus sign.

Good. We use a plus sign. I write the plus sign before C to remind me it's a Change problem that increases. I put the plus sign to remind me to add.

Write + next to C.

Display Large Schema Mat - Version 3 with Change poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Change problem, you're ready to solve it! We decided this is a Change problem, so we use this Change poster to solve it. This is the Change poster (point)**. We'll use it to help organize your work. To solve a Change problem, we have six steps. The steps are a lot like the Total and Difference steps.**

Step 1 is to write the Change equation. We write ST plus C is the same as E OR ST minus C is the same as E. The sign depends on whether the change is increasing or decreasing. Does this problem have an increase or decrease?

Increase.

That's right. The change increases. That's why we wrote a plus sign next to the C. If we wrote a plus sign, we use the Change equation ST plus C is the same as E.

We need to write the Change equation now.

Write ST + C = E.

Step 2: "Find ST." We have to decide the starting amount. Look at the problem. Does it tell us the starting amount of points Sebastian earned?

Yes.

How many points did Sebastian earn in the first game?

75.

The starting amount, or ST, is 75. I check off the 75 and write 75 underneath ST.

Check off 75 in the story and write 75 underneath ST.

Step 3: "Find C." We have to decide the change amount. Sometimes the

problem will tell us the change amount. Other times, the change amount is missing. Look at the problem. Does it tell about a change to the number of points Sebastian earned?

Yes.

How many points did Sebastian earn in the second game?

128.

That's right. Sebastian earned 128 points in the second game. If he earned more points, this describes a change in the number of points. So, the change amount, or C, is 128. I check off the 128 and write 128 underneath C.

Check off 128 in the story and write 128 underneath C.

Step 4 says: "Find E." We have to decide the end amount. Sometimes the problem tells us the end amount. Other times, the end amount is missing. Look at the problem. Does it tell about the end number of points Sebastian earned?

No.

The question asks, "How many points has Sebastian earned now?" We have to find the end amount of points. How do we mark missing information?

With a blank.

Right. We're missing the end amount, so I put blank underneath E.

Write blank underneath E.

Step 5: "Write the signs." Change problems can have a plus sign or a minus sign. In this problem, we said the starting amount increased. To help us remember this, we wrote ST plus C is the same as E when we wrote the Change equation. This means we use a plus sign and the same as sign to complete the number sentence.

Write the plus sign and the same as sign.

75 stands for the starting amount. 128 stands for the change. Blank stands for

the end amount. Does this (point) **look like a number sentence we know how to solve?**

Yes!

Let's find blank! You know how to do this!

Do you add or subtract?

Add.

That's right. You can just add 75 plus 128 to find the sum.

(Adds.)

Blank is the same as 203.

In word problems, our answer must have a number and a label. We know the number answer is 203. Now we have to figure out what the label for 203 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Points.

Right! The question is asking about points, so that's the best label. We write points for the label! Points is the word that tells us about our missing information.

Write "points" next to 203.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to

make sure it makes sense.

Is our sum reasonable?

Yes!

Nice! Our we know our sum makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is points.

What word did we underline in our question sentence?

Points.

Exactly. We underlined points. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Change problem!

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

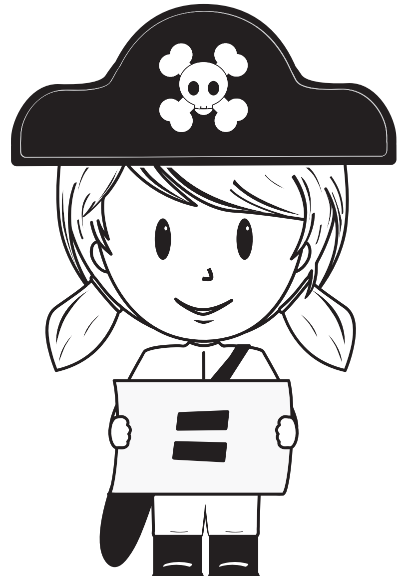
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 15

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Total, Difference, and Change
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Large Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 15
Buccaneer Problems: Lesson 15
Jolly Roger Review: Lesson 15
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been talking about addition and subtraction equations with parentheses. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 5 plus 3 closed parentheses plus 9 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Add.

How do you know?

There are two plus signs.

Nice! To solve this problem, we need to add. What do we need to add first?

(Responds.)

Exactly! We need to add 5 plus 3. Why do we need to add 5 plus 3 first?

Because there are parentheses around the 5 plus 3. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 5 plus 3 first. Let's go ahead and add. What's 5 plus 3?

8.

Yes! 5 plus 3 is the same as 8. Let's write 8 underneath the 5 plus 3.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add 8 plus 9. What is 8 plus 9? Use the Counting Up poster if needed.

17.

Nice! So open parentheses 5 plus 3 closed parentheses plus 9 is *the same as* what?

17.

Nice work! Go ahead and write the sum.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Now say the Difference equation.

G – L = D.

Good. Say it again.

G – L = D.

Yesterday we learned about Change problems. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. You have to decide which Change equation to use. What are the two Change equations?**

ST + C = E and ST – C = E.

The past few weeks, we've learned about Total and Difference problems. When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total (gesture)**. Sometimes the missing information is the total. Other times, the missing information is one of the parts.**

How do you know if a problem is a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference (gesture)**.**

In Change problems, we have a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. What does the word *increase* mean?**

To make bigger.

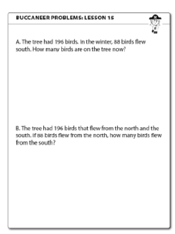
Yes, the word *increase* means to make bigger or more. What does the word *decrease* mean?

To make smaller.

Great. The word *decrease* means to make smaller or less. So, Change problems tell us a starting amount. At a different time, something happens to make the amount you started with bigger or smaller.

Look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 15

A. The tree had 196 birds. In the winter, 88 birds flew south. How many birds are on the tree now?

B. The tree had 196 birds that flew from the north and the south. If 88 birds flew from the north, how many birds flew from the south?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem A:*</u>

The tree had 196 birds. In the winter, 88 birds flew south. How many birds are on the tree now?

Problem Type:	*Change, decrease*
Relevant Information:	*ST = 196; C = 88; E = __*
Number Sentence:	*196 – 88 = __*
Answer:	*__ = 108 birds*

Follow steps on the UPS Check^2 poster.
When you get to the first "S" follow script below.

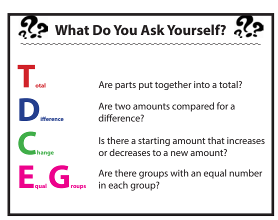
Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Before yesterday, we only knew about Total and Difference problems. Now that we know 3 schemas, let's use our What Do You Ask Yourself? poster (point) **to help us identify the schema.**

Display What Do You Ask Yourself? poster.
Cover up Equal Groups question.



If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference** (gesture)**?**

What's a Change problem?

(Responds.)

In Change problems, the story tells us a starting amount. Something happens in the story to CHANGE the starting amount. If you think it's a Change problem, ask yourself: Does a starting amount increase or decrease to a new amount (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount?

Great job! In Change problems, the starting amount can <u>increase</u>, which means we add (gesture)**, or the starting amount can <u>decrease</u>, which means we subtract** (gesture)**.**

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount (gesture throughout questioning)**?**

(Responds.)

Let's read the problem again.

"The tree had 196 birds. In the winter, 88 birds flew south. How many birds are on the tree now?"

This problem talks about birds: The tree had 196 birds, then 88 birds flew south. The question asks how many birds are on the tree now. Is this a Total, Difference, or a Change problem?

Change.

This problem is a Change problem because the problem tells us a starting amount: the number of birds on the tree (gesture)**. Then, something happens to change the amount. What happens?**

In the winter, 88 birds flew south.

Good. Birds flew south. If birds flew south, did the starting amount increase or decrease (gesture)**?**

Decrease.

Right. To remind me it's a Change problem, I write 1-C next to the problem. 1 stands for the first step of solving. C stands for Change problem.

Write 1-C.

Now, the tree had 196 birds. Then, 88 birds flew south. It's a starting amount that decreases. If it's decreasing, do we add or subtract?

Subtract.

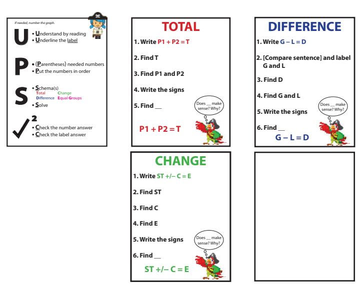
Right. Do we use a plus or a minus sign?

Minus sign.

Good. We use a minus sign. I write the minus sign before C to remind me it's a Change problem that decreases. I put the minus sign to remind me to subtract.

Write – next to C.

Display Large Schema Mat - Version 3 with Change poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Change problem, you're ready to solve it! We decided this is a Change problem, so we use this Change poster to solve it. This is the Change poster (point)**. We'll use it**

to help organize your work. To solve a Change problem, we have six steps. The steps are a lot like the Total and Difference steps.

Step 1 is to write the Change equation. We write ST plus C is the same as E OR ST minus C is the same as E. The sign depends on whether the change is increasing or decreasing. Does this problem have an increase or decrease?

Decrease.

That's right. The change decreases. That's why we wrote a minus sign next to the C. If we wrote a minus sign, we use the Change equation ST minus C is the same as E.

We need to write the Change equation now.

Write ST – C = E.

Step 2: "Find ST." We have to decide the starting amount. Look at the problem. Does it tell us the starting amount of birds on the tree?

Yes.

How many birds were on the tree to start?

196.

The starting amount, or ST, is 196. I check off the 196 and write 196 underneath ST.

Check off 196 in the story and write 196 underneath ST.

Step 3: "Find C." We have to decide the change amount. Sometimes the problem will tell us the change amount. Other times, the change amount is missing. Look at the problem. Does it tell about a change to the number of birds on the tree?

Yes.

How many birds flew south?

88.

That's right. 88 birds flew south. If birds flew south, this describes a change in the number of birds on the tree. So, the change amount, or C, is 88. I check off the 88 and write 88 underneath C.

Check off 88 in the story and write 88 underneath C.

Step 4 says: "Find E." We have to decide the end amount. Sometimes the problem tells us the end amount. Other times, the end amount is missing. Look at the problem. Does it tell about the end number of birds on the tree?

No.

The question asks, "How many birds are on the tree now?" We have to find the end amount of birds. How do we mark missing information?

With a blank.

Right. We're missing the end amount, so I put blank underneath E.

Write blank underneath E.

Step 5: "Write the signs." Change problems can have a plus sign or a minus sign. In this problem, we said the starting amount decreased. To help us remember this, we wrote ST minus C is the same as E when we wrote the Change equation. This means we use a minus sign and the same as sign to complete the number sentence.

Write the minus sign and the same as sign.

196 stands for the starting amount. 88 stands for the change. Blank stands for the end amount. Does this (point) **look like a number sentence we know how to solve?**

Yes!

Let's find blank! You know how to do this!

Do you add or subtract?

Subtract.

That's right. You can just subtract 196 minus 88 to find the difference.

(Subtracts.)

Blank is the same as 108.

In word problems, our answer must have a number and a label. We know the number answer is 108. Now we have to figure out what the label for 108 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Birds.

Right! The question is asking about birds, so that's the best label. We write birds for the label! Birds is the word that tells us about our missing information.

Write "birds" next to 108.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our difference reasonable?

Yes!

Nice! Our we know our difference makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is birds.

What word did we underline in our question sentence?

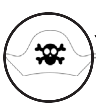
Birds.

Exactly. We underlined birds. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Change problem!

 **You earn a treasure coin!**

Point to B.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

The tree had 196 birds that flew from the north and the south. If 88 birds flew from the north, how many birds flew from the south?

Problem Type: *Total, two parts*

Relevant Info: *P1 = 88; P2 = __; T = 196*
Number Sentence: *88 + __ = 196*
Answer: *__ = 108 birds*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

Look back at Problem A. Now look at Problem B. How are these problems the same? How are they different?

They are the same because they are both about birds and they both have the same numbers. They are different because the questions are not the same.

Good. The questions are different. The question in Problem B says, "If 88 birds flew from the north, how many birds flew from the south?"

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**?**

If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**?**

If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount (gesture)**?**

In Problem A, there were birds and then some birds flew away. There was a Change decrease. We knew that from the question: "How many birds are on the tree now?"

In Problem B, the question says, "If 88 birds flew from the north, how many birds flew from the south?" Does this question talk about a change that increases or decreases?

No.

In Problem B, the question doesn't ask us about a change. Does the question ask us to put birds together into a total or compare birds to find the difference?

Put birds together for a total.

Good! The question is, "If 88 birds flew from the north, how many birds flew from the south?" This means we are putting together the birds that flew from the north and the birds that flew from the south into a total (gesture)**. The parts are the birds that flew from the north and the birds that flew from the south** (gesture)**. It's a Total problem.**

Write 1-T.

Continue solving the problem by follow the remainder of the steps on the UPS Check^2 poster.

Point to C.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

The tree had 108 birds that flew from the south and 88 birds that flew from the north. How many fewer birds flew from the north?

Problem Type:	*Difference*
Relevant Info:	*G = 108; L = 88; D = __*
Number Sentence:	*108 – 88 = __*
Answer:	*__ = 20 birds*

Follow steps on the UPS Check^2 poster.
When you get to the first "S" follow script below.

Point to the first S.

Look back at Problems A and B. Now look at Problem C. How are these problems the same? How are they different?

They are the same because they are all about birds and they all have the same numbers. They are different because the questions are not the same.

Good. The questions are different. The question in Problem C says, "How many fewer birds flew from the north?"

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**?**

If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**?**

If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount (gesture)**?**

In Problem A, there were birds and then some birds flew away. There was a Change decrease. We knew that from the question: "How many birds are on the tree now?"

In Problem B, we put together the birds from the north and the birds from the south. It was a Total problem. We knew that from the question: "If 88 birds flew from the north, how many birds flew from the south?"

In Problem C, the question says, "How many fewer birds flew from the north?" Does this question talk about a Change that increases or decreases?

No.

In Problem C, the question doesn't ask us about a change. Does the question ask us to put birds together into a total or compare birds to find the difference?

Compare birds to find the difference.

Good! The question is, "How many fewer birds flew from the north?" This means we are comparing the birds that flew from the north to the birds that flew from the south (gesture)**. It's a Difference problem.**

Write 1-D.

Continue solving the problem by follow the remainder of the steps on the UPS Check^2 poster.
Review the compare sentence and G and L with student.

Let's look at the problems we worked on today. All the problems were about birds. But the problems were different problem types.

What kind of problem is Problem A?

(Responds.)

Right! Problem A (point) **is a Change decrease problem. The number of birds <u>changed</u> when some of the birds flew south.**

What kind of problem is Problem B?

(Responds.)

Right! Problem B (point) **is a Total problem. The problem <u>put together</u> the birds when it told us there were 196 birds that flew from the north and the south.**

What kind of problem is Problem C?

(Responds.)

Exactly! Problem C is a Difference problem. The problem <u>compared</u> the number of birds that flew from the north to the number of birds that flew from the south when it told us that fewer (emphasize *fewer*) **birds flew from the south.**

Every time you identify the schema, you have to think: Is this a Total, Difference, or Change problem? When you identify the schema, look at the question first. If the question doesn't give you a clue about the problem type, look at the whole story. Picture it in your head. Think: Is this a Total, Difference, or Change problem? Ask yourself our questions to help decide.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

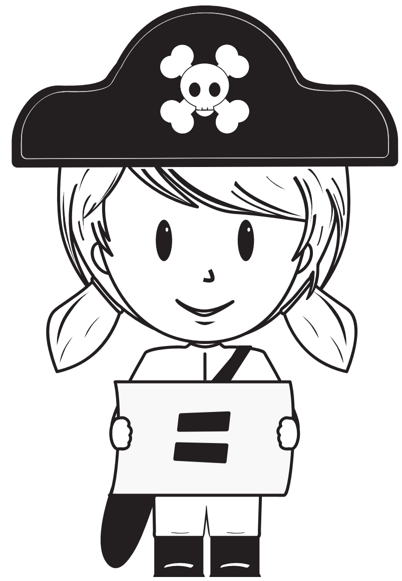
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 16

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Change with start or change missing
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Large Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 16
Buccaneer Problems: Lesson 16
Jolly Roger Review: Lesson 16
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been talking about addition and subtraction equations with parentheses. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 11 minus 3 closed parentheses minus 1 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Subtract.

How do you know?

There are two minus signs.

Nice! To solve this problem, we need to subtract. What do we need to subtract first?

(Responds.)

Exactly! We need to subtract 11 minus 3. Why do we need to subtract 11 minus 3 first?

Because there are parentheses around the 11 minus 3. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 11 minus 3 first. Let's go ahead and subtract. What's 11 minus 3? Use the Counting Up poster if needed.

8.

Yes! 11 minus 3 is the same as 8. Let's write 8 underneath the 11 minus 3.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract 8 minus 1. What is 8 minus 1? Use the Counting Up poster if needed.

7.

Nice! So open parentheses 11 minus 3 closed parentheses minus 1 is *the same as* what?

7.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Now say the Difference equation.

G – L = D.

Good. Say it again.

G – L = D.

Recently, we started talking about Change problems. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. You have to decide which Change equation to use. What are the two Change equations?**

ST + C = E and ST – C = E.

The past few weeks, we've learned about Total and Difference problems. When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total (gesture)**. Sometimes the missing information is the total. Other times, the missing**

information is one of the parts.

How do you know if a problem is a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference (gesture)**.**

In Change problems, we have a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. What does the word *increase* mean?**

To make bigger.

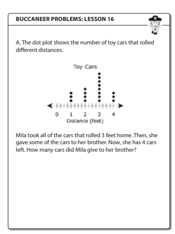
Yes, the word *increase* means to make bigger or more. What does the word *decrease* mean?

To make smaller.

Great. The word *decrease* means to make smaller or less. So, Change problems tell us a starting amount. At a different time, something happens to make the amount you started with bigger or smaller.

Look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 16

A. The dot plot shows the number of toy cars that rolled different distances.

Mila took all of the cars that rolled 3 feet home. Then, she gave some of the cars to her brother. Now, she has 4 cars left. How many cars did Mila give to her brother?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right! This graph is called a dot plot. To number a dot plot, we just need to count the number of dots above each number. What do we need to do?

Count the number of dots above each number.

Exactly! Let's go ahead and number our dot plot.

(Numbers.)

<u>Solution to Problem A:</u>

The dot plot shows the number of toy cars that rolled different distances. Mila took all of the cars that rolled 3 feet home. Then, she gave some of the cars to her brother. Now, she has 4 cars left. How many cars did Mila give to her brother?

Problem Type:	*Change, decrease*
Relevant Information:	*ST = 8; C = __; E = 4*
Irrelevant Information:	*~~Cars that rolled 1 foot, 2 feet, and 4 feet~~*
Number Sentence:	*8 – __ = 4*
Answer:	*__ = 4 cars*

Follow steps on the UPS Check² poster.
Cross out the irrelevant information during the first "P" step.
During the first "P" step, guide students to write (8 cars) above 3 feet home and remind them to use the 8 cars and not the 3 feet home as the starting amount.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total and Difference problems. Now we also know about Change problems. Let's use our What Do You Ask Yourself? poster to help us identify the schema.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference** (gesture)**?**

In Change problems, the story tells us a starting amount. Something happens in the story to CHANGE the starting amount. If you think it's a Change problem, ask yourself: Does a starting amount increase or decrease to a new amount (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount?

Great job! In Change problems, the starting amount can <u>increase</u>, which means we add (gesture)**, or the starting amount can <u>decrease</u>, which means we subtract** (gesture)**.**

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount (gesture throughout questioning)**?**

Let's read the problem again.

"Mila took all of the cars that rolled 3 feet home. Then, she gave some of the cars to her brother. Now, she has 4 cars left. How many cars did Mila give to her brother?"

This problem talks about cars: Mila took all of the cars that rolled 3 feet home, then she gave some of the cars to her brother. The question asks how many cars Mila gave to her brother. Is this a Total, Difference, or a Change problem?

Wait 10 seconds for student to think.

Change.

You're right! It's a Change problem. This problem is tricky to name. It's a Change problem, but it doesn't ask us for the end amount.

The problem starts with the cars that rolled 3 feet home. Then something happens to change that amount. What happens?

Mila gave some of the cars to her brother.

Right. This problem is about one thing that changes. Then the problem tells us she has 4 cars left. Does "4 left" tell us how many she gave to her brother?

No.

Right. That tells us the end amount, the amount Mila has left. This question asks how many she gave to her brother. It asks us to find the amount of the change.

We know there were 8 cars that rolled 3 feet home from our dot plot. We know there were 4 cars at the end. Change problems start with an amount and then, at a different time, something happens to change it to make a new end amount.

Let's ask ourselves: Is there a starting amount that increases or decreases to a new amount?

Yes.

The answer is yes, so we write C next to the problem to remind me it's a Change problem.

(Writes.)

Change.

This problem is a Change problem because the problem tells us a starting amount: the number of cars that rolled 3 feet (gesture)**. Then, something happens to change the amount. Remind me again, what happens?**

Mila gave some of the cars to her brother.

Good. Mila gave some of the cars to her brother. If Mila gave some of the cars to her brother, did the starting amount increase or decrease (gesture)**?**

Decrease.

Right. To remind me it's a Change problem, I write 1-C next to the problem. 1 stands for the first step of solving. C stands for Change problem.

Write 1-C.

Now, Mila took all of the cars that rolled 3 feet home. Then, she gave some of the cars to her brother. It's a starting amount that decreases. If it's decreasing, do we add or subtract?

Subtract.

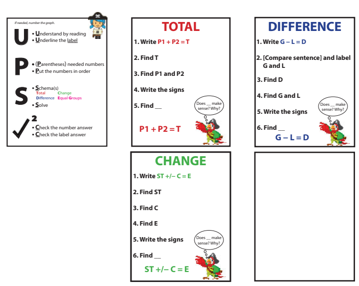
Right. Do we use a plus or a minus sign?

Minus sign.

Good. We use a minus sign. I write the minus sign before C to remind me it's a Change problem that decreases. I put the minus sign to remind me to subtract.

Write – next to C.

Display Large Schema Mat - Version 3 with Change poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Change problem, you're ready to solve it! We decided this is a Change problem, so we use this Change poster to solve it. This is the Change poster (point)**. We'll use it**

to help organize your work. To solve a Change problem, we have six steps. The steps are a lot like the Total and Difference steps.

Step 1 is to write the Change equation. We write ST plus C is the same as E OR ST minus C is the same as E. The sign depends on whether the change is increasing or decreasing. Does this problem have an increase or decrease?

Decrease.

That's right. The change decreases. That's why we wrote a minus sign next to the C. If we wrote a minus sign, we use the Change equation ST minus C is the same as E.

We need to write the Change equation now.

Write ST – C = E.

Step 2: "Find ST." We have to decide the starting amount. Look at the problem. Does it tell us the number of cars that rolled 3 feet home?

(Responds.)

Sometimes, the numbers we need are in our story. Other times, the numbers we need are in our graph. Let's look back at our dot plot. Does it tell us how many cars rolled 3 feet home?

Yes.

Good! How many cars rolled 3 feet home? If you are unsure, look at the number you wrote above 3 feet when you counted the dots.

8.

Nice! The starting amount, or ST, is 8. I check off the 8 and write 8 underneath ST.

Check off 8 in the story and write 8 underneath ST.

Step 3: "Find C." We have to decide the change amount. Sometimes the problem will tell us the change amount. Other times, the change amount is missing. Look at the problem. Do we know how many cars Mila gave to her

brother?

No.

You're right. The change is what's missing. We mark missing information with a blank.

(Writes.)

Step 4 says: "Find E." We have to decide the end amount. Sometimes the problem tells us the end amount. Other times, the end amount is missing. Look at the problem. Does it tell about the end number of cars?

Yes.

What's the end amount of cars?

4.

We know 4 is the end amount because the problem tells us Mila had 4 cars left. Where should I write 4?

Under E.

Check off 4 and write 4 underneath E.

Check off 4 in the story and write 4 underneath E.

Step 5: "Write the signs." Change problems can have a plus sign or a minus sign. In this problem, we said the starting amount decreased. To help us remember this, we wrote ST minus C is the same as E when we wrote the Change equation. This means we use a minus sign and the same as sign to complete the number sentence.

Write the minus sign and the same as sign.

8 stands for the starting amount. Blank stands for the change. 4 stands for the end amount. Does this (point) **look like a number sentence we know how to solve?**

Yes!

When the change is the missing amount, we can just subtract the starting amount minus the end amount to find the change.

Let's find blank! Do you add or subtract?

Subtract.

That's right. You can just subtract 8 minus 4 to find the difference.

(Subtracts.)

Blank is the same as 4.

In word problems, our answer must have a number and a label. We know the number answer is 4. Now we have to figure out what the label for 4 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Cars.

Right! The question is asking about cars, so that's the best label. We write cars for the label! Cars is the word that tells us about our missing information.

Write "cars" next to 4.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our difference reasonable?

Yes!

Nice! Our we know our difference makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is cars.

What word did we underline in our question sentence?

Cars.

Exactly. We underlined cars. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Change problem!

**You earn a treasure coin!**

Point to B.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Donnell cooked some omelettes in the morning, then his family brought over 10 omelettes. Now, Donnell has 13 omelettes. How many omelettes did Donnell cook in the morning?

Problem Type:	*Change, increase*
Relevant Info:	*ST = __; C = 10; E = 13*
Number Sentence:	*__ + 10 = 13*
Answer:	*__ = 3 omelettes*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total and Difference problems. Now we also know about Change problems.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference** (gesture)**?**

In Change problems, the story tells us a starting amount. Something happens in the story to CHANGE the starting amount. If you think it's a Change problem, ask yourself: Does a starting amount increase or decrease to a new amount (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount?

Great job! In Change problems, the starting amount can <u>increase</u>, which means we add (gesture)**, or the starting amount can <u>decrease</u>, which means we subtract** (gesture)**.**

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount (gesture throughout questioning)**?**

Let's read the problem again.

"Donnell cooked some omelettes in the morning, then his family brought over 10 omelettes. Now, Donnell has 13 omelettes. How many omelettes did Donnell cook in the morning?"

This problem talks about omelettes: Donnell cooked some omelettes in the morning, then his family brought over 10 omelettes. The question asks how many omelettes Donnell cooked in the morning. Is this a Total, Difference, or a Change problem?

Wait 10 seconds for student to think.

Change.

You're right! It's a Change problem. This problem is tricky to name. It's a Change problem, but it doesn't ask us for the end amount.

The problem starts with the number of omelettes Donnell cooks in the morning. Then something happens to change that amount. What happens?

Donnell's family brings over 10 omelettes.

Right. This problem is about one thing that changes. Then the problem tells us Donnell has 13 omelettes now. Do we know how many omelettes Donnell cooked in the morning?

No.

Right. The word problem says, "Donnell cooked *some* omelettes in the

morning." Do we know how many *some* is?

No.

You're right! We know Donnell's family brought over 10 omelettes and we know that Donnell has 13 omelettes now. We don't know how many omelettes he started with. We are missing the starting amount.

Change problems start with an amount and then, at a different time, something happens to change it to make a new end amount.

Let's ask ourselves: Is there a starting amount that increases or decreases to a new amount?

Yes.

The answer is yes, write C next to the problem to remind me it's a Change problem.

(Writes.)

This problem is a Change problem because the problem tells us that Donnell cooked some omelettes in the morning (gesture)**. Then, something happens to change the amount. Remind me again, what happens?**

Donnell's family brings over 10 omelettes.

Good. Donnell's family brings over 10 omelettes. If Donnell's family brings over 10 omelettes, did the starting amount increase or decrease (gesture)**?**

Increase.

Right. To remind me it's a Change problem, I write 1-C next to the problem. 1 stands for the first step of solving. C stands for Change problem.

Write 1-C.

Now, Donnell cooked some omelettes in the morning. Then, his family brought over 10 omelettes. It's a starting amount that increases. If it's increasing, do we add or subtract?

Add.

Right. Do we use a plus or a minus sign?

Plus sign.

Good. We use a plus sign. I write the plus sign before C to remind me it's a Change problem that increases. I put the plus sign to remind me to add.

Write + next to C.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is a Change problem, you're ready to solve it! We decided this is a Change problem, so we use this Change poster to solve it. This is the Change poster (point)**. We'll use it to help organize your work. To solve a Change problem, we have six steps. The steps are a lot like the Total and Difference steps.**

Step 1 is to write the Change equation. We write ST plus C is the same as E OR ST minus C is the same as E. The sign depends on whether the change is increasing or decreasing. Does this problem have an increase or decrease?

Increase.

That's right. The change increases. That's why we wrote a plus sign next to the C. If we wrote a plus sign, we use the Change equation ST plus C is the same as E.

We need to write the Change equation now.

Write ST + C = E.

(Writes.)

Step 2: "Find ST." What's the starting amount, or the number of omelettes

Donnell cooked in the morning?

We don't know.

That's right. The question asks, "How many omelettes did Donnell cook in the morning?"

The first sentence (point) **says, "Donnell cooked some omelettes in the morning." Do we know how many *some* is?**

No.

Exactly. We don't know how many *some* is, which is a clue that our starting amount is missing. If the starting amount is missing, what do I need to write under ST?

Blank.

You're right. The starting amount is what's missing. We mark missing information with a blank.

(Writes.)

Step 3: "Find C." We have to decide the change amount. Sometimes the problem will tell us the change amount. Other times, the change amount is missing. Look at the problem. Do we know how many omelettes Donnell's family brought over?

Yes.

How many omelettes did the family bring over?

10.

Right! We know 10 is the change amount because the problem tells us Donnell's family brought over 10 omelettes. Where should I write 10?

Under C.

Check off 10 and write 10 underneath C.

Check off 10 in the story and write 10 underneath C.

(Writes.)

Step 4 says: "Find E." We have to decide the end amount. Sometimes the problem tells us the end amount. Other times, the end amount is missing. Look at the problem. Does it tell about the end number of omelettes?

Yes.

What's the end amount of omelettes?

13.

We know 13 is the end amount because the problem says, "Now, Donnell has 13 omelettes." Where should I write 13?

Under E.

Check off 13 and write 13 underneath E.

Check off 13 in the story and write 13 underneath E.

Step 5: "Write the signs." Change problems can have a plus sign or a minus sign. In this problem, we said the starting amount increased. To help us remember this, we wrote ST plus C is the same as E when we wrote the Change equation. This means we use a plus sign and the same as sign to complete the number sentence.

Write the plus sign and the same as sign.

Blank stands for the starting amount. 10 stands for the change. 13 stands for the end amount. Does this (point) **look like a number sentence we know how to solve?**

Yes!

When the starting amount is the missing amount in a Change increase problem, we can just subtract the end amount minus the change amount to find the starting amount.

Let's find blank! Do you add or subtract?

Subtract.

That's right. You can just subtract 13 minus 10 to find the difference.

(Subtracts.)

Blank is the same as 3.

In word problems, our answer must have a number and a label. We know the number answer is 3. Now we have to figure out what the label for 3 should be. Think about what the problem is about. Look at what we underlined. What did we underline?

Omelettes.

Right! The question is asking about omelettes, so that's the best label. We write omelettes for the label! Omelettes is the word that tells us about our missing information.

Write "omelettes" next to 3.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our difference reasonable?

Yes!

Nice! Our we know our difference makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is omelettes.

What word did we underline in our question sentence?

Omelettes.

Exactly. We underlined omelettes. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving that Change problem!

Point to C.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

> *The surfers rode 39 waves before stopping for lunch. After lunch, they rode some more waves. By the end of the day, the surfers had ridden 56 waves. How many waves did they ride after lunch?*

Problem Type: *Change, increase*
Relevant Info: *ST = 39; C = ___; E = 56*
Number Sentence: *39 + ___ = 56*
Answer: *___ = 17 waves*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Change increase problem with a missing change.
Use the What Do You Ask Yourself? poster and gesture and question with student.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

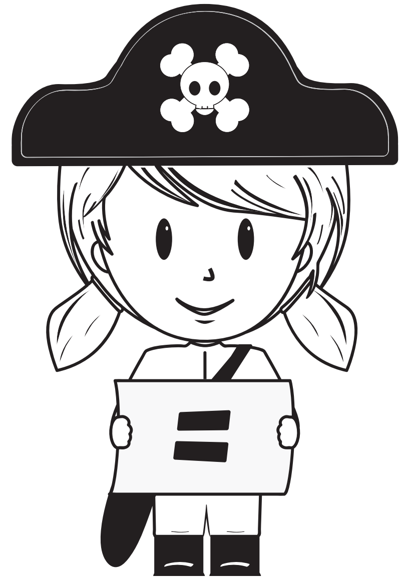
Go ahead and color ___ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 17

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Change with start or change missing
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Large Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 17
Buccaneer Problems: Lesson 17
Jolly Roger Review: Lesson 17
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been talking about addition and subtraction equations with parentheses. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 14 minus 7 closed parentheses minus 6 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Subtract.

How do you know?

There are two minus signs.

Nice! To solve this problem, we need to subtract. What do we need to subtract first?

(Responds.)

Exactly! We need to subtract 14 minus 7. Why do we need to subtract 14 minus 7 first?

Because there are parentheses around the 14 minus 7. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 14 minus 7 first. Let's go ahead and subtract. What's 14 minus 7? Use the Counting Up poster if needed.

7.

Yes! 14 minus 7 is the same as 7. Let's write 7 underneath the 14 minus 7.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract 7 minus 6. What is 7 minus 6? Use the Counting Up poster if needed.

1.

Nice! So open parentheses 14 minus 7 closed parentheses minus 6 is *the same as* what?

1.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

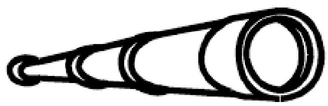
What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!



3: Buccaneer Problems

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

Now say the Difference equation.

G – L = D.

Good. Say it again.

G – L = D.

Recently, we started talking about Change problems. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. You have to decide which Change equation to use. What are the two Change equations?**

ST + C = E and ST – C = E.

The past few weeks, we've learned about Total and Difference problems. When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total (gesture)**. Sometimes the missing information is the total. Other times, the missing**

information is one of the parts.

How do you know if a problem is a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference (gesture)**.**

In Change problems, we have a starting amount. Then, something happens to increase or decrease the amount we started with (gesture)**. What does the word *increase* mean?**

To make bigger.

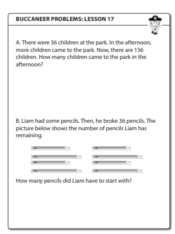
Yes, the word *increase* means to make bigger or more. What does the word *decrease* mean?

To make smaller.

Great. The word *decrease* means to make smaller or less. So, Change problems tell us a starting amount. At a different time, something happens to make the amount you started with bigger or smaller.

Look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 17

A. There were 56 children at the park. In the afternoon, more children came to the park. Now, there are 156 children. How many children came to the park in the afternoon?

B. Liam had some pencils. Then, he broke 36 pencils. The picture below shows the number of pencils Liam has remaining.

How many pencils did Liam have to start with?

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem A:

There were 56 children at the park. In the afternoon, more children came to the park. Now, there are 156 children. How many children came to the park in the afternoon?

Problem Type:	*Change, increase*
Relevant Information:	*ST = 56; C = __; E = 156*
Number Sentence:	*56 + __ = 156*
Answer:	*__ = 100 children*

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Change increase problem with a missing change.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

You're right! We don't have a graph, but we have a picture of pencils. Let's go ahead and count the pencils.

(Numbers.)

Solution to Problem B:

Liam had some pencils. Then, he broke 36 pencils. The picture below shows the number of pencils Liam has remaining. How many pencils did Liam have to start with?

Problem Type:	*Change, decrease*
Relevant Info:	*ST = __; C = 36; E = 8*
Number Sentence:	*__ – 36 = 8*
Answer:	*__ = 44 pencils*

Follow steps on the UPS Check^2 poster.

Follow steps for solving a Change decrease problem with a missing starting amount. Review with student that when we have a Change decrease problem with a missing starting amount, we add to find the missing information. Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Melissa brought money to spend at the yard sale. She bought a book for $4. The cashier gave her $11 in change. How much money did Melissa bring to the yard sale?

Problem Type:	*Change, decrease*
Relevant Info:	*ST = __; C = 4; E = 11*
Number Sentence:	*__ – 4 = 11*
Answer:	*__ = $15*

Follow steps on the UPS Check^2 poster. Follow steps for solving a Change decrease problem with a missing starting amount. Review with student that when we have a Change decrease problem with a missing starting amount, we add to find the missing information. Use the What Do You Ask Yourself? poster and gesture and question with student.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

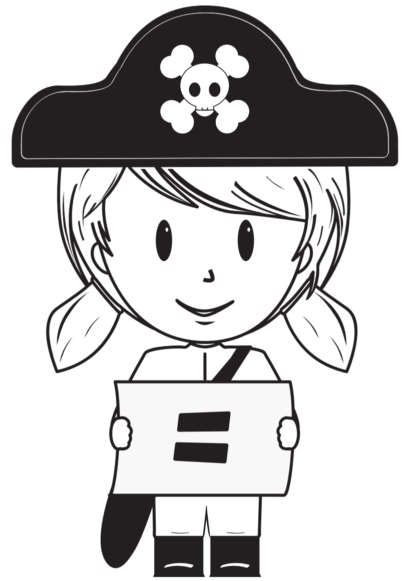
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 18

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Change with three and four changes
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Large Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 18
Buccaneer Problems: Lesson 18
Jolly Roger Review: Lesson 18
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let’s get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been talking about addition and subtraction equations with parentheses. Today, we are going to solve equations where we have to add *and* subtract. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 12 plus 8 closed parentheses minus 1 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Both.

How do you know?

There is a plus sign and a minus sign.

Nice! To solve this problem, we need to add then subtract. What do we need to do first?

(Responds.)

Exactly! We need to add 12 plus 8. Why do we need to add 12 plus 8 first?

Because there are parentheses around the 12 plus 8. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 12 plus 8 first. Let's go ahead and add. What's 12 plus 8? Use the Counting Up poster if needed.

20.

Yes! 12 plus 8 is the same as 20. Let's write 20 underneath the 12 plus 8.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract 20 minus 1. What is 20 minus 1? Use the Counting Up poster if needed.

19.

Nice! So open parentheses 12 plus 8 closed parentheses minus 1 is *the same as* what?

19.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Student.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Student.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

Let's review. What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

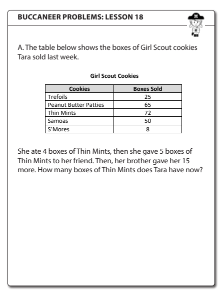
ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

Let's solve some word problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 18

A. The table below shows the boxes of Girl Scout cookies Tara sold last week.

Girl Scout Cookies

Cookies	Boxes Sold
Trefoils	25
Peanut Butter Patties	65
Thin Mints	72
Samoas	50
S'Mores	8

She ate 4 boxes of Thin Mints, then she gave 5 boxes of Thin Mints to her friend. Then, her brother gave her 15 more. How many boxes of Thin Mints does Tara have now?

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

Yes.

You're right! There's a table, but it already is numbered, so we can move on to our UPS Check^2 steps.

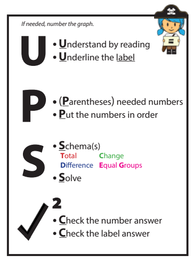
<u>*Solution to Problem A:*</u>

The table below shows the boxes of Girl Scout cookies Tara sold last week. She ate 4 boxes of Thin Mints, then she gave 5 boxes of Thin Mints to her friend. Then, her brother gave her 15 more. How many boxes of Thin Mints does Tara have now?

Problem Type: *Change, decrease, decrease, increase (triple Change)*
Relevant Information: *ST = 72; C = – 4 ; C = – 5; C = + 15; E = __*
Irrelevant Information: ~~*Trefoils, Peanut Butter Patties, Samoas, S'Mores*~~
Number Sentence: *72 – 4 – 5 + 15 = __*

Answer: *__ = 78 boxes of Thin Mints*

Point to UPS Check² poster on the Large Schema Mat - Version 3.



To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. When you see a word problem, you understand by reading the problem. If you have trouble reading a problem, I'll help you.

Let's read the problem together. "The table below shows the boxes of Girl Scout cookies Tara sold last week. She ate 4 boxes of Thin Mints, then she gave 2 boxes of Thin Mints to her friend. Then, her brother gave her 15 more. How many boxes of Thin Mints does Tara have now?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

We need to find out the label, or what the problem is mostly about. What is our problem mostly about?

(Responds.)

Our question is asking us to find the boxes of Thin Mints, so let's underline boxes of Thin Mints. Let's make sure to underline our complete label.

Underline boxes of Thin Mints in the question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check our problem. Remember, we have numbers in our table *and* in our story, so let's make sure we check the numbers in our table *and* in our story.

We care about numbers that are about our label. Remind me, what's our label?

Boxes of Thin Mints.

Good! Let's start with our table. What's the first number you see?

25.

Is 25 talking about Thin Mints?

(Responds.)

You're right! 25 is talking about Trefoils. We don't care about the boxes of Trefoils, so let's cross that out.

Cross out 25 Trefoils in the table.

(Writes.)

What's the next number you see?

65.

Is 65 talking about Thin Mints?

(Responds.)

You're right! 65 is talking about Peanut Butter Patties. We don't care about the boxes of Peanut Butter Patties, so let's cross that out.

Cross out 65 Peanut Butter Patties in the table.

(Writes.)

What's the next number you see?

72.

Is 72 talking about Thin Mints?

(Responds.)

You're right! 72 is talking about Thin Mints, so we need that number. Let's put parentheses around 72 Thin Mints.

(Writes.)

What's the next number you see?

50.

Is 50 talking about Thin Mints?

(Responds.)

You're right! 50 is talking about Samoas. We don't care about the boxes of Samoas, so let's cross that out.

Cross out 50 Samoas in the table.

(Writes.)

What's the last number you see in the table?

8.

Is 8 talking about Thin Mints?

(Responds.)

You're right! 8 is talking about S'Mores. We don't care about the boxes of S'Mores, so let's cross that out.

Cross out 8 S'Mores in the table.

(Writes.)

Now that we have checked the numbers in our table, we need to check the numbers in our story.

What's our first number in our story?

4.

4 is about boxes of Thin Mints, so 4 is relevant. Let's put parentheses around 4

boxes of Thin Mints.

(Writes.)

What is our next number?

5.

Our next number is 5. 5 is about boxes of Thin Mints, so 5 is relevant. Let's put parentheses around 5 boxes of Thin Mints.

(Writes.)

What's our last number?

15.

It says 15 more, and 15 is referring to boxes of Thin Mints, so 15 is relevant. Let's put parentheses around 15 boxes of Thin Mints.

(Writes.)

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Right now, we are working on problems that have one step, so we only need the number 1. Later in our program, we will work multi-step problems where we put a 2 (and even a 3!) above the numbers.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

Right now, we only are working single-step problems, so let's put a 1 above any needed numbers. Remember, in the last step, we put parentheses around our needed numbers, so we only need to work with the numbers in parentheses. Remind me, what are needed numbers?

Numbers that are about our label.

Exactly! Needed numbers are numbers that are about our label. The needed numbers are in parentheses. What is the first number we have in parentheses?

72 boxes of Thin Mints.

Great job! 72 boxes of Thin Mints is in parentheses in our table, so let's write a 1 above 72 boxes of Thin Mints to show that 72 boxes of Thin Mints is involved in the first step of solving our problem.

(Writes.)

What is the second number we have in parentheses?

4 boxes of Thin Mints.

Great job! 4 boxes of Thin Mints is in parentheses in our story, so let's write a 1 above 4 boxes of Thin Mints to show that 4 boxes of Thin Mints is involved in the first step of solving our problem.

(Writes.)

What is the third number we have in parentheses?

5 boxes of Thin Mints.

Great job! 5 boxes of Thin Mints is in parentheses, so let's write a 1 above 5 boxes of Thin Mints to show that 5 boxes of Thin Mints is involved in the first step of solving our problem.

(Writes.)

What is the last number we have in parentheses?

15 more (boxes of Thin Mints).

Great job! 15 more is in parentheses, so let's write a 1 above 15 more (boxes of Thin Mints) to show that 15 more is involved in the first step of solving our problem.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Great job! Now we are ready to move on to the next step.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total and Difference problems. Now we also know about Change problems. Let's use our What Do You Ask Yourself? poster to help us identify the schema.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total (gesture)**? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference** (gesture)**? If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount** (gesture)**?**

Let's decide. Is this problem about parts and a total? Or is it about two

amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount (gesture throughout questioning)**?**

Let's read the problem again.

"The table below shows the boxes of Girl Scout cookies Tara sold last week. She ate 4 boxes of Thin Mints, then she gave 5 boxes of Thin Mints to her friend. Then, her brother gave her 15 more. How many boxes of Thin Mints does Tara have now?"

This question asks, "How many boxes of Thin Mints does Tara have now?" Let's ask ourselves: Is there a starting amount that increases or decreases to a new amount?

Yes.

Right. To remind me it's a Change problem, I write 1-C next to the problem. 1 stands for the first step of solving. C stands for Change problem.

Write 1-C.

Now let's figure out if it's an increase or decrease. What happens in the story to change the amount of Thin Mints Tara had?

She ate 4.

Yes. She ate 4. Look carefully though. Another thing happened in this story to change the starting amount. What is it?

She gave 5 boxes of Thin Mints to her friend.

Yes! But look again. Something else happened! Tara ate 4 boxes of Thin Mints, then she gave 5 boxes to her friend. Then, something else happened. What happened?

Her brother gave her 15 more boxes of Thin Mints.

That's right. In this problem, there are three changes! We have to figure out if these changes increased or decreased the starting amount. What happened in the story first?

Tara ate 4 boxes of Thin Mints.

If Tara ate 4 boxes of Thin Mints, is that an increase or decrease?

Decrease.

Good. I put a minus sign in front of the C. We're not done, though. What happened next?

Tara gave 5 boxes of Thin Mints to her friend.

If Tara gave away boxes to her friend, is that an increase or decrease?

Decrease.

Good. That's another change. I write another minus C next to the problem. We're not done, though. What happened next?

Tara's brother gave her 15 more boxes of Thin Mints.

If Tara's brother gave her 15 more boxes of Thin Mints, is that an increase or decrease?

Increase.

Good. I put a plus sign in front of the C. This reminds me there are three changes. The first two changes decreased Tara's boxes of Thin Mints and the third change increased Tara's boxes of Thin Mints.

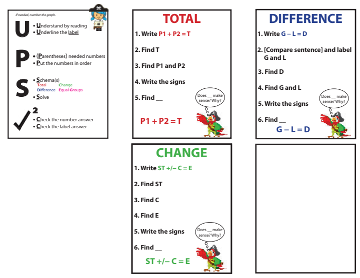
Write minus C minus C plus C on your paper. This reminds me it's a Change problem with three changes.

(Writes.)

Let's review. This is a Change problem because a starting amount, Tara's boxes of Thin Mints, changes to a new end amount. So far, we've solved problems where only one thing happens to change the starting amount. In this problem, three things happen to change the starting amount. When we have more than one change, we can still use the Change poster to solve the problem.

Write – C – C + C.

Display Large Schema Mat - Version 3 with Change poster.



Here are the six steps for a Change problem. Step 1 says to write the Change equation.

We write ST plus C is the same as E or ST minus C is the same as E. Our Change equation sets up a problem when there's only one change. In this problem, though, there are three changes. Our Change equation should look like this:

Write ST – C – C + C = E.

We put three changes in the equation so we get the right end amount.

Step 2: "Find ST." What's Tara's starting amount of boxes of Thin Mints? Remember to use the table to help you out.

72.

72 is the starting amount of boxes of Thin Mints. So, let's check off 72 and write 72 under ST.

Check off 72 and write 72 underneath ST.

Step 3: "Find C." Remember, this problem talks about three changes. So, let's think about the first change. What happened first?

Tara ate 4 boxes of Thin Mints.

Exactly! Tara ate 4 boxes of Thin Mints. So, what's the first change?

4.

Very good! First, Tara ate 4 boxes of Thin Mints. Check off 4 in the story and write 4 under the first C.

Check off 4 and write 4 underneath the first C.

There are two more changes. So we can't move to Step 4 yet. What's the next change? What happened next in the story?

Tara gave 5 boxes of Thin Mints to her friend.

Yes! Tara gave 5 boxes of Thin Mints to her friend. The second change is 5. Check off 5 in the story and write 5 under the second C.

Check off 5 and write 5 underneath the second C.

Now we have one final change. What happened last in the story?

Tara's brother gave her 15 boxes of Thin Mints.

Yes! Tara's brother gave her 15 boxes of Thin Mints. The third change is 15. Check off 15 in the story and write 15 under the third C.

Check off 15 and write 15 underneath the third C.

Now we can move to Step 4. "Find E." What's the end amount of boxes of Thin Mints?

We don't know.

That's right. The question asks, "How many boxes of Thin Mints does Tara have now?" The end amount is what's missing. We mark missing information with a blank.

(Writes.)

Sometimes Change problems ask us to put two or three (or even four!) changes in the equation. These are still Change problems because there's still a starting amount that changes. It just changes more than once.

When a problem has extra numbers, it's easy to think there's irrelevant information. Don't be fooled. To decide if information is important or

irrelevant, you must think carefully about the problem. Figure out if the starting amount changes just one time or more than one time. If all the numbers are about the label (point), **then there's more than one change. All of the numbers are important.**

Let's go to Step 5. What's Step 5?

Write the signs.

Good. What math signs do we use to complete our number sentence?

–, –, +, and =.

(Writes.)

72 stands for the starting amount. 4 stands for the first change. 5 stands for the second change. 15 stands for the third change. Blank stands for end. We had to be sure that we put the changes in same order we see them in the problem. Tara ate 4 boxes of Thin Mints first, so that's the first change. Next, Tara gave 5 boxes of Thin Mints to her friend, so that's the second change. Third, Tara's brother gave her 15 more boxes of Thin Mints, so that's the third change.

Does this look like a number sentence we know how to solve?

Yes/No.

Don't let the number sentence trick you. We solved some problems like this when we solved Total problems with three and four parts. Let's solve this problem from left to right.

Let's read the number sentence together.

Read number sentence aloud with student.

Let's find blank!

Let's look at the first sign. Is this a plus or a minus sign?

Minus sign. We subtract.

Right. The minus sign tells us to subtract. I subtract 72 minus 4. What's 72 minus 4?

68.

Good. I write 68 underneath 72 minus 4 to remind me it's 68. I'm not finished though. What do we do next to find blank?

Subtract 68 minus 5.

Good. I subtract 68 minus 5. What's 68 minus 5?

63.

Good. I write 63 underneath 68 minus 5 to remind me it's 63. I'm not finished though. I have one more step. What do we do next to find blank?

Add 63 plus 15.

What is 63 plus 15? Use Counting Up if needed.

78.

Right! You said 72 minus 4 equals 68. Then, 68 minus 5 is 63. Then, 63 plus 15 is 78. Let's write 78 as our sum.

(Writes.)

In word problems, our answer must have a number and a label. We know the number answer is 78. Now we have to figure out what the label for 78 should be. Think about what the problem is about. Look at what we underlined. What did we underline in the question sentence?

Boxes of Thin Mints.

Right! The question is asking about boxes of Thin Mints, so that's the best label. We write boxes of Thin Mints for the label! Boxes of Thin Mints tells us about our missing information.

Write "boxes of Thin Mints" next to 78.

What is our number answer?

78.

Right. And what is our label answer?

Boxes of Thin Mints.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "How many boxes of Thin Mints does Tara have now?" Did we answer the question?

Yes.

Yes. This is a triple Change problem. Our amount decreased, then decreased a second time, then increased.

Review story and three changes with student while gesturing to review why the answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is boxes of Thin Mints.

What did we underline in our question sentence?

Boxes of Thin Mints.

Exactly. We underlined boxes of Thin Mints. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Let's review. This Change problem tells us about three changes. Three things happened to change the starting amount. We have to be careful when we see extra numbers in a problem. Sometimes the extra numbers are irrelevant information. But other times, the extra numbers are important information, like in the problem we just solved. So be careful. You have to think hard to decide whether a number is irrelevant or important.

Great job solving that triple Change problem! Let's try another one!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

> *Lindsey ran 2 miles alone. Then, she ran another 10 miles with her sister. Next, she ran 3 miles with her dad. She also ran 5 miles with her mom. How far did Lindsey run?*
> *Problem Type:* *Change, increase, increase, increase (triple Change)*
> *Relevant Info:* *ST = 2; C = + 10; C = + 3; C = + 5; E = __*
> *Number Sentence:* *2 + 10 + 3 + 5 = __*

Answer: __ = 20 miles

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Change problem with 3 changes.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, we first have to check if there is a graph or a table. Is there a graph or a table?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Kasey has a $10 bill to spend at the carnival. She buys one game for $5, two bags of popcorn for $1 each, and a stuffed bear for $2. How much money does Kasey have left?

Problem Type: Change, decrease, decrease, decrease, decrease (quadruple Change)
Relevant Info: ST = 10; C = – 5; C = – 1; C = – 1; C = – 2; E = __
Number Sentence: 10 – 5 – 1 – 1 – 2 = __
Answer: __ = $1

Follow steps on the UPS Check^2 poster.
Follow steps for solving a Change problem with 3 changes to solve this problem with 4 changes.
Use the What Do You Ask Yourself? poster and gesture and question with student.
Explain to student that each bag of popcorn is considered one change.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

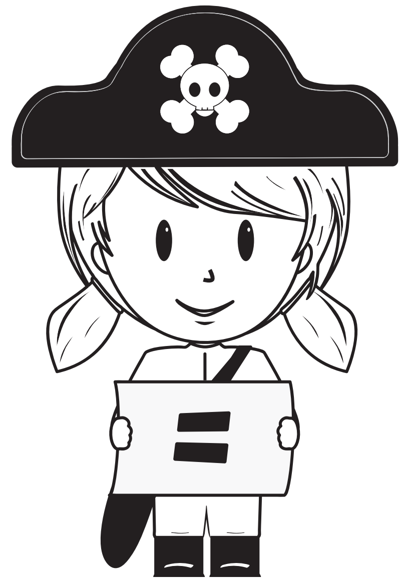
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 19

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Total and Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 19
Buccaneer Problems: Lesson 19
Jolly Roger Review: Lesson 19
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been solving equations with parentheses. Today, we are going to continue to solve equations where we have to add *and* subtract. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, open parentheses 8 minus 1 closed parentheses plus 6 is *the same as* (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Do we need to add or subtract?

Both.

How do you know?

There is a plus sign and a minus sign.

Nice! To solve this problem, we need to subtract then add. What do we need to do first?

(Responds.)

Exactly! We need to subtract 8 minus 1. Why do we need to subtract 8 minus 1 first?

Because there are parentheses around the 8 minus 1. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 8 minus 1 first. Let's go ahead and subtract. What's 8 minus 1? Use the Counting Up poster if needed.

7.

Yes! 8 minus 1 is the same as 7. Let's write 7 underneath the 8 minus 1.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add 7 plus 6. What is 7 plus 6? Use the Counting Up poster if needed.

13.

Nice! So open parentheses 8 minus 1 closed parentheses plus 6 is *the same as* what?

13.

Nice work! Go ahead and write the sum.

(Writes.)

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Student.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Student.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

Recently, we learned about problems that are Total *and* Difference problems. We will continue solving multi-step Total and Difference problems today. Before we get started, let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph.

Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

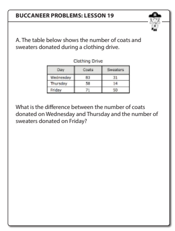
A number and a label.

Remind me, what is a multi-step Total and Difference problem?

(Responds.)

Exactly! A multi-step Total and Difference problem includes the Total and Difference schemas. Today we are going to continue talking about word problems that are Total *and* Difference problems!

Point to A.


BUCCANEER PROBLEMS: LESSON 19

A. The table below shows the number of coats and sweaters donated during a clothing drive.

Clothing Drive

Day	Coats	Sweaters
Wednesday	83	31
Thursday	58	14
Friday	71	50

What is the difference between the number of coats donated on Wednesday and Thursday and the number of sweaters donated on Friday?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We see a table, but it's already numbered so we are ready to follow our UPS Check^2 steps.

<u>*Solution to Problem A:*</u>

> *The table below shows the number of coats and sweaters donated during a clothing drive. What is the difference between the number of coats donated on Wednesday and Thursday and the number of sweaters donated on Friday?*
> *Problem Type:* *Total and Difference*

Equation: *(P1 + P2) – L = __*
Relevant Information: *P1 = 83; P2 = 58; L = 50*
Irrelevant Information: *~~coats donated on Friday, sweaters donated on Wednesday, sweaters donated on Thursday~~*
Number Sentence: *(83 + 58) – 50 = __*
Answer: *__ = 91 (more) coats*

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's greater.
Refer to dialogue from Lesson Guides 11 and 12 as needed.
Review with student that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2) – L = __.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We see a table, but it's already numbered so we are ready to follow our UPS Check^2 steps.

Solution to Problem B:

The prices for items at an ice cream shop are shown in the table. Julie buys two large sundaes and a large ice cream cone. How much change will she receive from a $20 bill?
Problem Type: *Total and Difference*
Equation: *G – (P1 + P2 + P3) = __*
Relevant Information: *G = 20; P1 = 5; P2 = 5; P3 = 2.25*
Irrelevant Information: *~~small size ice cream cone, small size sundae, small and large size frozen yogurt, small and large size milkshake~~*
Number Sentence: *20 – (5 + 5 + 2.25) = __*
Answer: *__ = $7.75*

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's less.
Refer to dialogue from Lesson Guides 11 and 12 as needed.

Review with student that there are 3 parts, so we need to add a P3.
Review with student that the combined amount is the amount that's less, so we need to use the equation $G - (P1 + P2 + P3) = \_\_$.
**Note: student may solve this problem as a triple Change problem with 3 decreases if desired.*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a graph or a table, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Mr. Gomez sold 30 rings during Week 1 and 50 rings during Week 4. He sold 40 rings during Week 5. How many more rings did Mr. Gomez sell in Weeks 1 and 4 than in Week 5?

Problem Type:	*Total and Difference*
Equation:	$(P1 + P2) - L = \_\_$
Relevant Information:	$P1 = 30; P2 = 50; L = 40$
Number Sentence:	$(30 + 50) - 40 = \_\_$
Answer:	$\_\_ = 40$ *(more) rings*

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's greater.
Refer to dialogue from Lesson Guides 11 and 12 as needed.
Review with student that the combined amount is the amount that's greater, so we need to use the equation $(P1 + P2) - L = \_\_$.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

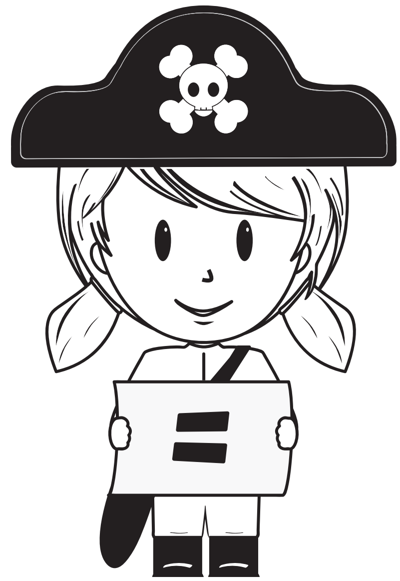
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 20

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 1
Large Schema Mat - Version 1

Student Materials

Equation Quest: Lesson 20
Buccaneer Problems: Lesson 20
Jolly Roger Review: Lesson 20
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

We have been solving equations with parentheses. Today, we are going to continue to solve equations where we have to add *and* subtract. Remind me, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Today, we are going to solve these problems (point)**. When we solve the problems, we need to think hard about what we need to do first and what we need to do second. Let's get started. Let's read A** (point)**.**

Point to A.

This number sentence says, blank is *the same as* (point to =) **open parentheses 13 plus 6 closed parentheses minus 4. Go ahead and read the number sentence.**

(Reads.)

Even though the blank is on the left side (point) **of the equal sign, we can still solve the equation the same way as before. All we have to do is balance both of the sides. What do we need to do?**

Balance both of the sides.

Nice! Do we need to add or subtract?

Both.

How do you know?

There is a plus sign and a minus sign.

Nice! To solve this problem, we need to add then subtract. What do we need to do first?

(Responds.)

Exactly! We need to add 13 plus 6. Why do we need to add 13 plus 6 first?

Because there are parentheses around the 13 plus 6. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 13 plus 6 first. Let's go ahead and add. What's 13 plus 6? Use the Counting Up poster if needed.

19.

Yes! 13 plus 6 is the same as 19. Let's write 19 underneath the 13 plus 6.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract 19 minus 4. What is 19 minus 4? Use the Counting Up poster if needed.

15.

Nice! Blank is *the same as* open parentheses 13 plus 6 closed parentheses minus 4. What is blank?

15.

Nice work! Go ahead and write the difference.

(Writes.)

Let's read our completed number sentence.

(Reads.)

Great! 15 is the same *as* open parentheses 13 plus 6 closed parentheses minus 4.

Let's try another one.

Solve B-D using the same dialogue as A.
Provide feedback as necessary.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Student.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Student.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you

see a word problem anywhere!

Recently, we learned about problems that are Total *and* Difference problems. We will continue solving multi-step Total and Difference problems today. Before we get started, let's review.

What's a Total problem?

When parts are put together into a total.

In a Total problem, parts are put together to make a total (gesture)**. All Total problems have the same Total equation. What's the Total equation?**

P1 + P2 = T.

That's right. The Total equation is part 1 plus part 2 is the same as the total.

Now let's review Difference problems. In Difference problems, we compare two amounts to find the difference (gesture)**. What does it mean to compare two amounts?**

(Student.)

Good. One amount is greater. The other amount is less.

The Difference equation is G minus L is the same as D (point)**. The amount that's greater minus the amount that's less is the same as the difference. What's the Difference equation?**

G – L = D.

Let's say the equation together, one more time.

G – L = D.

Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

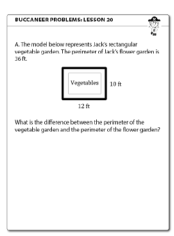
A number and a label.

Remind me, what is a multi-step Total and Difference problem?

(Responds.)

Exactly! A multi-step Total and Difference problem includes the Total and Difference schemas. Today we are going to continue talking about word problems that are Total *and* Difference problems!

Point to A.



BUCCANEER PROBLEMS: LESSON 20

A. The model below represents Jack's rectangular vegetable garden. The perimeter of Jack's flower garden is 36 ft.

What is the difference between the perimeter of the vegetable garden and the perimeter of the flower garden?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. We see a figure and two of the sides already are numbered. Let's go ahead and number the remaining two sides.

What kind of shape is the figure?

A rectangle.

Nice! And what do we know about a rectangle?

Opposite sides are the same length.

Exactly! In a rectangle, opposite sides are the same length. So, if this side is 10 ft (point to right side)**, what is this side** (point to left side)**?**

10 feet.

Great! And if this side is 12 ft (point to bottom)**, what is this side** (point to top)**?**

12 feet.

Great! Go ahead and number those two sides.

(Numbers.)

Now that we have numbered our graph, we are ready to follow our UPS Check[2] steps.

<u>*Solution to Problem A:*</u>

> *The model below represents Jack's rectangular vegetable garden. The perimeter of Jack's flower garden is 36 ft. What is the difference between the perimeter of the vegetable garden and the perimeter of the flower garden?*
>
> | | |
> |---|---|
> | *Problem Type:* | *Total and Difference* |
> | *Equation:* | *(P1 + P2 + P3 + P4) – L = __* |
> | *Relevant Information:* | *P1 = 12; P2 = 10; P3 = 12; P4 = 10; L = 36* |
> | *Number Sentence:* | *(12 + 10 + 12 + 10) – 36 = __* |
> | *Answer:* | *__ = 8 (more) ft* |

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's greater.
Refer to dialogue from Lesson Guides 11 and 12 as needed.
Review with student that we find the perimeter of the vegetable garden by adding all 4 sides.
Review with student that there are 4 parts, so we need to add a P3 and P4.
Review with student that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2 + P3 + P4) – L = __.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a graph or a table, what would you do?

Number it.

Solution to Problem B:

At the carnival, Ryan spent $9 on games and $7 on rides. If Ryan brought a $20 bill to the carnival, how much money did he have left?

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2) = __*
Relevant Information:	*G = 20; P1 = 9; P2 = 7*
Number Sentence:	*20 – (9 + 7) = __*
Answer:	*__ = $4*

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's less.
Refer to dialogue from Lesson Guides 11 and 12 as needed.
Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2) = __.
**Note: student may solve this problem as a double Change problem with 2 decreases if desired.*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a graph or a table, what would you do?

Number it.

Solution to Problem C:

Sally sold bracelets for 2 days. On the first day, Sally made $64. On the second day, she made $98. How much money did Sally make selling bracelets?

Problem Type: *Total*
Equation: *P1 + P2 = ___*
Relevant Information: *P1 = 64; P2 = 98*
Irrelevant Information: ~~*Sally sold bracelets for 2 days.*~~
Number Sentence: *64 + 98 = ___*
Answer: *___ = $162*

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

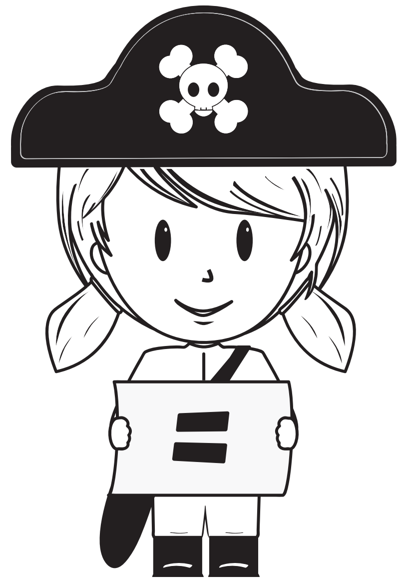
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 21



ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
    Equal Groups with missing product
4. Shipshape Sorting
5. Jolly Roger Review

Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 21
Buccaneer Problems: Lesson 21
Jolly Roger Review: Lesson 21
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. But today the problems look a little different.

What is different about today's problems (point)**?**

The problems are multiplication problems.

That's right! These problems are multiplication problems. We call problems with groups multiplied Equal Groups problems. We will learn all about Equal Groups problems today. We can still solve these problems using the same steps we use to solve addition and subtraction equations.

Point to A.

Let's read the problem. 6 times 3 is the same as blank. Let's say that together.

6 times 3 is the same as blank.

What do we need to do to balance both of the sides?

Multiply 6 times 3.

Exactly. We can multiply the two numbers to make the two sides the same. What should we multiply?

6 and 3.

Yes! Let's use cubes to solve this problem. If we have 6 times 3, we need to make 6 groups of 3 with the cubes. Go ahead and make the groups with the cubes.

(Makes 6 groups of 3.)

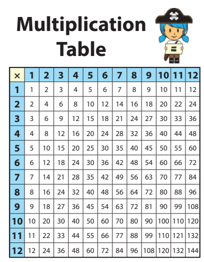
Now that we have made 6 groups of 3, let's count the cubes. How many cubes do we have?

(Counts.)

18.

Exactly! We also can use our Multiplication Table poster to check our work.

Display Multiplication Table poster.


Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we put one finger on the 6 in the left blue row (point) **and another finger on the 3 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

18.

Nice! So what is our product, or answer?

18.

Exactly! 6 times 3 is 18. What is blank the same as?

18.

(Writes.)

Let's read the number sentence together.

6 times 3 is the same as 18.

Let's try another one.

Point to B.

Let's read the problem. Blank is the same as 4 times 5. Let's say that together.

Blank is the same as 4 times 5.

What do we need to do to balance both of the sides?

Multiply 4 times 5.

Exactly. We can multiply the two factors to make the two sides the same. What should we multiply?

4 and 5.

Yes! Let's use cubes to solve this problem. If we have 4 times 5, we need to make 4 groups of 5 with the cubes. Go ahead and make the groups with the cubes.

(Makes 4 groups of 5.)

Now that we have made 4 groups of 5, let's count the cubes. How many cubes do we have?

(Counts.)

20.

To check our work, we put one finger on the 4 in the left blue row (point) **and another finger on the 5 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

20.

Nice! So what is our product, or answer?

20.

Exactly! We also could have checked our product by counting by fives 4 times. Let's do that.

(Counts.)

So, 4 times 5 is the same as what?

20.

(Writes.)

Let's read the number sentence together.

20 is the same as 4 times 5.

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

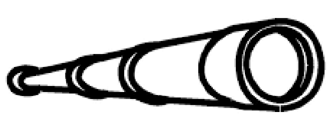
What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!



3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, and Change problems. We also have learned about multi-step Total and Difference

problems. Today we are going to learn about a new problem type.

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We

have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

Today, we'll learn about Equal Groups problems. Say that with me.

Equal Groups.

In Equal Groups problems, we make groups with an equal number in each group to find an answer, which we call the product.

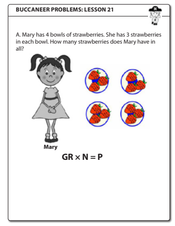
What does it mean to make an equal group?

(Responds.)

Exactly. When we have equal groups, we have groups with an equal number in each group.

Let me show you what I mean. Look at this problem.

Point to A.



"Mary has 4 bowls of strawberries. She has 3 strawberries in each bowl. How many strawberries does Mary have in all?"

This is an Equal Groups story because the story tells us that Mary has 4 groups of strawberries, and she has an equal number of strawberries in each group.

How many groups of strawberries does Mary have?

4.

Exactly. Mary has 4 groups of strawberries. Mary has an equal number of strawberries in each of the 4 groups.

Remind me what equal number means?

The same.

Exactly. Mary has the same number or an equal amount of strawberries in each of her 4 groups.

How many strawberries does Mary have in each group?

3.

Good! This is an Equal Groups story because Mary has 3 strawberries in each of her 4 groups.

Circle 4 and 3 in the story.

Here's the number sentence that goes with this story: 4 times 3 is the same as blank.

Write $4 \times 3 =$ ___.

This number sentence stands for what's happening in this Equal Groups story. Mary has 4 groups, which are the 4 bowls of strawberries. How many groups does she have?

4.

Right. She has 4 groups, or bowls of strawberries.

She has an equal number of strawberries in each group. How many strawberries does she have in each group?

3.

Right. Mary has 3 strawberries in each of her 4 groups or bowls. That's like the number sentence: 4 times 3 is the same as blank. Let me show you how this works.

This is a picture of Mary and her strawberries (point)**. Mary's name is written here** (point)**. Mary's strawberries are shown here** (point)**. Look at the bowls of strawberries outlined by the circles. Each bowl stands for one group. How many groups of strawberries or circles do you count?**

Count the 4 groups of strawberries with student, using the picture as a guide.

4.

That's right. We know Mary has 4 groups of strawberries because we see the 4 bowls, which stand for 4 groups.

In Equal Groups problems, the story tells us the number of groups. The story also tells us the number *in* each group. In an Equal Groups story, there is an equal number, or the same number in each group. In this problem, Mary has the same number of strawberries in each of her groups, or bowls. How many strawberries does Mary have in each group?

Count the 3 strawberries in each group with student, using the picture as a guide. Review that there are the same number of strawberries in each of the 4 groups.

3.

Right. There are 3 strawberries in each of Mary's 4 groups, or bowls.

Let's review. Mary has 4 groups of strawberries. She has 3 strawberries in each group. To find out how many strawberries Mary has in all, we can count the number of strawberries in the 4 groups (Demonstrate the Equal Groups gesture. With your one hand out with your palm flat, use your other hand to pretend to place an object in the palm of your hand. Show that for one group or bowl, there are 3 strawberries. Repeat the gesture for the number of groups you want to show. For this problem, repeat the gesture 4 times to show 4 groups with 3 in each group)**.**

Count the number of strawberries until you reach 12 strawberries, using the picture as a guide.

How many strawberries does Mary have in all?

12.

Exactly! Mary has 12 strawberries in all!

For Equal Groups stories, you always can draw a picture to show the number of groups and the equal number in each group.

An easier way to solve Equal Groups problems is to use math.

Mary's 4 groups or bowls of strawberries times the 3 strawberries in each group or bowl gave her 12 strawberries in all. Mary has 12 strawberries. This is like the number sentence 4 times 3 is the same as 12.

Write $4 \times 3 = 12$ and __ = 12 with student.

The Equal Groups equation for this problem is GR times N is the same as P.

Write $GR \times N = P$.

GR (point) **stands for the number of groups. N** (point) **stands for the number *in* each group. P** (point) **stands for the product. When we multiply, we call the answer the product.**

What do we call the answer when we multiply?

The product.

What does GR (point) **stand for?**

The number of groups.

What does N (point) **stand for?**

The number *in* each group.

What does P (point) **stand for?**

The product.

 **You earn a treasure coin!**

Let's practice solving some Equal Groups problems!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

There are 8 teams in a soccer league. There are 11 players on each team. Each team has 3 coaches. How many players are in the soccer league?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 8; N = 11; P = __*
Irrelevant Information:	~~*Each team has 3 coaches.*~~
Number Sentence:	*8 × 11 = __*
Answer:	*__ = 88 players*

Follow steps on the UPS Check[2] poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total, Difference, and Change problems. Now we also know about Equal Groups problems. Let's use our What Do You Ask Yourself? poster to help us identify the schema.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**? If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount** (gesture)**? If you think it's an Equal Groups problem, ask yourself: Are there groups with an equal number in each group** (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount? Are there groups with an equal number in each group?

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount? Or is it about groups with an equal number in each group (gesture)**?**

Let's read the problem again.

"There are 8 teams in a soccer league. There are 11 players on each team. Each

team has 3 coaches. How many players are in the soccer league?"

This problem talks about teams: There are 8 teams in a soccer league. Each team has 11 players. The question asks how many players are in the soccer league. Is this a Total, Difference, Change, or Equal Groups problem?

Equal Groups.

Review Equal Groups dialogue again as needed.

If student is having trouble understanding Equal Groups, use the whiteboard with painter's tape and markers to illustrate the number of groups and the equal number in each group.

This problem is an Equal Groups problem because there are groups with an equal number in each group. How many groups do we have?

8.

Exactly. We have 8 groups or teams in the soccer league.

How many do we have in each group?

11.

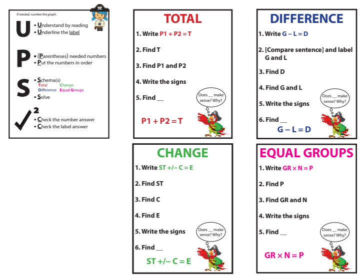
Right. We have 11 players on each of the 8 teams.

To remind me it's an Equal Groups problem, I write 1-EG next to the problem. 1 stands for the first step of solving. EG stands for Equal Groups problem.

Write 1-EG.

We said this is an Equal Groups problem. (Point to the EG.) **We use the Equal Groups poster to solve it.**

Display Large Schema Mat - Version 4 with Equal Groups poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is an Equal Groups problem, you're ready to solve it! We decided this is an Equal Groups problem, so we use this Equal Groups poster to solve it. This is the Equal Groups poster (point)**. We'll use it to help organize your work. To solve an Equal Groups problem, we have five steps. The steps are a lot like the Total, Difference, and Change steps.**

Step 1 is to write the Equal Groups equation. We write GR times N is the same as P. Let's write the Equal Groups equation now.

Write $GR \times N = P$*.*

Step 2: "Find P." What does P stand for?

The product.

That's right. We know P stands for the product because product starts with a P. We have to determine if the problem gives us the answer or product or if the problem asks us to find the answer or product.

In an Equal Groups problem, there are groups with an equal number in each group. The question helps us figure out whether we're finding the product, the number of groups, or the number in each group.

Look at the word problem again. The first sentence (point) **says, "There are 8 teams in a soccer league." The teams are the number of groups.** (Demonstrate the Equal Groups gesture. Hold one hand out with your palm flat to show the number of groups.)

The next sentence (point) **says, "There are 11 players on each team." The players on each team are the equal number in each group.** (Demonstrate the Equal Groups gesture. With your one hand out with your palm flat, use your other hand to pretend to place an object in the palm of your hand. Show that for one group or team, there are 11 players. Repeat the gesture for the number of groups you want to show. For this problem, repeat the gesture 8 times to show 8 groups with 11 in each group.)

The question asks, "How many players are in the soccer league?" (Demonstrate the Equal Groups gesture again.)

We know the number of groups and the number in each group, so the question is asking us to find the product. The missing part is the product, or P (point)**.**

In number sentences, how do we mark missing information?

With a blank.

Right. P is the missing information, so we put a blank in the number sentence under P. This helps to keep the work organized.

Write __ under P.

Step 3: "Find GR and N." First, let's find GR. What does GR stand for again?

The number of groups.

How many groups do we have?

8.

Exactly. We have 8 groups, or 8 teams in the soccer league.

Check off 8 in the story and write 8 underneath GR.
Continue to use whiteboards with painter's tape to illustrate the groups as needed.

Next, let's find N. What does N stand for again?

The number *in* each group.

How many do we have in each group?

11.

Exactly. We have 11 players in each group, or on each team.

Check off 11 in the story and write 11 underneath N.
Continue to use whiteboards with painter's tape to illustrate the equal number in each group as needed.

Step 4 says: "Write the signs." Equal Groups problems use a multiplication or times sign and the same as sign.

Write the multiplication sign and the same as sign.

8 stands for the number of groups. 11 stands for the number *in* each group. Blank stands for the product. Does this (point) **look like a number sentence we know how to solve?**

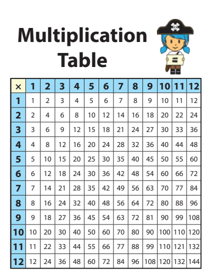
Yes!

Let's read the number sentence together.

Read number sentence aloud with student.

Step 5 says: "Find blank." Let's find blank! If you don't know the product off the top of your head because you are still learning your timestables, you can use the Multiplication Table poster to help you out.

Display Multiplication Table poster.



Provide guidance for using the Multiplication Table poster as needed.

What is blank?

88.

Great! In word problems, our answer must have a number and a label. We know the number answer is 88. Now we have to figure out what the label for 88 should be. Think about what the problem is mostly about. What did we underline?

Players.

Right! The problem is mostly about players, so that's the best label. We write players for the label!

Write players next to 88.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our product reasonable?

Yes!

Nice! Our product makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is players.

What word did we underline in our question sentence?

Players.

Exactly. We underlined players. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Good job working this Equal Groups problem! Let's try one more!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Vera went to the grocery store. She bought 6 pounds of potatoes. Each pound of potatoes costs $5.00. How much did Vera spend on potatoes?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 6; N = 5; P = __*
Number Sentence:	$6 \times 5 =$ __
Answer:	*__ = $30.00*

Follow steps on the UPS Check² poster.

Continue to use whiteboards with painter's tape and markers to illustrate the groups and the equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

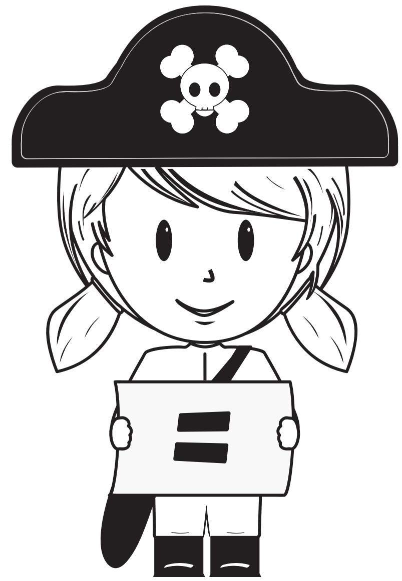
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 22

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Equal Groups with missing product
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 22
Buccaneer Problems: Lesson 22
Jolly Roger Review: Lesson 22
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Like yesterday, we will work on multiplication problems (point)**.**

We call problems with groups multiplied Equal Groups problems. We will continue talking about Equal Groups problems today. We can still solve these problems using the same steps we use to solve addition and subtraction equations.

Point to A.

Let's read the problem. 12 is the same as 4 times blank. Let's say that together.

12 is the same as 4 times blank.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. Our product is 12 (point)**. We have 4 groups** (point) **and we need to figure out the equal number in each group. We need to make 4 groups with an equal number in each group until we get to 12. Then we need to see how many are in each group. Let's go ahead and make 4 groups with an equal number in each group until we get to 12.**

(Makes groups.)

Monitor as student makes 4 groups of 3.

How many cubes are in each group of 4?

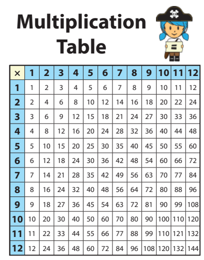
3.

Exactly! You made 4 groups with 3 in each group. So, 12 is the same as 4 times what?

3.

Exactly! 12 is the same as 4 times 3. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



To check our work, we put one finger on the 4 in the left blue row (point) **and another finger on the 3 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

12.

Nice! Our fingers met at 12, so we know our factors are correct. 12 is the same as 4 times 3. What is blank the same as?

3.

(Writes.)

Let’s read the number sentence together.

12 is the same as 4 times 3.

Let’s try another one.

Point to B.

Let’s read the problem. Blank times 3 is the same as 9. Let’s say that together.

Blank times 3 is the same as 9.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. Our product is 9 (point)**. We have 3 in each group** (point) **and we need to figure out the number of groups. We need to make groups with 3 in each group until we get to 9. Then, we need to see how many groups we have.**

Let's go ahead and make groups with 3 in each group until we get to 9.

(Makes groups.)

Monitor as student makes 3 groups of 3.

How many groups of 3 did you make?

3.

Exactly! You made 3 groups of 3. So, what times 3 is the same as 9?

3.

Exactly! 3 times 3 is the same as 9. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 3 in the left blue row (point) **and another finger on the 3 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

9.

Nice! Our fingers met at 9, so we know our factors are correct. 3 times 3 is the same as 9. What is blank the same as?

3.

(Writes.)

Let's read the number sentence together.

3 times 3 is the same as 9.

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, and Change problems. We also have learned about multi-step Total and Difference problems. Yesterday we started talking about Equal Groups problems.

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

Yesterday we started talking about Equal Groups problems. Today, we'll work on Equal Groups problems again. What kind of problem?

Equal Groups.

In Equal Groups problems, we make groups with an equal number in each group to find an answer, which we call the product (gesture)**.**

What does it mean to make an equal group?

(Responds.)

Exactly. When we have equal groups, we have groups with an equal number in each group (gesture)**. That's why these problems are called Equal Groups problems.**

What is our Equal Groups equation?

GR × N = P.

Great job! Let's say our Equal Groups equation again.

GR × N = P.

What does GR (point) **stand for?**

The number of groups.

What does N (point) **stand for?**

The number *in* each group.

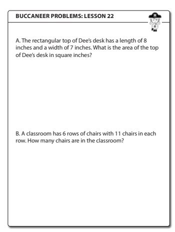
What does P (point) **stand for?**

The product.

Good! The product is just a fancy way to say the answer in a multiplication or Equal Groups problem.

Look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 22

A. The rectangular top of Dee's desk has a length of 8 inches and a width of 7 inches. What is the area of the top of Dee's desk in square inches?

B. A classroom has 6 rows of chairs with 11 chairs in each row. How many chairs are in the classroom?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem A:*</u>

The rectangular top of Dee's desk has a length of 8 inches and a width of 7 inches.

What is the area of the top of Dee's desk in square inches?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 7; N = 8; P = __*
Number Sentence:	*$7 \times 8 =$ __*
Answer:	*__ = 56 square inches*

Follow steps on the UPS Check² poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total, Difference, and Change problems. Now we also know about Equal Groups problems. Let's use our What Do You Ask Yourself? poster to help us identify the schema.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**? If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount** (gesture)**? If you think it's an Equal Groups problem, ask yourself: Are there groups with an equal number in each group** (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount? Are there groups with an equal number in each group?

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount? Or is it about groups with an equal

number in each group (gesture)**?**

Let's read the problem again.

"The rectangular top of Dee's desk has a length of 8 inches and a width of 7 inches. What is the area of the top of Dee's desk in square inches?"

Wait 10 seconds for student to think.

This problem has a new word in it. The problem says: What is the *area* of the top of Dee's desk in square inches? Have you heard the word "area" before?

(Responds.)

The area of a figure simply means the number of squares needed to cover a figure completely. Area is measured in "square" units. In this case, we are talking about the number of squares needed to cover Dee's desk.

To find the area of a figure like Dee's desk, we can multiply the length of the desk times the width of the desk.

What is the length of Dee's desk?

8.

Exactly. The length of the Dee's desk is 8 inches.

What is the width of Dee's desk?

7.

Exactly. The width of Dee's desk is 7 inches.

So, to find the area, we can multiply the length times the width, or 8 times 7.

What is 8 times 7? Use the Multiplication Table poster (point) **if you need help.**

56.

Exactly. The area of Dee's desk is 56. Remember, the area of a figure means the number of squares needed to cover the figure.

What is the area of a figure again?

(Responds.)

Do you want to hear a trick?

Yes!

When you are asked to find the *area* of a square or rectangle, like with Dee's desk, you are really being asked to solve an Equal Groups problem! The width of Dee's desk is like the number of groups and the length of Dee's desk is like the number in each group (gesture)**.**

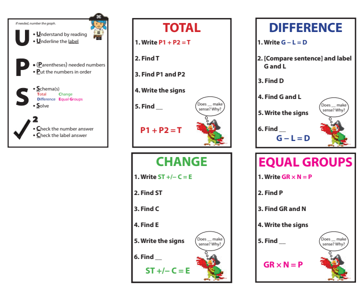
Let's solve this problem again, but this time let's follow our Equal Groups steps!

To remind me it's an Equal Groups problem, I write 1-EG next to the problem. 1 stands for the first step of solving. EG stands for Equal Groups problem.

Write 1-EG.

We said this is an Equal Groups problem. (Point to the EG.) **We use the Equal Groups poster to solve it.**

Display Large Schema Mat - Version 4 with Equal Groups poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is an Equal Groups problem, you're ready to solve it! We decided this is an Equal Groups problem, so we use this Equal Groups poster to solve it. This is the Equal Groups poster (point)**. We'll use it to help organize your work. To solve an Equal Groups problem, we have five steps. The steps are a lot like the Total, Difference, and Change steps.**

Step 1 is to write the Equal Groups equation. We write GR times N is the same as P. Let's write the Equal Groups equation now.

Write GR × N = P.

Step 2: "Find P." What does P stand for?

The product.

That's right. We know P stands for the product because product starts with a P. We have to determine if the problem gives us the answer or product or if the problem asks us to find the answer or product.

In an Equal Groups problem, there are groups with an equal number in each group. The question helps us figure out whether we're finding the product, the number of groups, or the number in each group.

Do we know the product or is the product missing?

The product is missing.

Exactly! We don't know the product, or the area of the desk. In number sentences, how do we mark missing information?

With a blank.

Right. P is the missing information, so we put a blank in the number sentence under P. This helps to keep the work organized.

Write __ under P.

Step 3: "Find GR and N." First, let's find GR. What does GR stand for again?

The number of groups.

We said the number of groups was like the width. How many groups do we have? What is the width?

7.

Exactly. The width of Dee's desk is 7 inches.

Check off 7 in the story and write 7 underneath GR.
Continue to use whiteboards with painter's tape to illustrate the groups as needed.

Next, let's find N. What does N stand for again?

The number *in* each group.

We said the number in each group was like the length. What is the length of Dee's desk?

8.

Exactly. The length of Dee's desk is 8 inches.

Check off 8 in the story and write 8 underneath N.
Continue to use whiteboards with painter's tape to illustrate the equal number in each group as needed.

Step 4 says: "Write the signs." Equal Groups problems use a multiplication or times sign and the same as sign.

Write the multiplication sign and the same as sign.

7 stands for the number of groups or width. 8 stands for the number *in* each group or length. Blank stands for the product. Does this (point) **look like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

Read number sentence aloud with student.

Step 5 says: "Find blank." Let's find blank! If you don't know the product off the top of your head because you are still learning your timestables, you can use the Multiplication Table poster to help you out.

Display Multiplication Table poster.
Provide guidance for using the Multiplication Table poster as needed.

What is blank?

56.

Great! In word problems, our answer must have a number and a label. We know the number answer is 56. Now we have to figure out what the label for 56 should be. Think about what the problem is mostly about. What did we underline?

Square inches.

Right! The problem is mostly about square inches, so that's the best label. Whenever we find the area, our label should have *square* before the measurement. To find the area means to find the square units needed to cover a figure.

What is the area?

The number of square units needed to cover a figure.

Nice! Let's write square inches for the label!

Write square inches next to 56.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our product reasonable?

Yes!

Nice! Our product makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is square inches.

What did we underline in our question sentence?

Square inches.

Exactly. We underlined square inches. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Good job working this Equal Groups problem! Let's try another!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

A classroom has 6 rows of chairs with 11 chairs in each row. How many chairs are in the classroom?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 6; N = 11; P = __*
Number Sentence:	*6 × 11 = __*
Answer:	*__ = 66 chairs*

Follow steps on the UPS Check² poster.
Continue to use whiteboards with painter's tape and markers to illustrate the groups and the equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Mr. Munoz packs 6 boxes with limes. Each box holds 100 limes. How many limes did Mr. Munoz pack into these boxes?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 6; N = 100; P = __*
Number Sentence:	*6 × 100 = __*

Answer: *__ = 600 limes*

Follow steps on the UPS Check^2 poster.
Continue to use whiteboards with painter's tape and markers to illustrate the groups and the equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

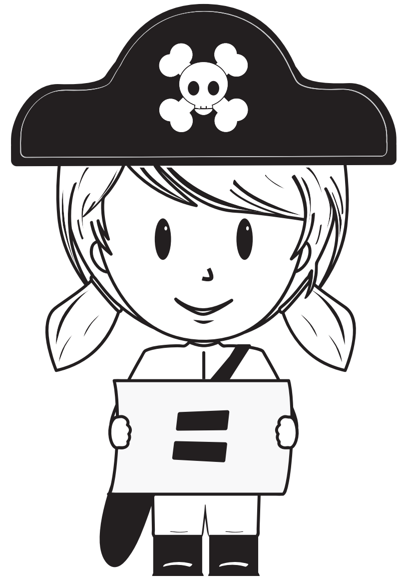
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 23

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Equal Groups with known product
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 23
Buccaneer Problems: Lesson 23
Jolly Roger Review: Lesson 23
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. But today the problems look a little different.

What is different about today's problems (point)**?**

The problems are division problems.

That's right! These problems are division problems. We still call problems with a product divided Equal Groups problems. The only difference is that we know the product now. We divide when the number of groups or the number *in* each group is missing. We will learn all about Equal Groups problems today where we divide. We can still solve these problems using the same steps we use to solve addition, subtraction, and multiplication equations.

Point to A.

Let's read the problem. 10 divided by 5 is the same as blank. Let's say that together.

10 divided by 5 is the same as blank.

What do we need to do to balance both of the sides?

Divide 10 by 5.

Exactly. 10 is our product (point)**. 5 is the number of groups** (point)**. We need to find the number *in* each group. We can divide to find the number in each group. We also can think about 10 as our dividend and 5 as our divisor. We divide the dividend by the divisor to find our answer, or quotient.**

We can divide to make the two sides the same. What should we divide?

10 divided by 5.

Yes! Let's use cubes to solve this problem. If we have 10 and we want to divide by 5, we need to divide the 10 into 5 groups. Go ahead and count out 10 cubes.

(Counts.)

Now what do we need to do?

Make 5 groups.

Nice! Let's divide the 10 into 5 groups.

(Divides.)

Guide student to make 5 groups with 2 cubes in each group.

Now, how many cubes are in each group of 5?

2.

Nice! So what is 10 divided by 5? How many cubes do we have in each of the 5 groups?

2.

Exactly! 10 divided by 5 is the same as 2. What is blank the same as?

2.

(Writes.)

Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we identify our divisor as 5 (point)**. Then, we find the left blue row starting with 5 and put a finger on the 5** (point)**. Then, we slide our finger over until we get to 10, our dividend. Then, we slide our finger up from**

the 10 to the top of the blue column (point)**. At the top of the blue column, we see the number 2** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

2.

Nice! So what is our quotient, or answer?

2.

Exactly! 10 divided by 5 is the same as 2. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

10 divided by 5 is the same as 2.

Let's try another one.

Point to B.

Let's read the problem. Blank is the same as 8 divided by 4. Let's say that together.

Blank is the same as 8 divided by 4.

What do we need to do to balance both of the sides?

Divide 8 by 4.

Exactly. 8 is our product (point)**. 4 is the number of groups** (point)**. We need to find the number *in* each group. We can divide to find the number in each group. We also can think about 8 as our dividend and 4 as our divisor. We divide the dividend by the divisor to find our answer, or quotient.**

We can divide to make the two sides the same. What should we divide?

8 divided by 4.

Yes! Let’s use cubes to solve this problem. If we have 8 and we want to divide by 4, we need to divide the 8 into 4 groups. Go ahead and count out 8 cubes.

(Counts.)

Now what do we need to do?

Make 4 groups.

Nice! Let's divide the 8 into 4 groups.

(Divides.)

Guide student to make 4 groups with 2 cubes in each group.

Now, how many cubes are in each group of 4?

2.

Nice! So what is 8 divided by 4? How many cubes do we have in each of the 4 groups?

2.

Exactly! 8 divided by 4 is the same as 2. What is blank the same as?

2.

(Writes.)

Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we identify our divisor as 4 (point)**. Then, we find the left blue row starting with 4 and put a finger on the 4** (point)**. Then, we slide our finger over until we get to 8, our dividend. Then, we slide our finger up from**

the 8 to the top of the blue column (point)**. At the top of the blue column, we see the number 2** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

2.

Nice! So what is our quotient, or answer?

2.

Exactly! 8 divided by 4 is the same as 2. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

2 is the same as 8 divided by 4.

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, Change, and Equal Groups problems. We also have learned about multi-step Total and Difference problems. Today we are going to continue to talk about Equal Groups problems. We are going to learn about a different type of Equal Groups problem. We are going to talk about Equal Groups problems with a known product where we need to divide to find the quotient!

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

We recently learned about Equal Groups problems. How do you know if it's an Equal Groups problem?

When you have groups with an equal number in each group.

Good! Equal Groups problems have groups with an equal number in each group.

What is our Equal Groups equation?

GR × N = P.

Great job! Let's say our Equal Groups equation again.

GR × N = P.

Today, we'll learn about Equal Groups problems where we know the product. These problems are a lot like Equal Groups problems where the product is missing. The only difference is that in Equal Groups problems where we know the product, we share the product equally among the groups. This means we divide!

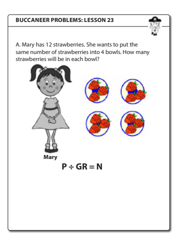
What does it mean when we have an Equal Groups problem where we know the product?

(Responds.)

Exactly. When we have an Equal Groups problems where we know the product, we share the product equally among the groups and we divide!

Let me show you what I mean. Look at this problem.

Point to A.



"Mary has 12 strawberries. She wants to put the same number of strawberries into 4 bowls. How many strawberries will be in each bowl?"

This is an Equal Groups story because the story tells us that Mary has 12 strawberries, and she wants to share them equally among 4 bowls.

How many strawberries does Mary have?

12.

Exactly. Mary has 12 strawberries. Mary wants to put the same number of strawberries into 4 bowls.

Remind me what same number means?

An equal amount.

Exactly. Mary wants to put the same number or an equal amount of strawberries in each of her bowls.

How many bowls does Mary have?

4.

Good! This is an Equal Groups story because Mary has 12 strawberries and she wants to share the 12 strawberries equally among 4 bowls.

Circle 12 and 4 in the story.

Here's the number sentence that goes with this story: 12 divided by 4 is the same as blank.

Write 12 ÷ 4 = ___.

This number sentence stands for what's happening in this Equal Groups story. Mary has 12 strawberries and she wants to share them equally among 4 bowls. How many strawberries does Mary have?

12.

Right. She has 12 strawberries.

She wants to put an equal number of strawberries in each bowl. How many bowls does she have?

4.

Right. Mary has 12 strawberries that she wants to share equally among 4

bowls. That's like the number sentence: 12 divided by 4 is the same as blank. Let me show you how this works.

This is a picture of Mary and her strawberries (point)**. Mary's name is written here** (point)**. Mary's strawberries are shown here** (point)**. Look at the bowls of strawberries outlined by the circles. Each bowl stands for one group. How many groups of strawberries or circles do you count?**

Count the 4 groups of strawberries with student, using the picture as a guide.

4.

That's right. We know Mary has 4 groups of strawberries because we see the 4 bowls, which stand for 4 groups.

In *this* Equal Groups problem, the story tells us the product, or the total number of strawberries. The story also tells us the number of groups. The story asks us to find the number in each group. In this problem, Mary plans to share the 12 strawberries equally among her 4 bowls. We need to find out how many strawberries will be in each bowl.

Let's review. Mary has 12 strawberries. This is our product. She wants to share the 12 strawberries equally among 4 bowls, which is our number of groups. We need to find the number in each group. (Demonstrate the Equal Groups gesture with a known product to show that the number in each group is missing. Hold both hands out in front of you to make a large circle. Then, use one hand to pretend to place an object outside of the circle. Show that the product, the 12 strawberries, will be shared equally among 4 groups. Repeat the gesture for the number of groups you want to show. For this problem, repeat the gesture 4 times to show 4 groups)**.**

To find out how many strawberries will be in each bowl, we can count the number of strawberries in one of the bowls.

Count the number of strawberries in one of the bowls, using the picture as a guide.

How many strawberries does Mary have in each bowl?

3.

Exactly! Mary has 3 strawberries in each of her 4 bowls!

For Equal Groups stories with a known product, you always can draw a picture to show the product and the number of groups.

An easier way to solve Equal Groups problems is to do math.

Mary shared her 12 strawberries equally among 4 groups or bowls. There were 3 strawberries in each bowl. This is like the number sentence 12 divided by 4 is the same as 3.

Write $12 \div 4 =$ __ *and* __ $= 3$ *with student.*

The Equal Groups equation for Equal Groups problems with a known product is P divided by GR is the same as N. We use this equation whenever we solve an Equal Groups problem with a known product. We also can think about these problems as division problems where we divide the dividend by the divisor to find the quotient.

When do we use this equation?

(Responds.)

Exactly! Now let's write the Equal Groups equation we use when we know the product, or when we need to divide.

Write $P \div GR = N$.

P (point) **stands for the product. GR** (point) **stands for the number of groups. N** (point) **stands for the number *in* each group.**

What does P (point) **stand for?**

The product.

What does GR (point) **stand for?**

The number of groups.

What does N (point) **stand for?**

The number *in* each group.

Now before we practice solving Equal Groups problems with a known product, let's look back at our picture of Mary and the strawberries (point)**. Where have you seen a picture like this before?**

(Responds.)

You're right! We saw the picture of Mary and the strawberries when we first started talking about Equal Groups problems with a missing product. We used the picture of Mary and the strawberries to learn about Equal Groups problems with a known product too.

Want to know why?

(Responds.)

When we have Equal Groups problems with a missing product, we multiply. When we have Equal Groups problems with a known product, we divide. You can think of these two types of Equal Groups problems as related, like cousins. How can we think of the two types of Equal Groups problems?

As cousins.

Exactly! Let's think back to our Equal Groups problems with a missing product. In Equal Groups problems with a missing product, we have groups with an equal number in each group (gesture)**. Mary had 4 bowls, or groups, with an equal number of strawberries, 3 strawberries, in each group** (point to picture)**.**

In Equal Groups problems with a known product, we have a product shared equally among groups (gesture)**. Mary had 12 strawberries shared equally among 4 groups, or bowls** (point to picture)**.**

Remind me, what's our Equal Groups equation with a missing product?

GR × N = P.

Exactly! Let's write GR × N = P on our paper under our Equal Groups equation for Equal Groups problems with a known product (point)**.**

P ÷ GR = N.
Write GR × N = P.

What do you notice?

(Responds.)

Nice! Both of the Equal Groups equations use the same letters. In Equal Groups problems with a missing product, we make groups, GR, with an equal number in each group, N, to find the product, P.

In Equal Groups problems with a known product, we have a product, P, shared equally among groups, GR, to find the number in each group, N. We also can think about these problems as division problems where we divide the dividend by the divisor to find the quotient.

These two types of Equal Groups problems are like cousins. They're really similar. Remind me, how are they similar?

(Responds.)

Nice! They have the same letters.

And how are they different?

(Responds.)

Exactly! In Equal Groups problems with a missing product, we make *groups* with an equal number in each group. In Equal Groups problems with a known product, we *share* a product equally among groups (gesture)**.**

What operation do we use to solve an Equal Groups problem with a missing product?

Multiplication.

Yes! And what operation do we use to solve an Equal Groups problem with a known product?

Division.

Excellent! Always remember, these two types of Equal Groups problems are like relatives. You can think of these two types of Equal Groups problems as belonging together.

You earn a treasure coin!

Now that we have reviewed Equal Groups problems with a known product, let's practice solving some of these problems!

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Ms. Losoya has 72 Starbursts. She will arrange the Starbursts in 6 equal stacks. How many Starbursts will be in each stack?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 72; GR = 6; N = __*
Number Sentence:	*72 ÷ 6 = __*
Answer:	*__ = 12 Starbursts*

Follow steps on the UPS Check^2 poster.
When you get to the first "S" follow script below.

Point to the first S.

The first S stands for, "Schemas." Say that word with me.

Schemas.

Remember, you have to think hard to identify the schema. Recently, we only knew about Total, Difference, Change, and Equal Groups problems with a missing product. Now we also know about Equal Groups problems with a

known product. Let's use our What Do You Ask Yourself? poster to help us identify the schema.

Display What Do You Ask Yourself? poster and gesture and question with student.

Let's ask these questions together.

If you think it's a Total problem, ask yourself: Are parts put together into a total? If you think it's a Difference problem, ask yourself: Are two amounts compared for a difference (gesture)**? If you think it's a Change problem, ask yourself: Is there a starting amount that increases or decreases to a new amount** (gesture)**? If you think it's an Equal Groups problem, ask yourself: Are there groups with an equal number in each group** (gesture)**?**

Let's review. What questions do we need to ask ourselves? Remember to gesture as you question.

Are parts put together for a total? Are two amounts compared for a difference? Is there a starting amount that increases or decreases to a new amount? Are there groups with an equal number in each group?

Let's decide. Is this problem about parts and a total? Or is it about two amounts compared for a difference? Or is it about a starting amount that increases or decreases to a new amount? Or is it about groups with an equal number in each group? (gesture)**?**

Let's read the problem again.

"Ms. Losoya has 72 Starbursts. She will arrange the Starbursts in 6 equal stacks. How many Starbursts will be in each stack?"

This problem talks about Starbursts: There are 72 Starbursts. The Starbursts will be arranged in 6 equal stacks. The question asks how many Starbursts will be in each stack. Is this a Total, Difference, Change, or Equal Groups problem?

Equal Groups.

Review Equal Groups dialogue again as needed.

If student is having trouble understanding Equal Groups as a product shared equally among groups, use the whiteboard with painter's tape and markers to illustrate the *product shared equally among groups.*

This problem is an Equal Groups problem because there is a product shared equally among groups. What is our product? How many Starbursts does Ms. Losoya have?

72.

Exactly. Ms. Losoya has 72 Starbursts to arrange into stacks. Into how many stacks will Ms. Losoya arrange the Starbursts?

6.

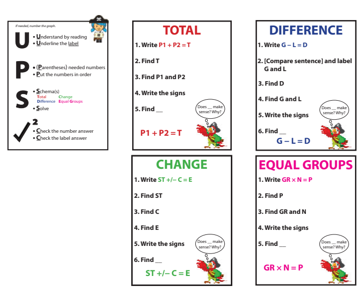
Right. Ms. Losoya will arrange the 72 Starbursts into 6 equal stacks.

To remind me it's an Equal Grouos problem, I write 1-EG next to the problem. 1 stands for the first step of solving. EG stands for Equal Groups problem.

Write 1-EG.

We said this is an Equal Groups problem. (Point to the EG.) **We use the Equal Groups poster to solve it.**

Display Large Schema Mat - Version 4 with Equal Groups poster.



Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

Point to the second S.

The second S stands for, "Solve." Now that we know the problem is an Equal

Groups problem, you're ready to solve it! We decided this is an Equal Groups problem, so we use this Equal Groups poster to solve it. This is the Equal Groups poster (point)**. We'll use it to help organize your work. To solve an Equal Groups problem, we have five steps.**

Step 1 is to write the Equal Groups equation. We could write GR times N is the same as P, but you know what is easier?

(Responds.)

We know this is an Equal Groups problem with a *known* product, so we know we need to divide. Let's write P divided by GR is the same as N. You also could think of this problem as a division problems where we divide the dividend by the divisor to find the quotient. Let's write the Equal Groups equation with a known product now.

Write P ÷ GR = N.

Step 2: "Find N." What does N stand for?

The number in each group.

That's right. We know N stands for the number in each group. We have to determine if the problem gives us the number in each group or if the problem asks us to find the number in each group.

In an Equal Groups problem with a known product, there is a product shared equally among groups. The question helps us figure out whether we're finding the product, the number of groups, or the number in each group.

What happens in an Equal Groups problem with a known product?

(Responds.)

Look at the word problem again. The first sentence (point) **says, "Ms. Losoya has 72 Starbursts." The Starbursts are the product.** (Demonstrate the Equal Groups with a known product gesture. Hold both hands out in front of you to make a large circle.)

The next sentence (point) **says, "She will arrange the Starbursts in 6 equal stacks." The 6 equal stacks are the number of groups. (**Use one hand to pretend to place an object outside of the circle. Show that the product, the 72 Starbursts, will be shared equally among 6 stacks. Repeat the gesture for the number of groups you want to show. For this problem, repeat the gesture 6 times to show 6 groups)**.**

The question asks, "How many Starbursts will be in each stack?" (Demonstrate the Equal Groups with a known product gesture again.)

We know the product and the number of groups, so the question is asking us to find the number in each group. The missing part is the number in each group, or N (point)**.**

In number sentences, how do we mark missing information?

With a blank.

Right. N is the missing information, so we put a blank in the number sentence under N. This helps to keep the work organized.

Write __ under N.

Step 3: "Find P and GR." First, let's find P. What does P stand for again?

The product.

What is the product? How many Starbursts does Ms. Losoya have?

72.

Exactly. Ms. Losoya has 72 Starbursts to share, so the product is 72.

Check off 72 in the story and write 72 underneath GR.
Continue to use whiteboards with painter's tape to illustrate the product as needed.

Next, let's find GR. What does GR stand for again?

The number of groups.

How many groups do we have? How many stacks of Starbursts are there?

6.

Exactly. Ms. Losoya will arrange the Starbursts into 6 equal stacks.

Check off 6 in the story and write 6 underneath GR.
Continue to use whiteboards with painter's tape to illustrate the number of groups as needed.

Step 4 says: "Write the signs." Equal Groups problems with a known product use a division sign and the same as sign.

Write the division sign and the same as sign.

72 stands for the product. 6 stands for the number of groups. Blank stands for the number in each group. Does this (point) **look like a number sentence we know how to solve?**

Yes!

Let's read the number sentence together.

Read number sentence aloud with student.

Step 5 says: "Find blank." Let's find blank! If you don't know the number in each group off the top of your head because you are still learning your timestables, you can use the Multiplication Table poster to help you out.

Display Multiplication Table poster.

Provide guidance for using the Multiplication Table poster as needed.

What is blank?

12.

Great! In word problems, our answer must have a number and a label. We know the number answer is 12. Now we have to figure out what the label for 12 should be. Think about what the problem is mostly about. What did we underline?

Starbursts.

Right! The problem is mostly about Starbursts, so that's the best label. We

write Starbursts for the label!

Write Starbursts next to 12.

Nice! Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense.

Is our quotient reasonable?

Yes!

Nice! Our quotient makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is Starbursts.

What word did we underline in our question sentence?

Starbursts.

Exactly. We underlined Starbursts. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Good job working this Equal Groups problem with a known product! Let's try one more!

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

In math class, 5 students split up 60 flashcards to practice their math facts. Each student took the same number of flashcards. How many flashcards did each student take?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 60; GR = 5; N = __*
Number Sentence:	*60 ÷ 5 = __*
Answer:	*__ = 12 flashcards*

Follow steps on the UPS Check^2 poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

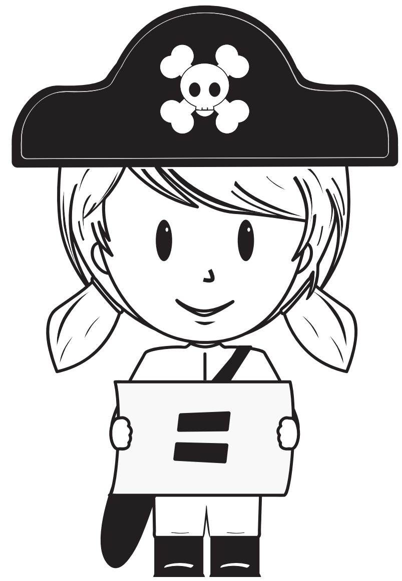
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 24

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
    Equal Groups with known product
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 24
Buccaneer Problems: Lesson 24
Jolly Roger Review: Lesson 24
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let’s get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on multiplication and division problems (point)**.**

We call problems with groups multiplied Equal Groups problems. We also call problems with a product divided Equal Groups problems.

Point to A.

Let's read the problem. 15 divided by blank is the same as 5. Let's say that together.

15 divided by blank is the same as 5.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need to find out how many groups we can make from 15 when we share the 15 equally among groups. We need to have 5 in each group. Let's go ahead and draw our product.

What's our product?

15.

Good! Let's draw 15 squares here (point to the left box)**.**

(Draws.)

How many groups do we need to make?

We don't know.

Exactly! We don't know the number of groups. That is what we are trying to find out.

How many need to be *in* each group?

5.

Exactly! Let's go ahead and draw a big circle around each group of 5 squares.

(Draws.)

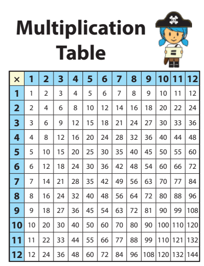
Guide student to draw a big circle around each group of 5 squares.

How many big circles did you draw?

3.

Exactly! You drew 3 big circles, which means that there are 3 groups. 15 divided by 3 is the same as 5. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



To check our work, we identify our divisor as 3 (point)**. Then, we find the left blue row starting with 3 and put a finger on the 3** (point)**. Then, we slide our finger over until we get to 15, our dividend. Then, we slide our finger up from the 15 to the top of the blue column** (point)**. At the top of the blue column, we see the number 5, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

5.

Exactly! We know our numbers are correct. 15 divided by 3 is the same as 5.

What is blank the same as?

3.

(Write.)

Let’s read the number sentence together.

15 divided by 3 is the same as 5.

Let’s try another one.

Point to B.

Let’s read the problem. Blank times 4 is the same as 12. Let’s say that together.

Blank times 4 is the same as 12.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. Our product is 12 (point)**. We have 4 in each group** (point) **and we need to figure out the number of groups. We need to make groups with 4 in each group until we get to 12. Then, we need to see how many groups we have.**

Let's go ahead and make groups with 4 in each group until we get to 12. Let's draw triangles.

(Makes groups.)

Monitor as student makes 3 groups of 4 triangles.

How many groups of 4 did you make?

3.

Exactly! You made 3 groups of 4. So, what times 4 is the same as 12?

3.

Exactly! 3 times 4 is the same as 12. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 3 in the left blue row (point) **and another finger on the 4 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

12.

Nice! Our fingers met at 12, so we know our factors are correct. 3 times 4 is the same as 12. What is blank the same as?

3.

(Write.)

Let's read the number sentence together.

3 times 4 is the same as 12.

Let's try one more!

Point to C.

Use dialogue from Problem B to solve C.

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, Change, and Equal Groups problems. We also have learned about multi-step Total and Difference problems. Yesterday we started talking about Equal Groups problems with a known product.

What kind of problems?

Equal Groups problems with a known product.

Exactly! We started talking about Equal Groups problems with a known product yesterday.

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change

equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

How do you know if it's an Equal Groups problem?

When you have groups with an equal number in each group.

Good! Equal Groups problems have groups with an equal number in each group.

What is our Equal Groups equation?

GR × N = P.

Great job! Let's say our Equal Groups equation again.

GR × N = P.

Yesterday we started talking about Equal Groups problems with a known product. Today, we'll work on Equal Groups problems with a known product again. What kind of problem?

Equal Groups problems with a known product.

In Equal Groups problems with a known product, there is a product shared equally among groups (gesture)**.**

What does it mean to share a product equally?

(Responds.)

Exactly. When we share a product equally, we have a product shared equally among groups (gesture)**.**

We always can use the GR times N is the same as P equation to solve an Equal Groups problem with a known product. But do you want to know another

equation we can use that's easier?

(Responds.)

When we have an Equal Groups problem with a known product, we divide. We can think of the dividend divided by the divisor to find the quotient. So we can use the equation we learned yesterday for solving Equal Groups problems with a known product. Do you remember the equation we learned yesterday?

P ÷ GR = N.

Great job! Let's say our Equal Groups equation when we know the product again.

P ÷ GR = N.

What does P (point) **stand for?**

The product.

What does GR (point) **stand for?**

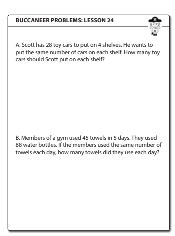
The number of groups.

What does N (point) **stand for?**

The number *in* each group.

Nice job with that review! Let's look at this problem.

Point to A.



BUCCANEER PROBLEMS: LESSON 24

A. Scott has 28 toy cars to put on 4 shelves. He wants to put the same number of cars on each shelf. How many toy cars should Scott put on each shelf?

B. Members of a gym used 45 towels in 5 days. They used 88 water bottles. If the members used the same number of towels each day, how many towels did they use each day?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem A:

Scott has 28 toy cars to put on 4 shelves. He wants to put the same number of cars on each shelf. How many toy cars should Scott put on each shelf?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 28; GR = 4; N = __*
Number Sentence:	*28 ÷ 4 = __*
Answer:	*__ = 7 toy cars*

Follow steps on the UPS $Check^2$ poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Members of a gym used 45 towels in 5 days. They used 88 water bottles. If the members used the same number of towels each day, how many towels did they

use each day?
Problem Type: *Equal Groups*
Relevant Information: *P = 45; GR = 5; N = __*
Irrelevant Information: ~~*They used 88 water bottles.*~~
Number Sentence: *45 ÷ 5 = __*
Answer: *__ = 9 towels*

Follow steps on the UPS Check² poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Mr. Whitmore will deliver a total of 63 cases of water to 7 different grocery stores today. He will deliver the same number of cases of water to each grocery store. How many cases of water will Mr. Whitmore deliver to each grocery store?
Problem Type: *Equal Groups*
Relevant Information: *P = 63; GR = 7; N = __*
Number Sentence: *63 ÷ 7 = __*
Answer: *__ = 9 cases of water*

Follow steps on the UPS Check² poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

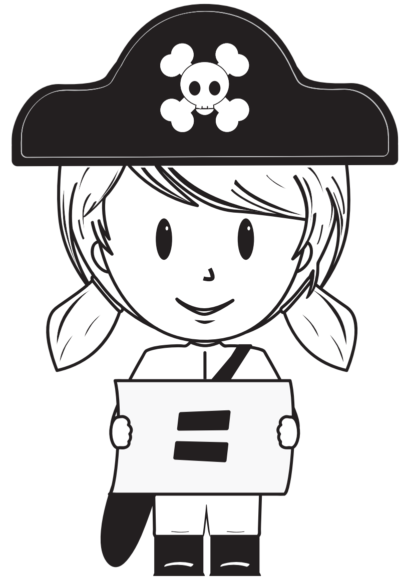
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 25

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 25
Buccaneer Problems: Lesson 25
Jolly Roger Review: Lesson 25
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on multiplication and division problems (point)**.**

We call problems with groups multiplied Equal Groups problems. We also call problems with a product divided Equal Groups problems.

Point to A.

Let's read the problem. 16 divided by 4 is the same as blank. Let's say that together.

16 divided by 4 is the same as blank.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need share the 16 equally among 4 groups to determine how many are in each group. Let's go ahead and draw our product. Remember, we also can think about this as the dividend, 16, divided by the divisor, 4, to find our answer, or quotient.

What's our product?

16.

Good! Let's draw 16 squares here (point to the left box)**.**

(Draws.)

How many groups do we need to make?

4.

Exactly! We know there are 4 groups. Let's go ahead and draw 4 big circles and let's make sure we have the same number of squares in each big circle.

Guide student to draw a big circle around each group of 4 squares.

Now, we need to find out how many squares are *in* each group of 4. Let's look. How many squares are in each big circle? How many are *in* each group?

4.

Exactly! There are 4 squares in each of the 4 big circles, which means there are 4 in each group. 16 divided by 4 is the same as 4. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we identify our divisor as 4 (point)**. Then, we find the left blue row starting with 4 and put a finger on the 4** (point)**. Then, we slide our finger over until we get to 16, our dividend. Then, we slide our finger up from the 16 to the top of the blue column** (point)**. At the top of the blue column, we see the number 4, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

4.

Exactly! We know our numbers are correct. 16 divided by 4 is the same as 4. What is blank the same as?

4.

(Writes.)

Let’s read the number sentence together.

16 divided by 4 is the same as 4.

Let's try another one.

Point to B.

Let's read the problem. 3 times blank is the same as 18. Let's say that together.

3 times blank is the same as 18.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. Our product is 18 (point)**. We have 3 groups** (point) **and we need to figure out the number *in* each group. We need to make 3 groups with the same number in each group until we get to 18. Then, we need to see how many we have in each group.**

Let's go ahead and make 3 groups with the same number in each group until we get to 18. Let's draw triangles.

(Makes groups.)

Monitor as student makes 3 groups of 6 triangles.

How many triangles are in each of your 3 groups?

6.

Exactly! You made 3 groups of 6. So, 3 times what is the same as 18?

6.

Exactly! 3 times 6 is the same as 18. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 3 in the left blue row (point) **and another finger on the 6 in the top blue column** (point)**. Then, we slide our two**

fingers together and find the box where they meet (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

18.

Nice! Our fingers met at 18, so we know our factors are correct. 3 times 6 is the same as 18. What is blank the same as?

6.

(Writes.)

Let's read the number sentence together.

3 times 6 is the same as 18.

Let's try one more!

Point to C.

Let's read the problem. Blank times 5 is the same as 10. Let's say that together.

Blank times 5 is the same as 10.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. Our product is 10 (point)**. We have 5 in each group** (point) **and we need to figure out the number of groups. We need to make groups with 5 in each group until we get to 10. Then, we need to see how many groups we have.**

Let's go ahead and make groups with 5 in each group until we get to 10. Let's draw triangles.

(Makes groups.)

Monitor as student makes 2 groups of 5 triangles.

How many groups of 5 did you make?

2.

Exactly! You made 2 groups of 5. So, what times 5 is the same as 10?

2.

Exactly! 2 times 5 is the same as 10. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 2 in the left blue row (point) **and another finger on the 5 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

10.

Nice! Our fingers met at 10, so we know our factors are correct. 2 times 5 is the same as 10. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

2 times 5 is the same as 10.

Nice work!

Remember, it doesn't matter where the equal sign or blank is in an equation,

we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, Change, and Equal Groups problems. We also have learned about multi-step Total and Difference problems. Recently we started talking about Equal Groups problems with a known product.

What kind of problems?

(Responds.)

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

How do you know if it's an Equal Groups problem?

When you have groups with an equal number in each group.

Good! Equal Groups problems have groups with an equal number in each group.

What is our Equal Groups equation?

GR × N = P.

Great job! Let's say our Equal Groups equation again.

GR × N = P.

Recently we started talking about Equal Groups problems with a known product. How do you know if it's an Equal Groups problem with a known product?

In Equal Groups problems with a known product, there is a product shared equally among groups.

Exactly. When we have equal groups with a known product, we have a product shared equally among groups (gesture)**.**

We always can use our Equal Groups equation to solve Equal Groups problems with a known product. But what is another equation we can use that might be easier?

P ÷ GR = N.

Great job! Let’s say that equation again.

$P \div GR = N$.

What does P (point) **stand for?**

The product.

What does GR (point) **stand for?**

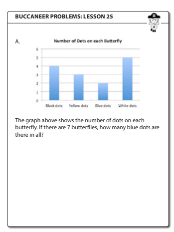
The number of groups.

What does N (point) **stand for?**

The number *in* each group.

Nice job with that review! Let's look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 25

A.

The graph above shows the number of dots on each butterfly. If there are 7 butterflies, how many blue dots are there in all?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

What do we need to do?

Number it.

Good! Let's go ahead and number it.

(Numbers.)

<u>Solution to Problem A:</u>

The graph above shows the number of dots on each butterfly. If there are 7 butterflies, how many blue dots are there in all?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 7; N = 2; P = __*
Irrelevant Information:	~~*Black dots, Yellow dots, White dots*~~
Number Sentence:	$7 \times 2 =$ __
Answer:	*__ = 14 blue dots*

Follow steps on the UPS Check² poster.
Continue to use whiteboards with painter's tape and markers to illustrate the groups with an equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

A science teacher put 56 marbles into 8 cups. He put the same number of marbles into each cup. How many marbles did the science teacher put into each cup?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 56; GR = 8; N = __*
Number Sentence:	$56 \div 8 =$ __
Answer:	*__ = 7 marbles*

Follow steps on the UPS Check² poster.

Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

Juliet's picture frame has a length of 25 cm and a width of 4 cm. What is the area of the picture frame in square centimeters?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 25; N = 4; P = ___*
Number Sentence:	*25 × 4 = ___*
Answer:	*___ = 100 square centimeters*

Follow steps on the UPS Check^2 poster.
Review that area is the number of square units needed to cover a figure.
Review that we find the area by multiplying the length times the width.
Continue to use whiteboards with painter's tape and markers to illustrate the groups with an equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

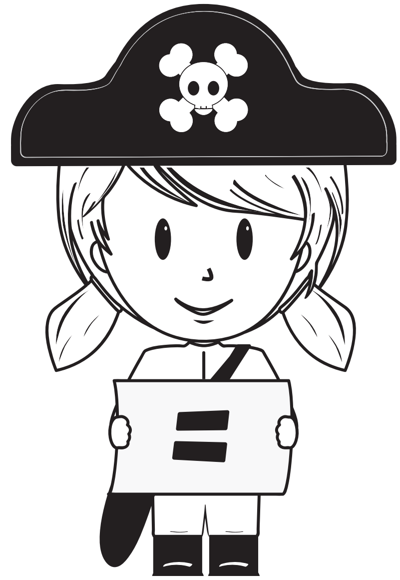
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 26

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Counting Up
What Do You Ask Yourself?
Multiplication Table
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 26
Buccaneer Problems: Lesson 26
Jolly Roger Review: Lesson 26
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box
Whiteboard/Markers

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on multiplication and division problems (point)**.**

We call problems with groups multiplied Equal Groups problems. We also call problems with a product divided Equal Groups problems.

Point to A.

Let's read the problem. 18 divided by blank is the same as 2. Let's say that together.

18 divided by blank is the same as 2.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need to find out how many groups we can make from 18 when we share the 18 equally among groups. We need to have 2 in each group. Let's go ahead and draw our product.

What's our product?

18.

Good! Let's draw 18 squares here (point to the left box)**.**

(Draws.)

How many groups do we need to make?

We don't know.

Exactly! We don't know the number of groups. That is what we are trying to find out.

How many need to be *in* each group?

2.

Exactly! Let's go ahead and draw a big circle around each group of 2 squares.

(Draws.)

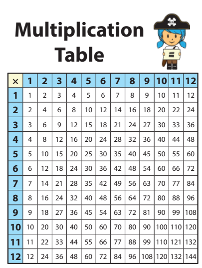
Guide student to draw a big circle around each group of 2 squares.

How many big circles did you draw?

9.

Exactly! You drew 9 big circles, which means that there are 9 groups. 18 divided by 9 is the same as 2. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we identify our divisor as 9 (point)**. Then, we find the left blue row starting with 9 and put a finger on the 9** (point)**. Then, we slide our finger over until we get to 18, our dividend. Then, we slide our finger up from the 18 to the top of the blue column** (point)**. At the top of the blue column, we see the number 2, the quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

2.

Exactly! We know our numbers are correct. 18 divided by 9 is the same as 2. What is blank the same as?

9.

(Writes.)

Let’s read the number sentence together.

18 divided by 9 is the same as 2.

Let’s try another one.

Point to B.

Let’s read the problem. Blank times 4 is the same as 24. Let’s say that together.

Blank times 4 is the same as 24.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. Our product is 24 (point)**. We have 4 in each group** (point) **and we need to figure out the number of groups. We need to make groups with 4 in each group until we get to 24. Then, we need to see how many groups we have.**

Let's go ahead and make groups with 4 in each group until we get to 24. Let's draw triangles.

(Makes groups.)

Monitor as student makes 6 groups of 4 triangles.

How many groups of 4 did you make?

6.

Exactly! You made 6 groups of 4. So, what times 4 is the same as 24?

6.

Exactly! 6 times 4 is the same as 24. Now let's use our Multiplication Table

poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 6 in the left blue row (point) **and another finger on the 4 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

24.

Nice! Our fingers met at 24, so we know our factors are correct. 6 times 4 is the same as 24. What is blank the same as?

6.

(Writes.)

Let's read the number sentence together.

6 times 4 is the same as 24.

Let's try one more!

Point to C.

Let's read the problem. Blank is the same as 21 divided by 3. Let's say that together.

Blank is the same as 21 divided by 3.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need share the 21 equally among 3 groups to determine how many are in each group. Let's go

ahead and draw our product.

What's our product?

21.

Good! Let's draw 21 squares here (point to the right box)**.**

(Draws.)

How many groups do we need to make?

3.

Exactly! We know there are 3 groups. Let's go ahead and draw 3 big circles and let's make sure we have the same number of squares in each big circle.

Guide student to draw a big circle around each group of 7 squares.

Now, we need to find out how many squares are *in* each group of 3. Let's look. How many squares are in each big circle? How many are *in* each group?

7.

Exactly! There are 7 squares in each of the 3 big circles, which means there are 7 in each group. 7 is the same as 21 divided by 3. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we identify our divisor as 3 (point)**. Then, we find the left blue row starting with 3 and put a finger on the 3** (point)**. Then, we slide our finger over until we get to 21, our dividend. Then, we slide our finger up from the 21 to the top of the blue column** (point)**. At the top of the blue column, we see the number 7, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

7.

Exactly! We know our numbers are correct. 7 is the same as 21 divided by 3. What is blank the same as?

7.

(Writes.)

Let's read the number sentence together.

7 is the same as 21 divided by 3.

Nice work!

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Over the last few weeks, we've learned about Total, Difference, Change, and Equal Groups problems. We also have learned about multi-step Total and Difference problems. Recently we started talking about Equal Groups problems with a known product.

What kind of problems?

(Responds.)

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

When you see a word problem, how do you know if it's a Total problem?

When you put parts together into a total.

Good. In Total problems, parts are put together into a total. Sometimes the missing information is the total. Other times, the missing information is one of the parts.

What's the Total equation?

P1 + P2 = T.

Good. Say it again.

P1 + P2 = T.

How do you know if it's a Difference problem?

When you compare two amounts for a difference.

Good. In Difference problems, you compare two amounts for a difference. We have talked about problems where the missing information is the difference.

What's the Difference equation?

G – L = D.

Now say the Difference equation again.

G – L = D.

How do you know if it's a Change problem?

When you have a starting amount that increases or decreases to a new amount.

Good. Change problems tell us a starting amount. Then, something happens to increase or decrease the amount we started with. What are the two Change equations?

ST + C = E and ST – C = E.

Great job! Say the two Change equations again.

ST + C = E and ST – C = E.

How do you know if it's an Equal Groups problem?

When you have groups with an equal number in each group.

Good! Equal Groups problems have groups with an equal number in each group.

What is our Equal Groups equation?

GR × N = P.

Great job! Let's say our Equal Groups equation again.

GR × N = P.

Recently we started talking about Equal Groups problems with a known product. How do you know if it's an Equal Groups problem with a known product?

In Equal Groups problems with a known product, there is a product shared equally among groups.

Exactly. When we have equal groups with a known product, we have a product shared equally among groups (gesture)**.**

We always can use our Equal Groups equation to solve Equal Groups problems with a known product. But what is another equation we can use that might be easier?

P ÷ GR = N.

Great job! Let's say that equation again.

P ÷ GR = N.

What does P (point) **stand for?**

The product.

What does GR (point) **stand for?**

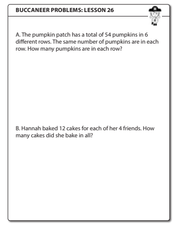
The number of groups.

What does N (point) **stand for?**

The number *in* each group.

Nice job with that review! Let's look at this problem.

Point to A.


BUCCANEER PROBLEMS: LESSON 26

A. The pumpkin patch has a total of 54 pumpkins in 6 different rows. The same number of pumpkins are in each row. How many pumpkins are in each row?

B. Hannah baked 12 cakes for each of her 4 friends. How many cakes did she bake in all?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem A:</u>

The pumpkin patch has a total of 54 pumpkins in 6 different rows. The same number of pumpkins are in each row. How many pumpkins are in each row?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 54; GR = 6; N = __*
Number Sentence:	*54 ÷ 6 = __*
Answer:	*__ = 9 pumpkins*

Follow steps on the UPS Check^2 poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product shared equally among groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Hannah baked 12 cakes for each of her 4 friends. How many cakes did she bake in all?

Problem Type:	*Equal Groups*
Relevant Information:	*GR = 4; N = 12; P = __*
Number Sentence:	*4 × 12 = __*
Answer:	*__ = 48 cakes*

Follow steps on the UPS Check² poster.
Continue to use whiteboards with painter's tape and markers to illustrate the groups and the equal number in each group as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. There is a table, but the table already is numbered so we can go ahead and follow our UPS Check² steps.

<u>*Solution to Problem C:*</u>

The table shows how much money each person spent at the coffee shop over 5 days. If Lincoln spent the same amount of money each day, how much money did he spend each day?

Problem Type:	*Equal Groups*
Relevant Information:	*P = 40; GR = 5; N = __*
Irrelevant Information:	~~*Truman, Jackson, Carter*~~
Number Sentence:	*40 ÷ 5 = __*

Answer: *__ = $8*

Follow steps on the UPS Check^2 poster.
Continue to use whiteboards with painter's tape and markers to illustrate the product and the number of groups as needed.
Continue to use Multiplication Table poster as needed.
Use the What Do You Ask Yourself? poster and gesture and question with student.

You earn a treasure coin!

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

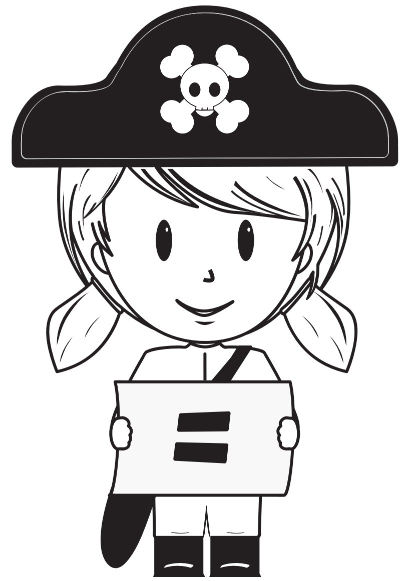
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 27

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
    Multi-step Total and Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 2

Student Materials

Equation Quest: Lesson 27
Buccaneer Problems: Lesson 27
Jolly Roger Review: Lesson 27
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on multiplication and division problems (point)**.**

We call problems with groups multiplied Equal Groups problems. We also call problems with a product divided Equal Groups problems.

Point to A.

Let's read the problem. 2 times 6 is the same as blank. Let's say that together.

2 times 6 is the same as blank.

What do we need to do?

Balance both of the sides.

What do we need to do to balance both of the sides?

Multiply 2 times 6.

Exactly. We can multiply the two numbers to make the two sides the same. What should we multiply?

2 and 6.

Yes! To balance both of the sides, let's draw pictures. If we have 2 times 6, we need to make 2 groups of 6. Let's go ahead and draw 2 groups of triangles with 6 triangles in each group. Go ahead and draw the groups and the number in each group.

(Draws.)

Guide student to draw 2 groups of triangles with 6 triangles in each group.

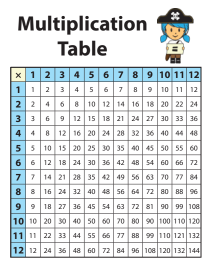
Now that we have made 2 groups of 6, let's count the triangles. How many triangles do we have?

(Counts.)

12.

Exactly! We also can use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



To check our work, we put one finger on the 2 in the left blue row (point) **and another finger on the 6 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

12.

Nice! So what is our product, or answer?

12.

Exactly! 2 times 6 is 12. What is blank the same as?

12.

(Writes.)

Let's read the number sentence together.

2 times 6 is the same as 12.

Let's try another one.

Point to B.

Let's read the problem. 15 divided by 3 is the same as blank. Let's say that together.

15 divided by 3 is the same as blank.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need share the 15 equally among 3 groups to determine how many are in each group. Let's go ahead and draw our product.

What's our product?

15.

Good! Let's draw 15 squares here (point to the left box)**.**

(Draws.)

How many groups do we need to make?

3.

Exactly! We know there are 3 groups. Let's go ahead and draw 3 big circles and let's make sure we have the same number of squares in each big circle.

Guide student to draw a big circle around each group of 5 squares.

Now, we need to find out how many squares are *in* each group of 3. Let's look. How many squares are in each big circle? How many are *in* each group?

5.

Exactly! There are 5 squares in each of the 3 big circles, which means there are 5 in each group. 15 divided by 3 is the same as 5. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we identify our divisor as 3 (point)**. Then, we find the left blue row starting with 3 and put a finger on the 3** (point)**. Then, we slide our finger over until we get to 15, our dividend. Then, we slide our finger up from the 15 to the top of the blue column** (point)**. At the top of the blue column, we see the number 5, the quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

5.

Exactly! We know our numbers are correct. 15 divided by 3 is the same as 5. What is blank the same as?

5.

(Writes.)

Let's read the number sentence together.

15 divided by 3 is the same as 5.

Let's try another one.

Point to C.

Let's read the problem. Blank is the same as 14 divided by 7. Let's say that together.

Blank is the same as 14 divided by 7.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's draw pictures. We need share the 14 equally among 7 groups to determine how many are in each group. Let's go ahead and draw our product.

What's our product?

14.

Good! Let's draw 14 squares here (point to the right box)**.**

(Draws.)

How many groups do we need to make?

7.

Exactly! We know there are 7 groups. Let's go ahead and draw 7 big circles and let's make sure we have the same number of squares in each big circle.

Guide student to draw a big circle around each group of 2 squares.

Now, we need to find out how many squares are *in* each group of 7. Let's look. How many squares are in each big circle? How many are *in* each group?

2.

Exactly! There are 2 squares in each of the 7 big circles, which means there are 2 in each group. 2 is the same as 14 divided by 7. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we identify our divisor as 7 (point)**. Then, we find the left blue row starting with 7 and put a finger on the 7** (point)**. Then, we slide our finger over until we get to 14, our dividend. Then, we slide our finger up from the 14 to the top of the blue column** (point)**. At the top of the blue column, we see the number 2, the quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

2.

Exactly! We know our numbers are correct. 2 is the same as 14 divided by 7. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

2 is the same as 14 divided by 7.

Nice work!

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your

Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. Today, we are going to talk about another type of multi-step problem. We are going to learn about multi-step problems that include the Total *and* Equal Groups schemas.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

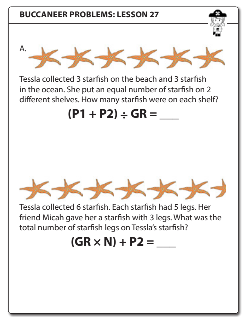
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

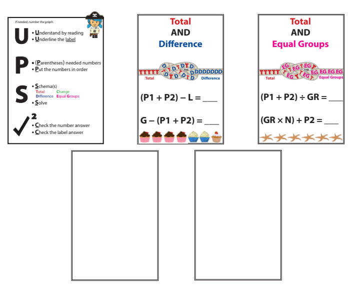
Very good.

Point to A.



Today we are going to talk about multi-step word problems that are Total *and* Equal Groups problems! We will learn about Total and Equal Groups problems where the Equal Groups have a known product. We also will learn about Total and Equal Groups problems where the Equal Groups have a missing product. Let me show you what I mean.

Display Multi-Step Word-Problem Schema Mat - Version 2.



Our program is called Pirate Math Equation Quest. Pirates use ropes like this one (point to the rope on the Total and Equal Groups poster) **on their ships to power and lift their sails.**

What do you notice about the rope on this poster?

(Responds.)

Exactly! We see the word total with T's on one side of the rope. We see the words equal groups with EG's on the other side of the rope.

What do you notice about the T's and EG's in the center of the knot?

(Responds.)

Yes! The T's and EG's are mixed together. This is to show that sometimes we have problems that are a mix of the Total and Equal Groups schemas. Let me show you what I mean. I am going to show you the two examples of multi-step problems that you are most likely to see. The first example includes the Total and Equal Group schemas where the Equal Groups have a known product. The second example includes the Total and Equal Groups schemas where the Equal Groups have a missing product. Remember, when we have a known product, we can divide. When we have a missing product, we can multiply.

Point to A.

Let's read the first problem. "Tessla collected 3 starfish on the beach and 3 starfish in the ocean. She put an equal number of starfish on 2 different shelves. How many starfish were on each shelf?"

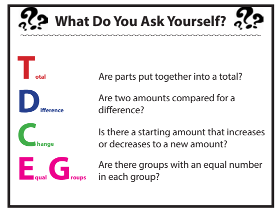
Circle 3, 3, and 2 in the story as you say the following:

This is a Total story because we are putting together or combining two parts: the starfish on the beach and the starfish in the ocean. It says, "Tessla collected 3 starfish on the beach and 3 starfish in the ocean." Tessla is collecting the starfish, which tells us we are putting two amounts together: starfish on the beach and starfish in the ocean (gesture)**.**

But this problem is not just a Total problem! Let's read our question again. It says, "How many starfish were on each shelf?"

What kind of schema do you think we have? You can use your What Do You Ask Yourself? poster to help you out.

Display What Do You Ask Yourself? poster.



(Responds.)

Good thinking! It says, "How many starfish were on each shelf?" Tessla is sharing her starfish equally among the shelves. Whenever we have a product shared equally among groups, what kind of schema do we have?

Equal Groups with a known product.

You're right! In Equal Groups problems with a known product, we have a product shared equally among groups. In this problem, we have a product: the number of starfish, shared equally among groups: the number of shelves (gesture)**.**

When we have multi-step problems that include two schemas like this one, which has the Total and Equal Groups schemas, we have new equations to help us solve the problem!

Can you read this equation aloud for me (point)**?**

(Responds.)

What do you notice about this equation (point to (P1 + P2) ÷ GR = __)**?**

(Responds.)

Wow! You really have your thinking cap on today! Nice work! Our problem is a Total problem *and* an Equal Groups problem, so our equation is a Total and Equal Groups equation combined!

We have (P1 + P2) ÷ GR = __.

What do P1 and P2 stand for?

Part 1 and part 2.

Exactly! P1 and P2 stand for part 1 and part 2, or the two amounts we are combining. In this problem, we are combining the starfish Tessla collected on the beach and the starfish Tessla collected in the ocean (gesture)**.**

And what does GR stand for?

Number of groups.

Excellent! GR is the number of groups. In this story, the number of groups is the number of different shelves. We are sharing the total number of starfish equally among 2 different shelves (gesture)**.**

Do you notice anything else that is different or new in this equation?

There are parentheses.

Nice! The parentheses (point) **are first in the order of operations. All that means is that we need to add the numbers in parentheses FIRST when we solve this problem. What do parentheses mean?**

(Student.)

Exactly! Whatever you see in parentheses, you need to do first. What do you see in parentheses in this problem?

P1 and P2.

Right! So what does that mean?

We need to add P1 and P2 before we divide GR.

Nice! You need to add P1 and P2 before you divide GR.

Now before we practice solving multi-step Total and Equal Groups problems with a known product, let's look at an example of a Total and Equal Groups problem with a missing product. This problem is similar to the problem we just read, but our equation is a little different.

Circle 6, 5, and 3 in the story as you say the following:

Let's read the second problem (point)**. "Tessla collected 6 starfish. Each starfish**

had 5 legs. Her friend Micah gave her a starfish with 3 legs. What was the total number of starfish legs on Tessla's starfish?"

What about this problem is *the same* as the first problem?

(Responds.)

Good job! Both problems are talking about starfish.

What about this problem is *different* from the first problem?

(Responds.)

Nice! In the first problem, we combined starfish on the beach and starfish in the ocean and shared the starfish equally among shelves. In this problem, Tessla collected 6 starfish that each had 5 legs and we are combining those starfish legs with the 3 starfish legs that her friend Micah gave her.

Can you read the next equation for me (point to (GR × N) + P2 = __)**?**

(Responds.)

How is this equation (point to (GR × N) + P2 = __) **different from our first equation?**

(Responds.)

Excellent! In this equation, we have GR times N, the groups times the number in each group, plus part 2.

In the first problem, we combined the amount of starfish and shared the starfish equally among shelves (gesture)**. Our first problem was a Total and Equal Groups problem where the Equal Groups had a known product.**

What was our first problem?

(Responds.)

In the second problem, we had groups with an equal number in each group. We had 6 starfish and each starfish had 5 legs (gesture)**. Then, we combined the starfish legs Tessla collected with the number of starfish legs Tessla's friend**

Micah gave to her (gesture)**. Our second problem was a Total and Equal Groups problem where the Equal Groups had a missing product.**

What was our second problem?

(Responds.)

We will talk more about the second equation and Total and Equal Groups problems where the Equal Groups have a missing product the next time we meet. Today, I just want you to see the two equations we use for multi-step Total and Equal Groups problems.

We will use the first equation (point) **when we have a multi-step problem that includes the Total and Equal Groups schemas where the Equal Groups have a known product. We will use the second equation** (point) **when we have a multi-step problem that includes the Total and Equal Groups schemas where the Equal Groups have a missing product.**

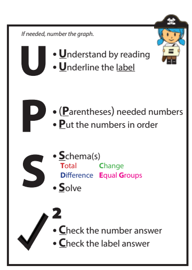
Remind me again, what do the parentheses mean?

(Responds.)

Awesome! Now, are you ready to practice solving a multi-step Total and Equal Groups problem where the Equal Groups have a known product with me?

(Responds.)

Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 2.



Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Jordan's mom had 6 cups of chocolate cereal and 6 cups of granola cereal in a box. His mom poured an equal amount of cereal into 2 different bowls. How many cups of cereal were in each bowl?

Problem Type:	*Total and Equal Groups*
Equation:	*(P1 + P2) ÷ GR = __*
Relevant Information:	*P1 = 6; P2 = 6; GR = 2*
Number Sentence:	*(6 + 6) ÷ 2 = __*
Answer:	*__ = 6 cups of cereal*

Excellent! There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "Jordan's mom had 6 cups of chocolate cereal and 6 cups of granola cereal in a box. His mom poured an equal amount of cereal into 2 different bowls. How many cups of cereal were in

each bowl?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

(Responds.)

The problem asks us about cups of cereal. Let's underline cups of cereal in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 6. 6 is about cups of chocolate cereal, so 6 is relevant. Let's put parentheses around 6 cups of

chocolate cereal.

(Writes.)

What is our next number?

6.

Our next number is 6. 6 is about cups of granola cereal, so 6 is relevant. Let's put parentheses around 6 cups of granola cereal.

(Writes.)

What is our last number?

2.

Our last number is 2. 2 is not about cups. 2 is talking about bowls. Even though bowls is different from cups, the 2 is still relevant. In this problem, Jordan's mom is pouring cups of cereal into bowls. 2 is important. Let's put parentheses around 2 different bowls.

Why do we need to put parentheses around 2 different bowls?

(Responds.)

All of the numbers in this problem are relevant because they are all about or related to our label, cups. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of

solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Because we are working multi-step problems, we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "Jordan's mom had 6 cups of chocolate cereal and 6 cups of granola cereal in a box. His mom poured an equal amount of cereal into 2 different bowls. How many cups of cereal were in each bowl?"

In this problem, we are first combining the cups of chocolate cereal and the cups of granola cereal (gesture)**. Then, we are sharing the cups of cereal equally among bowls** (gesture)**. This problem is a lot like the first starfish problem where we combined the starfish from the beach and the starfish from the ocean and shared them equally among shelves.**

If we are combining first, above which numbers should we put a 1?

Above 6 and 6.

Nice! First, Jordan's mom is combining the 6 cups of chocolate cereal with the 6 cups of granola cereal, so let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 2 different bowls.

Great! After we combine the cups of chocolate cereal and granola cereal, we need to share the cups equally among the 2 different bowls. Let's put a 2 above 2 different bowls.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about today?

Total and Equal Groups.

Exactly! We are learning about multi-step problems that include the Total and Equal Groups schemas.

We know which schemas we are working with, but we need to figure out which schema we need to use first and which schema we need to use second. What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Read the questions and gesture with student.

First, we are combining the cups of chocolate cereal and the cups of granola cereal (gesture)**. If we are combining, are we putting two parts together or sharing equally among groups?**

Putting parts together.

Nice! If we are putting parts together, are we using the Total or Equal Groups schema first?

Total.

To remind me to complete the Total step first, I write 1-T next to the problem. 1 stands for the first step of solving.

Write 1-T.

Now, we can move on to the second schema. What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we combine cups of chocolate cereal and cups of granola cereal, we share the cups equally among bowls (gesture)**. If we are sharing equally, are we using the Total or Equal Groups schema second?**

Equal Groups.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Total and Equal Groups poster.

Point to Total and Equal Groups equations on the Multi-Step Word-Problem Schema Mat - Version 2.

If we look carefully, we see that the first equation on our poster includes the Total and Equal Groups schemas where the Equal Groups have a known product (point)**. The second equation on our poster includes the Total and Equal Groups schemas where the Equal Groups have a missing product** (point)**.**

Which schemas are we using in this problem?

Total and Equal Groups with a known product.

Nice! So which equation do we need to use?

(P1 + P2) ÷ GR = ___.

You're right! Our equation is (P1 + P2) ÷ GR = ___. Let's write it!

Write (P1 + P2) ÷ GR = ___.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Total and Equal Groups equation, we can plug in our numbers.

We said our first step was to combine cups of chocolate cereal and cups of granola cereal. What numbers are talking about cups of chocolate cereal and cups of granola cereal?

6 and 6.

Great! Let's put 6 and 6 under P1 and P2.

(Writes).

Check off 6 and write 6 underneath P1.
Check off 6 and write 6 underneath P2.

After we check off our numbers, we also can put a checkmark next to the 1-T as a reminder that we already have completed the Total step.

Check off 1-T.

Now we need to find GR. We said our second step was to share the cups of cereal equally among different bowls. What number is talking about bowls?

2.

Great! Let's put 2 under GR because the 2 different bowls are the number of groups.

(Writes).

Check off 2 and write 2 underneath GR.

After we check off the 2, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the Equal Groups step.

Check off 2-EG.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

6 + 6.

What's 6 + 6?

12.

Nice! Let's write 12 under 6 + 6 and bring down the divided by 2.

(Writes.)

What do we need to do next to make both sides the same?

12 ÷ 2.

What's 12 ÷ 2?

6.

Yes. (6 + 6) ÷ 2 is the same as 6. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 6.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 6 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Cups of cereal.

We underlined cups of cereal, right here (point)**. We used the words cups of cereal for our label. So, we write cups of cereal after the number 6.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Jordan's mom had 6 cups of chocolate cereal and 6 cups of granola cereal in a box. His mom

poured an equal amount of cereal into 2 different bowls. How many cups of cereal were in each bowl?"

Did we answer the question, "How many cups of cereal were in each bowl?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is cups of cereal.

What words did we underline in our question sentence?

Cups of cereal.

Exactly. We underlined cups of cereal. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Total and Equal Groups problem! Let's try one more.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

> *A construction company earned $20 for one job and $70 for a second job. The money was divided equally among the 3 workers. How much did each worker receive?*

Problem Type:	*Total and Equal Groups*
Equation:	*(P1 + P2) ÷ GR = __*
Relevant Information:	*P1 = 20; P2 = 70; GR = 3*
Number Sentence:	*(20 + 70) ÷ 3 = __*
Answer:	*__ = $30*

Follow the step-by-step dialogue for Problem B.
Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

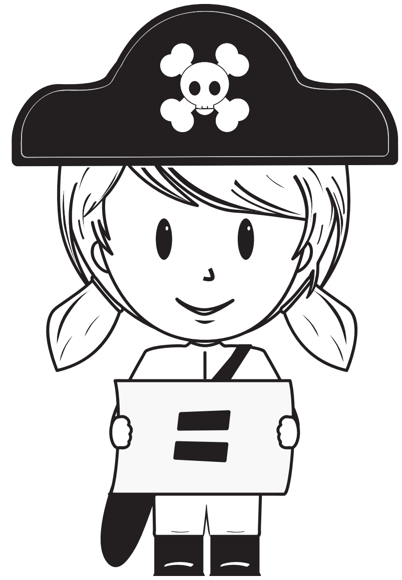
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 28



ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Total and Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review

Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 2

Student Materials

Equation Quest: Lesson 28
Buccaneer Problems: Lesson 28
Jolly Roger Review: Lesson 28
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on addition, subtraction, multiplication, and division problems (point)**.**

Point to A.

Let's read the problem. 18 divided by blank is the same as 6. Let's say that together.

18 divided by blank is the same as 6.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. We need to find out how many groups we can make from 18 when we share the 18 equally among groups. We need to have 6 in each group. Let's go ahead and count out our product.

What's our product?

18.

Good! Let's count 18 cubes.

(Counts.)

How many groups do we need to make?

We don't know.

Exactly! We don't know the number of groups. That is what we are trying to find out.

How many need to be *in* each group?

6.

Exactly! Let's go ahead and divide the 18 cubes by putting 6 cubes in each group.

(Divides.)

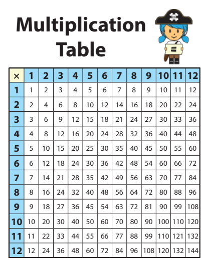
Guide student to divide the 18 cubes into 3 groups with 6 cubes in each group.

How many groups did you make?

3.

Exactly! You made 3 groups of cubes, which means that there are 3 groups. 18 divided by 3 is the same as 6. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.


Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we identify our divisor as 3 (point)**. Then, we find the left blue row starting with 3 and put a finger on the 3** (point)**. Then, we slide our finger over until we get to 18, our dividend. Then, we slide our finger up from the 18 to the top of the blue column** (point)**. At the top of the blue column, we see the number 6, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

6.

Exactly! We know our numbers are correct. 18 divided by 3 is the same as 6. What is blank the same as?

3.

(Writes.)

Let's read the number sentence together.

18 divided by 3 is the same as 6.

Let's try another one.

Point to B.

Let's read the problem. 11 times 2 is the same as blank. Let's say that together.

11 times 2 is the same as blank.

What do we need to do to balance both of the sides?

Multiply 11 times 2.

Exactly. We can multiply the two numbers to make the two sides the same. What should we multiply?

11 and 2.

Yes! Let's use cubes to solve this problem. If we have 11 times 2, we need to make 11 groups of 2 with the cubes. Go ahead and make the groups with the cubes.

(Makes 11 groups of 2.)

Now that we have made 11 groups of 2, let's count the cubes. How many cubes do we have?

(Counts.)

22.

Exactly! We also can use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 11 in the left blue row (point) **and another finger on the 2 in the top blue column** (point)**. Then, we slide our two**

fingers together and find the box where they meet (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

22.

Nice! So what is our product, or answer?

22.

Exactly! 11 times 2 is 22. What is blank the same as?

22.

(Writes.)

Let's read the number sentence together.

11 times 2 is the same as 22.

Let's try another one.

Point to C.

This problem says 7 plus blank is the same as 16. Let's read that together.

7 plus blank is the same as 16.

To solve this problem, all we need to do is make the sides the same.

To solve this problem with cubes, let's place 7 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Now, place 16 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 16 cubes on this side of the equal sign (point)**, and 16 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

9.

That's right. You added 9 cubes. So, 7 plus 9 is the same as 16. Go ahead and write 9.

(Writes.)

Let's read the number sentence together.

7 plus 9 is the same as 16.

Let's try one more.

Point to D.

This problem says 5 is the same as 13 minus blank. Let's read that together.

5 is the same as 13 minus blank.

To solve this problem with cubes, place 5 cubes on this side of the equal sign (point)**.**

(Places cubes.)

Now, on that side (point)**, place 13 cubes.**

(Places cubes.)

Are the two sides the same?

No.

Exactly! We have 5 cubes on this side of the equal sign (point) **and 13 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 13 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

8.

So, 5 is the same as 13 minus 8. So, blank is the same as what?

8.

Yes, 5 is the same as 13 minus 8.

Nice work!

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. Yesterday we talked about multi-step problems that include the Total *and* Equal Groups schemas.

Today we are going to continue to practice solving problems that include the Total *and* Equal Groups schemas.

Let's review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

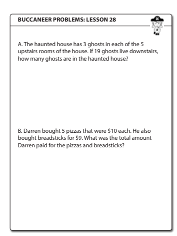
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.



BUCCANEER PROBLEMS: LESSON 28

A. The haunted house has 3 ghosts in each of the 5 upstairs rooms of the house. If 19 ghosts live downstairs, how many ghosts are in the haunted house?

B. Darren bought 5 pizzas that were $10 each. He also bought breadsticks for $9. What was the total amount Darren paid for the pizzas and breadsticks?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

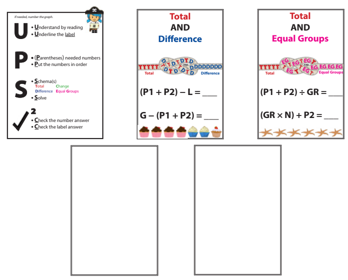
Number it.

<u>*Solution to Problem A:*</u>

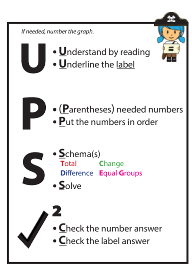
The haunted house has 3 ghosts in each of the 5 upstairs rooms of the house. If 19 ghosts live downstairs, how many ghosts are in the haunted house?

Problem Type: *Total and Equal Groups*
Equation: $(GR \times N) + P2 = \_\_$
Relevant Information: $GR = 5; N = 3; P2 = 19$
Number Sentence: $(5 \times 3) + 19 = \_\_$
Answer: $\_\_ = 34$ *ghosts*

Display Multi-Step Word-Problem Schema Mat - Version 2.



Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 2.



There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "The haunted house has 3 ghosts in each of the 5 upstairs rooms of the house. If 19 ghosts live downstairs, how many ghosts are in the haunted house?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

Ghosts.

Great! Our label is ghosts. Let's underline ghosts in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 3. 3 is about ghosts, so 3 is relevant. Let's put parentheses around 3 ghosts.

(Writes.)

What is our next number?

5.

Our next number is 5. 5 is about the upstairs rooms. Even though 5 isn't talking about ghosts, the ghosts are located in each of the 5 upstairs rooms, so 5 is relevant. Let's put parentheses around 5 upstairs rooms.

(Writes.)

What is our last number?

19.

Our last number is 19. 19 is about ghosts, so 19 is relevant. Let's put parentheses around 19 ghosts.

All of the numbers in this problem are relevant because they are all about our label, ghosts.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the

problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Because we are working multi-step problems, we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "If 19 ghosts live downstairs, how many ghosts are in the haunted house?"

In this problem, we are first making groups with an equal number in each group (gesture)**. Then, we are putting parts together for a total** (gesture)**.**

If we are making groups with an equal number in each group, above which numbers should we put a 1?

Above 3 and 5.

Nice! First, we need to figure out how many ghosts are upstairs. There are 3 ghosts in each of the 5 upstairs rooms, so we need to make groups with an equal number in each group. Let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 19.

Great! After we make groups with an equal number in each group to determine the number of ghosts upstairs, we need to combine the number of ghosts upstairs with the number of ghosts downstairs. Let's put a 2 above 19 ghosts.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about?

Total and Equal Groups.

Exactly! Recently, we have been talking about multi-step problems that include the Total and Equal Groups schemas!

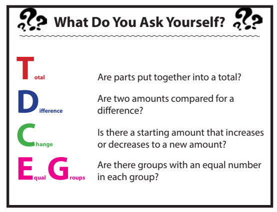
We need to figure out if we are using the Total and Equal Groups schemas where the Equal Groups have a known product or the Total and Equal Groups schemas where the Equal Groups have a missing product. We also need to figure out which schema we need to use first and which schema we need to use second.

What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Display What Do You Ask Yourself? poster.



Read the questions and gesture with student.

First, we need to find the number of ghosts in the upstairs rooms. There are 3 ghosts in each of the 5 upstairs rooms, so we need to make groups with an equal number in each group to find the total number of ghosts in the upstairs rooms (gesture)**. If we are making groups with an equal number in each group, which schema are we using?**

Equal Groups.

Nice! To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema.

What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster again to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we make groups with an equal number in each group, we need to combine the number of ghosts upstairs and the number of ghosts downstairs (gesture)**. If we are combining two parts, which schema are we using second?**

Total.

Nice! To remind me to complete the Total step second, I write 2-T next to the problem. 2 stands for the second step of solving.

Write 2-T.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Total and Equal Groups poster.

Point to Total and Equal Groups equations on the Multi-Step Word-Problem Schema Mat - Version 2.

Let's look at our poster.

What's the first equation (point)**?**

(Responds.)

The first equation (point) **is (P1 + P2) ÷ GR. This equation includes the Total and Equal Groups schemas where the Equal Groups have a known product.**
What's the second equation (point)**?**

(Responds.)

The second equation (point) **is (GR × N) + P2. This equation includes the Total and Equal Groups schemas where the Equal Groups have a missing product.**

Which equation do we need to use?

(Responds.)

You're right! We need to use the second equation.

How do you know?

Our problem includes the Total and Equal Groups schemas with a missing product.

Guide student as needed.

You're right! Let's use our second equation. What's our second equation?

Our second equation is (GR × N) + P2 = ___.

Good! Let's write it!

Write (GR × N) + P2 = ___.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Total and Equal Groups equation, we can plug in our numbers.

We said our first step was to make groups with an equal number in each group. We need to find the total number of ghosts upstairs. What numbers are talking about the ghosts in the upstairs rooms?

5 and 3.

Great! Let's put 5 and 3 under GR and N.

(Writes).

Check off 5 and write 5 underneath GR.
Check off 3 and write 3 underneath N.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the Equal Groups step.

Check off 1-EG.

Now we need to find P2. We said our second step was to combine the number of ghosts upstairs with the number of ghosts downstairs. What number is talking about the number of ghosts downstairs?

19.

Great! Let's put 19 under P2 because it's the second part.

(Writes).

Check off 19 and write 19 underneath P2.

After we check off the 19, we also can put a checkmark next to the 2-T as a reminder that we already have completed the Total step.

Check off 2-T.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

5×3.

What's 5×3?

15.

Nice! Let's write 15 under 5×3 and bring down the plus 19.

(Writes.)

What do we need to do next to make both sides the same?

$15 + 19$.

What's $15 + 19$?

34.

Yes. $(5 \times 3) + 19$ is the same as 34. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 34.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 34 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Ghosts.

We underlined ghosts, right here (point)**. We used the word ghosts for our label. So, we write ghosts after the number 34.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "The haunted house has 3 ghosts in each of the 5 upstairs rooms of the house. If 19 ghosts live downstairs, how many ghosts are in the haunted house?"

Did we answer the question, "If 19 ghosts live downstairs, how many ghosts are in the haunted house?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is ghosts.

What word did we underline in our question sentence?

Ghosts.

Exactly. We underlined ghosts. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Total and Equal Groups problem! Let's try another.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Darren bought 5 pizzas that were $10 each. He also bought breadsticks for $9.
What was the total amount Darren paid for the pizza and breadsticks?
Problem Type: Total and Equal Groups

Equation:	$(GR \times N) + P2 = \_\_$
Relevant Information:	$GR = 5; N = 10; P2 = 9$
Number Sentence:	$(5 \times 10) + 9 = \_\_$
Answer:	$\_\_ = \$59$

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

Valentina arranged 2 boxes of mirrors on her store shelves. Each box contained 11 mirrors. She also arranged 5 additional mirrors on the shelves. How many mirrors did Valentina arrange?

Problem Type:	*Total and Equal Groups*
Equation:	$(GR \times N) + P2 = \_\_$
Relevant Information:	$GR = 2; N = 11; P2 = 5$
Number Sentence:	$(2 \times 11) + 5 = \_\_$
Answer:	$\_\_ = 27$ *mirrors*

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

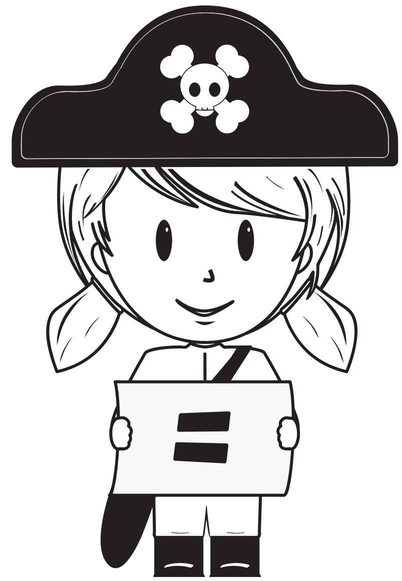
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 29

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 2
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 29
Buccaneer Problems: Lesson 29
Jolly Roger Review: Lesson 29
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on addition, subtraction, multiplication, and division problems (point)**.**

Point to A.

Let's read the problem. 8 times 2 is the same as blank. Let's say that together.

8 times 2 is the same as blank.

What do we need to do to balance both of the sides?

Multiply 8 times 2.

Exactly. We can multiply the two numbers to make the two sides the same. What should we multiply?

8 and 2.

Yes! Let's use cubes to solve this problem. If we have 8 times 2, we need to make 8 groups of 2 with the cubes. Go ahead and make the groups with the cubes.

(Makes 8 groups of 2.)

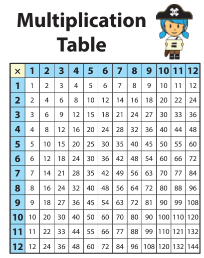
Now that we have made 8 groups of 2, let's count the cubes. How many cubes do we have?

(Counts.)

16.

Exactly! We also can use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



To check our work, we put one finger on the 8 in the left blue row (point) **and another finger on the 2 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

16.

Nice! So what is our product, or answer?

16.

Exactly! 8 times 2 is 16. What is blank the same as?

16.

(Writes.)

Let's read the number sentence together.

8 times 2 is the same as 16.

Let's try another one.

Point to B.

Let's read the problem. 12 divided by blank is the same as 4. Let's say that together.

12 divided by blank is the same as 4.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. We need to find out how many groups we can make from 12 when we share the 12 equally among groups. We need to have 4 in each group. Let's go ahead and count out our product.

What's our product?

12.

Good! Let's count 12 cubes.

(Counts.)

How many groups do we need to make?

We don't know.

Exactly! We don't know the number of groups. That is what we are trying to find out.

How many need to be *in* each group?

4.

Exactly! Let's go ahead and divide the 12 cubes by putting 4 cubes in each group.

(Divides.)

Guide student to divide the 12 cubes into 3 groups with 4 cubes in each group.

How many groups did you make?

3.

Exactly! You made 3 groups of cubes, which means that there are 3 groups. 12 divided by 3 is the same as 4. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we identify our divisor as 3 (point)**. Then, we find the left blue row starting with 3 and put a finger on the 3** (point)**. Then, we slide our finger over until we get to 12, our dividend. Then, we slide our finger up from the 12 to the top of the blue column** (point)**. At the top of the blue column, we see the number 4, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

4.

Exactly! We know our numbers are correct. 12 divided by 3 is the same as 4. What is blank the same as?

3.

(Writes.)

Let's read the number sentence together.

12 divided by 3 is the same as 4.

Point to C.

This problem says 4 is the same as 13 minus blank. Let's read that together.

4 is the same as 13 minus blank.

To solve this problem with cubes, place 4 cubes on this side of the equal sign (point)**.**

(Places cubes.)

Now, on that side (point)**, place 13 cubes.**

(Places cubes.)

Are the two sides the same?

No.

Exactly! We have 4 cubes on this side of the equal sign (point) **and 13 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 13 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

9.

So, 4 is the same as 13 minus 9. So, blank is the same as what?

9.

Yes, 4 is the same as 13 minus 9.

Nice work! Let's try one more.

Point to D.

This problem says 5 plus blank is the same as 14. Let's read that together.

5 plus blank is the same as 14.

To solve this problem, all we need to do is make the sides the same.

To solve this problem with cubes, let's place 5 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Now, place 14 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 14 cubes on this side of the equal sign (point)**, and 14 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

9.

That's right. You added 9 cubes. So, 5 plus 9 is the same as 14. Go ahead and write 9.

(Writes.)

Let's read the number sentence together.

5 plus 9 is the same as 14.

Nice work!

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference

schemas. Yesterday we talked about multi-step problems that include the Total *and* Equal Groups schemas.

Today we are going to continue to practice solving problems that include the Total *and* Equal Groups schemas.

Let's review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

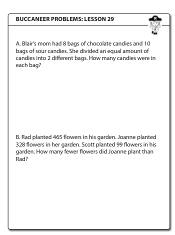
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 29

A. Blair's mom had 8 bags of chocolate candies and 10 bags of sour candies. She divided an equal amount of candies into 2 different bags. How many candies were in each bag?

B. Rad planted 465 flowers in his garden. Joanne planted 328 flowers in her garden. Scott planted 99 flowers in his garden. How many fewer flowers did Joanne plant than Rad?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem A:

Blair's mom had 8 bags of chocolate candies and 10 bags of sour candies. She divided an equal amount of candies into 2 different bags. How many candies were in each bag?

Problem Type:	*Total and Equal Groups*
Equation:	*(P1 + P2) ÷ GR = __*
Relevant Information:	*P1 = 8; P2 = 10; GR = 2*
Number Sentence:	*(8 + 10) ÷ 2 = __*
Answer:	*__ = 9 candies*

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Rad planted 465 flowers in his garden. Joanne planted 328 flowers in her garden. Scott planted 99 flowers in his garden. How many fewer flowers did Joanne plant than Rad?

Problem Type:	*Difference*
Equation:	*G – L = __*
Relevant Information:	*G = 465; L = 328; D = __*
Irrelevant Information:	~~*Scott planted 99 flowers in his garden.*~~
Number Sentence:	*465 – 328 = __*
Answer:	*__ = 137 (fewer) flowers*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Maria sold 66 tulips and 25 daisies at her flower shop. She also sold 12 roses. How many more tulips and daisies did Maria sell than roses?

Problem Type:	*Total and Difference*
Equation:	*(P1 + P2) – L = __*
Relevant Information:	*P1 = 66; P2 = 25; L = 12*
Number Sentence:	*(66 + 25) – 12 = __*
Answer:	*__ = 79 (more) tulips and daisies*

Remind students that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2) – L = __.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

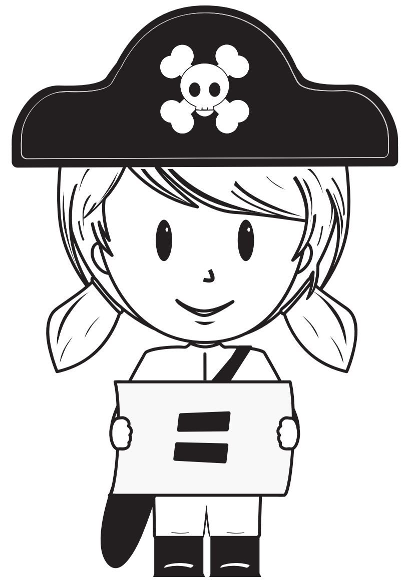
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 30

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Equal Groups and Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 30
Buccaneer Problems: Lesson 30
Jolly Roger Review: Lesson 30
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Point to A.

This problem says 14 is the same as blank plus 6. Let's read that together.

14 is the same as blank plus 6.

To solve this problem, all we need to do is make the sides the same.

To solve this problem with cubes, let's place 14 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Now, place 6 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 14 cubes on this side of the equal sign (point)**, and 14 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

8.

That's right. You added 8 cubes. So, 14 is the same as 8 plus 6. Go ahead and write 8.

(Writes.)

Let's read the number sentence together.

14 is the same as 8 plus 6.

Let's try another one.

Point to B.

Let's read the problem. 6 divided by blank is the same as 3. Let's say that together.

6 divided by blank is the same as 3.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. We need to find out how many groups we can make from 6 when we share the 6 equally among groups. We need to have 3 in each group. Let's go ahead and count out our product.

What's our product?

6.

Good! Let's count 6 cubes.

(Counts.)

How many groups do we need to make?

We don't know.

Exactly! We don't know the number of groups. That is what we are trying to find out.

How many need to be *in* each group?

3.

Exactly! Let's go ahead and divide the 6 cubes by putting 3 cubes in each group.

(Divides.)

Guide student to divide the 6 cubes into 2 groups with 3 cubes in each group.

How many groups did you make?

2.

Exactly! You made 2 groups of cubes, which means that there are 2 groups. 6 divided by 2 is the same as 3. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

Multiplication Table

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

To check our work, we identify our divisor as 2 (point)**. Then, we find the left blue row starting with 2 and put a finger on the 2** (point)**. Then, we slide our finger over until we get to 6, our dividend. Then, we slide our finger up from the 6 to the top of the blue column** (point)**. At the top of the blue column, we see the number 3, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

3.

Exactly! We know our numbers are correct. 6 divided by 2 is the same as 3. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

6 divided by 2 is the same as 3.

Let's try another one.

Point to C.

Let's read the problem. 14 is the same as 7 times blank. Let's say that together.

14 is the same as 7 times blank.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. Our product is 14 (point)**. We have 7 groups** (point) **and we need to figure out the equal number in each group. We need to make 7 equal groups until we get to 14. Then we need to see how many are in each group. Let's go ahead and make 7 groups until we get to 14.**

(Makes groups.)

Monitor as student makes 7 groups of 2.

How many cubes are in each of the 7 groups?

2.

Exactly! You made 7 groups with 2 in each group. So, 14 is the same as 7 times what?

2.

Exactly! 14 is the same as 7 times 2. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 7 in the left blue row (point) **and another finger on the 2 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number in the box where the two factors meet is our product** (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

14.

Nice! Our fingers met at 14, so we know our factors are correct. 14 is the same as 7 times 2. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

14 is the same as 7 times 2.

Let's try one more.

Point to D.

14 minus blank is *the same as* 9.

To solve this problem with cubes, we can place 14 cubes (place 14 cubes of one color) **on this side of the equal sign.**

Place 14 cubes.

How many cubes do we need to place on this side (point)**?**

9.

Yes! Let's place 9 cubes (place 9 cubes of one color) **on this side of the equal sign.**

Place 9 cubes.

Are the two sides the same?

No.

Exactly! We have 14 cubes on this side of the equal sign (point) **and 9 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 14 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

5.

So, 14 cubes minus blank is *the same as* 9. So, blank is the same as what?

5.

Yes, 14 minus 5 is *the same as* 9.

(Writes.)

Let's read the number sentence together.

14 minus 5 is the same as 9.

Remind me, what does the equal sign mean?

The same as.

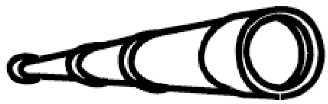
What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

 3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas.

Today, we are going to talk about another type of multi-step problem. We are going to learn about multi-step problems that include the Equal Groups *and* Equal Groups schemas.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

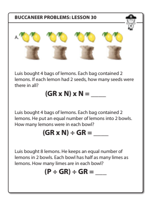
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 30

A.

Luis bought 4 bags of lemons. Each bag contained 2 lemons. If each lemon had 2 seeds, how many seeds were there in all?

(GR x N) x N = _____

Luis bought 4 bags of lemons. Each bag contained 2 lemons. He put an equal number of lemons into 2 bowls. How many lemons were in each bowl?

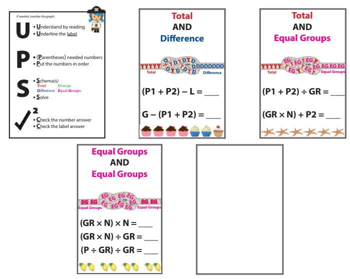
(GR x N) ÷ GR = _____

Luis bought 8 lemons. He keeps an equal number of lemons in 2 bowls. Each bowl has half as many limes as lemons. How many limes are in each bowl?

(P ÷ GR) ÷ GR = ____

Today we are going to talk about multi-step word problems that are Equal Groups *and* Equal Groups problems. We have problems that include the Equal Groups schema two times! Sometimes we have Equal Groups problems where there is a missing product two times. Sometimes we have Equal Groups problems where there is a missing product and then a known product. And we have other problems where we have Equal Groups problems where the product is known two times. Let me show you what I mean.

Display Multi-Step Word-Problem Schema Mat - Version 3.



Our program is called Pirate Math Equation Quest. Pirates use ropes like this one (point to the rope on the Equal Groups and Equal Groups poster) **on their ships to power and lift their sails.**

What do you notice about the rope on this poster?

(Responds.)

Exactly! We see the words equal groups with EG's on one side of the rope. We see the words equal groups with EG's on the other side of the rope, too.

What do you notice about the EG's and EG's in the center of the knot?

(Responds.)

Yes! The EG's and EG's are mixed together. This is to show that sometimes we have problems that use the Equal Groups schema two times. Let me show you what I mean. I am going to show you the three examples of multi-step problems that use the Equal Groups schema two times that you are most likely to see. The first example includes the Equal Groups schema where there is a missing product two times. The second example includes the Equal Groups schema where there is a missing product and then a known product. The third example includes the Equal Groups schema where there is a known product two times.

Point to A.

Let's read the first problem. "Luis bought 4 bags of lemons. Each bag contained 2 lemons. If each lemon had 2 seeds, how many seeds were there in all?"

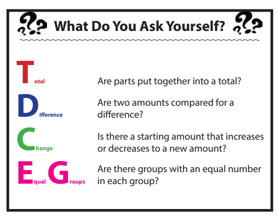
Circle 4, 2, and 2 in the story as you say the following:

This is an Equal Groups story because we have groups with an equal number in each group. The groups are the bags of lemons and the number in each group is the number of lemons in each bag. It says, "Luis bought 4 bags of lemons. Each bag contained 2 lemons." Luis has bags of lemons with an equal number of lemons in each bag, so we know we have an Equal Groups problem with a missing product (gesture)**. We need to find the total number of lemons in the 4 bags.**

But this problem is not just a single-step Equal Groups problem! There's a second schema! Let's read our question again. It says, "If each lemon had 2 seeds, how many seeds were there in all?"

What kind of schema do you think we have second? You can use your What Do You Ask Yourself? poster to help you out.

Display What Do You Ask Yourself? poster.



(Responds.)

Good thinking! It says, "If each lemon had 2 seeds, how many seeds were there in all?" We have lemons and each lemon has the same number of seeds (gesture)**. Whenever we have groups with an equal number in each group, what kind of schema do we have?**

Equal Groups with a missing product.

You're right! In Equal Groups problems, we have groups with an equal number in each group. Our product is missing. In this problem, we also have groups: the lemons, with an equal number in each group: the number of seeds in each lemon (gesture)**. We need to find the total number of seeds. Our product is missing again!**

When we have multi-step problems that include two schemas like this one,

which has the Equal Groups schema with a missing product two times, we have new equations to help us solve the problem!

Can you read this equation aloud for me (point)**?**

(Responds.)

What do you notice about this equation (point to (GR × N) × N = __)**?**

(Responds.)

Wow! You really have your thinking cap on today! Nice work! Our problem is an Equal Groups problem, but we use the Equal Groups schema with a missing product two times! Our equation is two Equal Groups equations with a missing product combined!

We have (GR × N) × N = __.

What do GR and N stand for?

The number of groups and the number in each group.

Exactly! GR stands for the groups and N stands for the number in each group. In this problem, we have groups: the bags of lemons, and an equal number in each group: the lemons in each bag (gesture)**.**

And what does N stand for again?

Number in each group.

Excellent! N stands for the number in each group. In this story, we have a second Equal Groups schema. We have groups: the lemons, and an equal number in each group: the seeds in each lemon. So we have a second example of groups with an equal number in each group (gesture)**.**

Do you notice anything else that is different or new in this equation?

There are parentheses.

Nice! The parentheses (point) **are first in the order of operations. All that means is that we need to multiply the numbers in parentheses FIRST when we solve**

this problem. What do parentheses mean?

(Student.)

Exactly! Whatever you see in parentheses, you need to do first. What do you see in parentheses in this problem?

GR and N.

Right! So what does that mean?

We need to multiply GR times N before we multiply the second N.

Nice! You need to multiply GR times N before you multiply the second N.

Now before we practice solving multi-step problems that use the Equal Groups schema with a missing product two times, let's look at an example of a multi-step problem that uses the Equal Groups schema where there is a missing product and then a known product. Let's also look at an example of a multi-step problem that uses the Equal Groups schema where the product is known two times. Let me show you what I mean.

Circle 4, 2, and 2 in the story as you say the following:

Let's read the second problem (point)**. "Luis bought 4 bags of lemons. Each bag contained 2 lemons. He put an equal number of lemons into 2 bowls. How many lemons were in each bowl?"**

What about this problem is *the same* as the first problem?

(Responds.)

Good job! Both problems are talking about lemons and both problems have the same numbers.

What about this problem is *different* from the first problem?

(Responds.)

Nice! In the first problem, Luis had bags of lemons with an equal number of lemons in each bag. Luis also had lemons with an equal number of seeds in

each lemon. The product was missing both times. In this problem, Luis had bags of lemons with an equal number of lemons in each bag. The product was missing first. Then, he shared the lemons equally among two bowls (gesture)**. Next, the product was known.**

Can you read this equation aloud for me (point)**?**

(Responds.)

How is this equation (point to (GR × N) ÷ GR = __) **different from our first equation?**

(Responds.)

Excellent! In this equation, we have GR times N, the groups times the number in each group, divided by GR, the number of groups. In this equation, we have Equal Groups with a missing product and then Equal Groups with a known product.

In the first problem, Luis had bags of lemons with an equal number of lemons in each bag. Luis also had lemons with an equal number of seeds in each lemon (gesture)**. Our first problem used the Equal Groups schema with a missing product two times.**

In the second problem, Luis had bags of lemons with an equal number of lemons in each bag (gesture)**. If he had bags of lemons with an equal number of lemons in each bag, what schema are we using? Look at the What Do You Ask Yourself? poster if you need some help.**

Equal Groups with a missing product.

Nice! The first schema is Equal Groups with a missing product. Now let's look at the next part of the problem. It says he shared the lemons equally among two bowls (gesture)**. If we are sharing a product: the lemons, equally among groups: the bowls, what schema are we using? Look at the What Do You Ask Yourself? poster if you need some help.**

Equal Groups with a known product.

Nice job! Our second problem uses the Equal Groups schema with a missing product and then the Equal Groups schema with a known product.

Let's look at one more problem.

Circle 8, 2, and half in the story as you say the following:

Let's read the third problem (point)**. "Luis bought 8 lemons. He keeps an equal number of lemons in 2 bowls. Each bowl has half as many limes as lemons. How many limes are in each bowl?"**

What about this problem is *the same* as the first and second problems?

(Responds.)

Good job! All three problems are talking about lemons.

What about this problem is *different* from the first and second problems?

(Responds.)

Nice! In the first problem, Luis had bags of lemons with an equal number of lemons in each bag. Luis also had lemons with an equal number of seeds in each lemon (gesture)**. Our first problem used the Equal Groups schema with a missing product two times.**

In the second problem, Luis had bags of lemons with an equal number of lemons in each bag. Then, he shared the lemons equally among two bowls (gesture)**. Our second problem used the Equal Groups schema with a missing product and then the Equal Groups schema with a known product.**

In this problem, Luis bought 8 lemons and shared them equally among 2 bowls. Then, each bowl had half as many limes as lemons. The word *half* looks tricky, but half just means that we are sharing or dividing something in 2. Think about a piece of fruit like an apple. If you cut an apple in *half,* the apple is shared or divided in 2.

Can you read the equation aloud for me (point)**?**

(Responds.)

How is this equation (point to (P ÷ GR) ÷ GR = __) **different from our first and second equations?**

(Responds.)

Excellent! In this equation, we have P divided by GR, the product divided by the number of groups, divided by the number of groups.

In this problem, we are sharing 8 lemons equally among 2 bowls. We have an Equal Groups schema with a known product. Then, we have half as many limes as lemons, which means we are sharing or dividing in 2. What schemas do you think we are using? Look at the What Do You Ask Yourself? poster if you need some help.

Equal Groups with a known product two times!

Nice job! Our third problem uses the Equal Groups schema with a known product two times! We will talk more about the second and third equations the next few times we meet. Today, I just want you to see the three equations we use for multi-step Equal Groups and Equal Groups problems.

We will use the first equation (point) **when we have a multi-step problem that includes the Equal Groups schema with a missing product two times. We will use the second equation** (point) **when we have a multi-step problem that includes the Equal Groups schema with a missing product and then the Equal Groups schema with a known product. We will use the third equation** (point) **when we have a multi-step problem that includes the Equal Groups schema with a known product two times.**

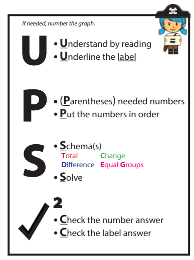
Remind me again, what do the parentheses mean?

(Responds.)

Awesome! Now, are you ready to practice solving a multi-step problem where we use the Equal Groups schema with a missing product two times?

(Responds.)

Point to UPS Check^2 poster on the Multi-Step Word-Problem Schema Mat - Version 3.



Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

Alexa drank 3 glasses of water every day for 3 days. Each glass contained 12 fl oz of water. What is the total amount of water in fluid ounces that Alexa drank?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(GR \times N) \times N = \_\_$
Relevant Information:	$GR = 3; N = 3; N = 12$
Number Sentence:	$(3 \times 3) \times 12 = \_\_$
Answer:	*__ = 108 fluid ounces of water*

Excellent! There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "Alexa drank 3 glasses of water every day for 3 days. Each glass contained 12 fl oz of water. What is the total amount of water in fluid ounces that Alexa drank?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

(Responds.)

The problem asks us about fluid ounces of water. Let's underline fluid ounces in our question sentence. Now, put your finger on 12 fl oz (point)**. Fl oz is an abbreviation that stands for fluid ounces.**

What does fl oz mean?

(Responds.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check² poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 3. 3 is about glasses of water and our label is fluid ounces of water, so 3 is relevant. Let's put parentheses around 3 glasses of water.

(Writes.)

What is our next number?

3.

Our next number is 3. 3 is about days. Even though days is different from fluid ounces of water, the question is asking us to find out how much water Alexa drank over 3 days, so 3 is relevant. Let's put parentheses around 3 days.

(Writes.)

What is our last number?

12.

Our last number is 12. 12 is about fl oz of water, so 12 is relevant. Let's put parentheses around 12 fl oz of water.

All of the numbers in this problem are relevant because they are all about or related to our label, fluid ounces of water. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that

step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Because we are working multi-step problems, we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "Alexa drank 3 glasses of water every day for 3 days. Each glass contained 12 fl oz of water. What is the total amount of water in fluid ounces that Alexa drank?"

In this problem, we have groups: the days, and an equal number in each group: the glasses of water (gesture)**. Then, we have groups: the glasses of water, and an equal number in each group: the fluid ounces of water** (gesture)**. This problem is a lot like the first lemon problem where we had groups with an equal number in each group and then we had groups with an equal number in each group again.**

First, we have groups: the days, and an equal number in each group: the glasses of water. Above which numbers should we put a 1?

Above 3 and 3.

Nice! First, Alexa drank 3 glasses of water every day for 3 days. We want to find out how many glasses of water she drank over 3 days, so let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 12 fl oz of water.

Great! After we find out how many glasses of water Alexa drank over 3 days, we need to find out how many fluid ounces are in the glasses of water.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about today?

Equal Groups and Equal Groups.

Exactly! We are learning about multi-step problems that include the Equal Groups and Equal Groups schemas.

We know which schemas we are working with, but we need to figure out if this problem uses the Equal Groups schema with a missing product two times, the Equal Groups schema with a missing product and then the Equal Groups schema with a known product, or the Equal Groups schema with a known product two times. Also, we need to figure out which schema we need to use first and which schema we need to use second. What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Read the questions and gesture with student.

First, Alexa drank 3 glasses of water every day for 3 days. We have groups: the days, and the number in each group: the glasses of water (gesture)**. If we have groups with an equal number in each group, which schema are we using?**

Equal Groups with a missing product.

To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema. What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we find out the number of glasses of water Alexa drank over 3 days, we need to find out how many fluid ounces of water she drank over 3 days. We have groups: the number of glasses of water, with an equal number in each group: the number of fluid ounces of water in each glass (gesture)**. If we have groups with an equal number in each group, which schema do we need to use second?**

Equal Groups with a missing product again.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Equal Groups and Equal Groups poster.

Point to Equal Groups and Equal Groups equations on the Multi-Step Word-Problem Schema Mat - Version 3.

If we look carefully, we see that the first equation on our poster includes the Equal Groups schemas with a missing product two times (point)**. The second equation on our poster includes the Equal Groups schema with a missing product and then the Equal Groups schema with a known product** (point)**. The third equation on our poster includes the Equal Groups schemas with a known product two times** (point)**.**

Which schemas are we using in this problem?

We are using the Equal Groups schema with a missing product two times.

Nice! So which equation do we need to use?

$(GR \times N) \times N =$ ___.

You're right! What's our equation again?

Our equation is $(GR \times N) \times N =$ ___.

Good! Let's write it!

Write (GR × N) × N = ___.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Equal Groups and Equal Groups equation, we can plug in our numbers.

We said our first step was to figure out how many glasses of water Alexa drank over 3 days. What numbers are talking about glasses of water and days?

3 and 3.

Great! Let's put 3 and 3 under GR and the first N.

(Writes).

Check off 3 and write 3 underneath GR.
Check off 3 and write 3 underneath the first N.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the first Equal Groups step.

Check off 1-EG.

Now we need to find the second N. We said our second step was to figure out the total fluid ounces of water Alexa drank over the 3 days. What number is talking about fluid ounces of water?

12.

Great! Let's put 12 under the second N because the 12 fl oz of water is the number in each group.

(Writes).

Check off 12 and write 12 underneath the second N.

After we check off the 12, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the second Equal Groups step.

Check off 2-EG.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

3 × 3.

What's 3 × 3?

9.

Nice! Let's write 9 under 3 × 3 and bring down the times 12.

(Writes.)

What do we need to do next to make both the sides the same?

9 × 12.

What's 9 × 12? If you don't know, you can use your Multiplication Table poster.

108.

Yes. (3 × 3) × 12 is the same as 108. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 108.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 108 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Fluid ounces of water.

We underlined fluid ounces of water, right here (point)**. We used the words fluid ounces of water for our label. So, we write fluid ounces, or fl oz, of water after the number 108.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Alexa drank 3 glasses of water every day for 3 days. Each glass contained 12 fl oz of water. What is the total amount of water in fluid ounces that Alexa drank?"

Did we answer the question, "What is the total amount of water in fluid ounces that Alexa drank?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is fluid ounces of water.

What words did we underline in our question sentence?

Fluid ounces.

Exactly. We underlined fluid ounces. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step problem using the Equal Groups schema with a missing product two times! Let's try one more.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

There are 5 ounces of soda in a can. There are 10 cans of soda in a case. How many ounces of soda are in 3 cases?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	*$(GR \times N) \times N =$ ___*
Relevant Information:	*GR = 5; N = 10; N = 3*
Number Sentence:	*$(5 \times 10) \times 3 =$ ___*
Answer:	*___ = 150 ounces of soda*

Follow the step-by-step dialogue for Problem B.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

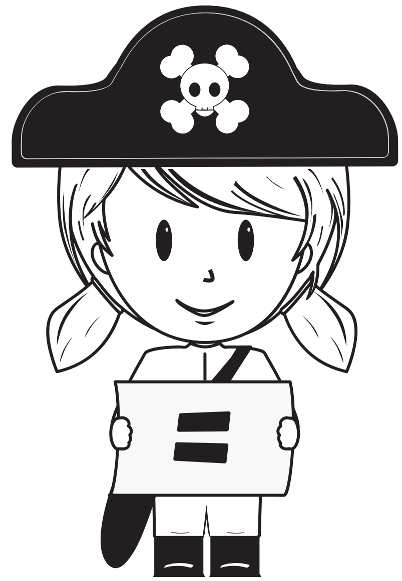
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 31



ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Equal Groups and Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review

Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 31
Buccaneer Problems: Lesson 31
Jolly Roger Review: Lesson 31
Treasure Map
Cubes

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we will complete our Equation Quest activity like we always do. Today, we will work on addition, subtraction, multiplication, and division problems (point)**.**

Point to A.

Let's read the problem. 20 divided by 10 is the same as blank. Let's say that together.

20 divided by 10 is the same as blank.

What do we need to do to balance both of the sides?

Divide 20 by 10.

Exactly. 20 is our product (point)**. 10 is the number of groups** (point)**. We need to find the number *in* each group. We can divide to find the number in each group. We also can think of 20 as our dividend and 10 as our divisor. We divide the dividend by the divisor to find our quotient.**

We can divide to make the two sides the same. What should we divide?

20 divided by 10.

Yes! Let's use cubes to solve this problem. If we have 20 and we want to divide by 10, we need to divide the 20 into 10 groups. Go ahead and count out 20 cubes.

(Counts.)

Now what do we need to do?

Make 10 groups.

Nice! Let's divide the 20 into 10 equal groups.

(Divides.)

Guide student to make 10 groups with 2 cubes in each group.

Now, how many cubes are in each group of 10?

2.

Nice! So what is 20 divided by 10? How many cubes do we have in each of the 10 groups?

2.

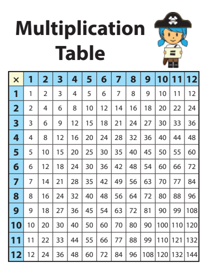
Exactly! 20 divided by 10 is the same as 2. What is blank the same as?

2.

(Writes.)

Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.



To check our work, we identify our divisor as 10 (point)**. Then, we find the left blue row starting with 10 and put a finger on the 10** (point)**. Then, we slide our finger over until we get to 20, our dividend. Then, we slide our finger up from the 20 to the top of the blue column** (point)**. At the top of the blue column, we see the number 2, our quotient** (demonstrate)**.**

Provide guidance for using the Multiplication Table poster as needed.

What number is our finger on at the top of the blue column?

2.

Nice! So what is our quotient, or answer?

2.

Exactly! 20 divided by 10 is the same as 2. What is blank the same as?

2.

(Writes.)

Let's read the number sentence together.

20 divided by 10 is the same as 2.

Let's try another one.

Point to B.

This problem says 13 is *the same as* 4 plus blank. Let's read that together.

13 is the same as 4 plus blank.

To solve this problem with cubes, what do we need to do?

Add cubes until both sides are the same.

Good! How many cubes should we put on this side of the equal sign (point to left side of the equal sign)**?**

13 cubes.

Good! Let's place 13 cubes on this side (point) **of the equal sign.**

(Places cubes.)

Good! What do we need to place on the other side of the equal sign (point to right side of the equal sign)**?**

4 cubes.

Excellent! Go ahead and place 4 cubes on that side of the equal sign (point)**.**

(Places cubes.)

The equal sign acts as a balance. We need to make these sides the same. How many cubes can we add to this side (point) **to make the sides the same? Let's add 1 cube at a time. Let's use different colored cubes to make it easy to see how many cubes we added.**

(Adds cubes.)

Are the sides the same?

Yes.

You have 13 cubes on this side of the equal sign (point)**, and 13 cubes on that side of the equal sign** (point)**.**

How many cubes did you add to make the sides the same?

9.

That's right. You added 9 cubes. So, 13 is *the same as* 4 plus 9. Go ahead and write 9.

(Writes.)

Let's read the number sentence together.

13 is the same as 4 plus 9.

Let's try another one.

Point to C.

9 minus blank is *the same as* 5.

To solve this problem with cubes, what do we need to do?

Subtract cubes until both sides are the same.

Good! How many cubes should we put on this side of the equal sign (point to left side of the equal sign)**?**

9 cubes.

Nice! Go ahead and place 9 cubes (place 9 cubes of one color) **on this side of the equal sign.**

Place 9 cubes.

How many cubes do we need to place on this side (point to right side of the equal sign)**?**

5.

Yes! Let's place 5 cubes (place 5 cubes of one color) **on this side of the equal sign.**

Place 5 cubes.

Are the two sides the same?

No.

Exactly! We have 9 cubes on this side of the equal sign (point) **and 5 cubes on that side of the equal sign** (point)**. Now, the minus sign tells us that we need to subtract. Let's subtract cubes from this side** (point) **until the sides are the same.**

Subtract cubes, one at at time, from 9 until the sides are the same.

(Subtracts cubes.)

How many cubes did we subtract?

4.

9 cubes minus blank is *the same as* 5. So, blank is the same as what?

4.

Yes, 9 minus 4 is *the same as* 5.

Let's read the number sentence together.

9 minus 4 is the same as 5.

Let's try one more.

Point to D.

Let's read the problem. 5 times blank is the same as 15. Let's say that together.

5 times blank is the same as 15.

What do we need to do?

Balance both of the sides.

Exactly. To balance both of the sides, let's use cubes. Our product is 15 (point)**. We have 5 groups** (point) **and we need to figure out the number in each group. We need to make 5 equal groups until we get to 15. Then, we need to see how many cubes we have in each group.**

Let's go ahead and make 5 equal groups until we get to 15.

(Makes groups.)

Monitor as student makes 5 groups of 3.

How many cubes are in each group of 5?

3.

Exactly! You made 5 groups with 3 in each group. So, 5 times what is the same as 15?

3.

Exactly! 5 times 3 is the same as 15. Now let's use our Multiplication Table poster to check our work.

Display Multiplication Table poster.

To check our work, we put one finger on the 5 in the left blue row (point) **and another finger on the 3 in the top blue column** (point)**. Then, we slide our two fingers together and find the box where they meet** (demonstrate)**. The number**

in the box where the two factors meet is our product (point)**.**

Provide guidance for using the Multiplication Table poster as needed.

At which number did our fingers meet?

15.

Nice! Our fingers met at 15, so we know our factors are correct. 5 times 3 is the same as 15. What is blank the same as?

3.

(Writes.)

Let's read the number sentence together.

5 times 3 is the same as 15.

What does the equal sign mean?

The same as.

That's right. The equal sign means the same as.

Remember, it doesn't matter where the equal sign or blank is in an equation, we still read it the same way.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about multi-step problems that include the Total *and* Equal Groups schemas. Yesterday we started talking about multi-step problems that include the Equal Groups *and* Equal Groups schemas.

Today we are going to continue to practice solving problems that include the Equal Groups schema two times.

Let's review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

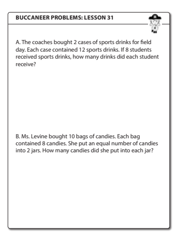
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 31

A. The coaches bought 2 cases of sports drinks for field day. Each case contained 12 sports drinks. If 8 students received sports drinks, how many drinks did each student receive?

B. Ms. Levine bought 10 bags of candies. Each bag contained 8 candies. She put an equal number of candies into 2 jars. How many candies did she put into each jar?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

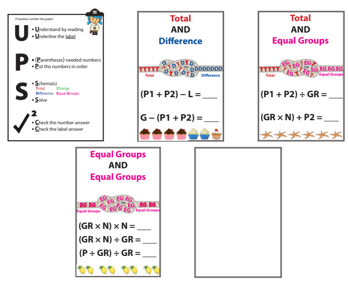
Number it.

<u>*Solution to Problem A:*</u>

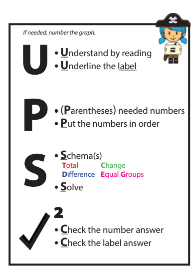
The coaches bought 2 cases of sports drinks for field day. Each case contained 12 sports drinks. If 8 students received sports drinks, how many drinks did each student receive?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	*(GR × N) ÷ GR = __*
Relevant Information:	*GR = 2; N = 12; GR = 8*
Number Sentence:	*(2 × 12) ÷ 8 = __*
Answer:	*__ = 3 sports drinks*

Display Multi-Step Word-Problem Schema Mat - Version 3.



Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 3.



There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "The coaches bought 2 cases of sports drinks for field day. Each case contained 12 sports drinks. If 8 students received sports drinks, how many drinks did each student receive?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

Sports drinks.

Great! Our label is sports drinks. Let's underline sports drinks in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 2. 2 is about cases of sports drinks, so 2 is relevant. Let's put parentheses around 2 cases of sports drinks.

(Writes.)

What is our next number?

12.

Our next number is 12. 12 is about sports drinks, so 12 is relevant. Let's put parentheses around 12 sports drinks.

(Writes.)

What is our last number?

8.

Our last number is 8. 8 is about students. Even though 8 isn't talking about sports drinks, the students received the sports drinks, so 8 is relevant. Let's put parentheses around 8 students.

Why do we need to put parentheses around 8 students?

(Responds.)

All of the numbers in this problem are relevant because they are all about our label, sports drinks. If we had numbers that were not about our label, we would cross them out because the information would be irrelevant and not needed.

Let's put a checkmark next to our first P so we know we have completed that

step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Because we are working multi-step problems, we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "The coaches bought 2 cases of sports drinks for field day. Each case contained 12 sports drinks. If 8 students received sports drinks, how many drinks did each student receive?"

In this problem, we are first making groups with an equal number in each group (gesture)**. Then, we have a product shared equally among groups** (gesture)**.**

If we are making groups with an equal number in each group, above which numbers should we put a 1?

Above 2 and 12.

Nice! First, we need to figure out how many sports drinks there are. There are 2 cases of sports drinks with 12 sports drinks in each case, so we need to make groups with an equal number in each group. Let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 8.

Great! After we make groups with an equal number in each group to determine the number of sports drinks, we need to share the sports drinks equally among 8 students. Let's put a 2 above 8 students.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about?

Equal Groups and and Equal Groups.

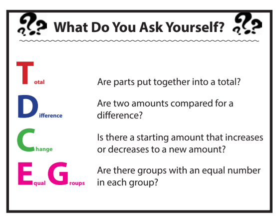
Exactly! Recently, we have been talking about multi-step problems that include the Equal Groups schema two times!

We need to figure out if this problem uses the Equal Groups schema with a missing product two times, the Equal Groups schema with a missing product and then the Equal Groups schema with a known product, or the Equal Groups schema with a known product two times. We also need to figure out which schema we need to use first and which schema we need to use second. What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Display What Do You Ask Yourself? poster.



Read the questions and gesture with student.

First, we need to find the number of sports drinks. There are 12 sports drinks in each of the 2 cases, so we need to make groups with an equal number in each group to find the total number of sports drinks (gesture)**. If we are making groups with an equal number in each group, which schema are we using?**

Equal Groups with a missing product.

Nice! To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema.

What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster again to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we make groups with an equal number in each group, we need to share the sports drinks equally among the students (gesture)**. If we are sharing a product equally among groups, which schema are we using second?**

Equal Groups with a known product.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Equal Groups and Equal Groups poster.

Point to Equal Groups and Equal Groups equations on the Multi-Step Word-Problem Schema Mat - Version 3.

Let's look at our poster. Can you read the equations and tell me about the schemas?

The first equation is (GR × N) × N. This equation includes the Equal Groups schema with a missing product two times. The second equation is (GR × N) ÷ GR. This equation includes the Equal Groups schema with a missing product and then the Equal Groups schema with a known product. The third equation is (P ÷ GR) ÷ GR. This equation includes the Equal Groups schema with a known product two times.

Which equation do we need to use?

(Responds.)

You're right! We need to use the second equation.

How do you know?

Our problem includes the Equal Groups schema with a missing product and then the Equal Groups schema with a known product.

Guide student as needed.

You're right! Let's use our second equation. Our second equation is (GR × N) ÷ GR = __. Let's write it!

Write (GR × N) ÷ GR = __.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Equal Groups and Equal Groups equation, we can plug in our numbers.

We said our first step was to make groups with an equal number in each group. We need to find the total number of sports drinks in the 2 cases. What numbers are talking about the cases of sports drinks?

2 and 12.

Great! Let's put 2 and 12 under GR and N.

(Writes).

Check off 2 and write 2 underneath GR.
Check off 12 and write 12 underneath N.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the first Equal Groups step.

Check off 1-EG.

Now we need to find the second GR. We said our second step was to share the total number of sports drinks equally among the students. What number is talking about the number of students?

8.

Great! Let's put 8 under the second GR because it's the number of groups.

(Writes).

Check off 8 and write 8 underneath the second GR.

After we check off the 8, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the second Equal Groups step.

Check off 2-EG.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

2×12.

What's 2×12? You can use your Multiplication Table poster to help you out if needed.

24.

Nice! Let's write 24 under 2×12 and bring down the divided by 8.

(Writes.)

What do we need to do next to make both sides the same?

$24 \div 8$.

What's $24 \div 8$? You can use your Multiplication Table poster to help you out if needed.

3.

Yes. $(2 \times 12) \div 8$ is the same as 3. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 3.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 3 is the number answer, but we still need a label. Think about what the problem is about. Go back to the words we underlined. What did we underline?

Sports drinks.

We underlined sports drinks, right here (point)**. We used the words sports drinks for our label. So, we write sports drinks after the number 3.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "The coaches bought 2 cases of sports drinks for field day. Each case contained 12 sports drinks. If 8 students received sports drinks, how many drinks did each student receive?"

Did we answer the question, "If 8 students received sports drinks, how many drinks did each student receive?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is sports drinks.

What words did we underline in our question sentence?

Sports drinks.

Exactly. We underlined sports drinks. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Equal Groups problem using the Equal Groups schema with a missing product and then the Equal Groups schema with a known product! Let's try another.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Ms. Levine bought 10 bags of candies. Each bag contained 8 candies. She put an equal number of candies into 2 jars. How many candies did she put into each jar?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(GR \times N) \div GR =$ __
Relevant Information:	*GR = 10; N = 8; GR = 2*
Number Sentence:	$(10 \times 8) \div 2 =$ __
Answer:	__ = *40 candies*

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Lucy will make 10 equal stacks of shirts. Each stack will have 3 shirts. If Lucy has 5 drawers and she wants to put the same number of shirts in each drawer, how many shirts should she put in each drawer?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(GR \times N) \div GR =$ __
Relevant Information:	*GR = 10; N = 3; GR = 5*
Number Sentence:	$(10 \times 3) \div 5 =$ __
Answer:	__ = *6 shirts*

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

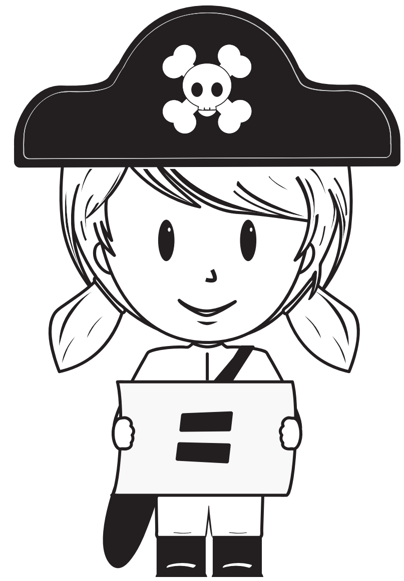
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 32

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Equal Groups and Equal Groups
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 32
Buccaneer Problems: Lesson 32
Jolly Roger Review: Lesson 32
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to do something a little different.

Point to A.

Do you notice anything that's different about this number sentence (point)**?**

(Responds.)

You're right! This number sentence has parentheses. What does this number sentence have?

Parentheses.

Exactly! Whenever you see parentheses, what do you need to do?

Whatever is in parentheses is what you do first.

Exactly! You need to complete the operation in parentheses before you do anything else. This is because parentheses come first in the order of operations.

What do parentheses mean?

(Responds.)

Right! Whatever we see in parentheses, we have to do first. We have talked about this when we have solved multi-step problems. Remind me again, what do parentheses mean?

Whatever is in parentheses, we have to do first.

Why?

Parentheses come first in the order of operations.

Exactly! Parentheses come first in the order of operations, so we need to solve whatever is in parentheses first.

Let's read A (point)**. This number sentence says, open parentheses 5 plus 6 closed parentheses times 2 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 5 plus 6. Why do we need to add 5 plus 6 first?

Because there is a plus sign in the parentheses around the 5 plus 6. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 5 plus 6 first. Let's go ahead and add. What's 5 plus 6?

11.

Yes! 5 plus 6 is the same as 11. Let's write 11 underneath the 5 plus 6.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to multiply.

How do you know?

It says times 2.

Exactly! Let's multiply 11 times 2. What is 11 times 2? You can use the Multiplication Table poster to help you out if needed.

22.

Nice! So, open parentheses 5 plus 6 closed parentheses times 2 is *the same as* what?

22.

Nice work! Go ahead and write the product.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, 20 minus open parentheses 14 minus 2 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Subtract.

How do you know?

There is a minus sign inside the parentheses.

Nice! To solve this problem, we first need to subtract the two numbers in parentheses. What do we need to subtract?

(Responds.)

Exactly! We need to subtract 14 minus 2. Why do we need to subtract 14 minus 2 first?

Because there is a minus sign in the parentheses around the 14 minus 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to subtract 14 minus 2 first. Let's go ahead and subtract. What's 14 minus 2?

12.

Yes! 14 minus 2 is the same as 12. Let's write 12 underneath the 14 minus 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract again.

How do you know?

It says 20 minus before the parentheses.

Exactly! Let's subtract 20 minus 12. Remember, we always want to solve the problem from left to right. What is 20 minus 12?

8.

Nice! So, 20 minus open parentheses 14 minus 2 closed parentheses is *the same as* what?

8.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to C.

Let's read C (point)**. This number sentence says, 16 divided by 8 plus 2 is *the***

same as (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do you notice about this number sentence?

There are no parentheses.

Exactly! When there are no parentheses, we have to look at the other operations. In the order of operations, parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem. What do we do when there are no parentheses?

Pay attention to the order of operations. We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! To solve this problem, what do we need to do first?

(Responds.)

Exactly! We need to divide 16 by 8. Why do we need to divide 16 by 8 first?

Because when there are no parentheses, we follow what comes next in the order of operations. Division comes before addition.

Nice! Division comes before addition in the order of operations. Let's go ahead and divide 16 by 8. What's 16 divided by 8? You can use the Multiplication Table poster to help you out if needed.

2.

Yes! 16 divided by 8 is the same as 2. Let's write 2 underneath the 16 divided by 8.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add 2.

How do you know?

Because addition comes after division in the order of operations.

Exactly! Let's add 2 plus 2. What is 2 plus 2?

4.

Nice! So, 16 divided by 8 plus 2 is *the same as* what?

4.

Nice work! Go ahead and write the sum.

(Writes.)

Let's try one more.

Point to D.

Let's read D (point)**. This number sentence says, 2 times open parentheses 6 plus 4 closed parentheses minus 3 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Now, this number sentence looks a little complicated, but we can solve it the same way. All we need to do is follow the order of operations. What comes first in the order of operations?

Whatever is in parentheses.

Exactly! Let's solve what is in parentheses first and then we will move on to the next operation in the order. What do we need to do?

Solve what is in parentheses first and then move on to the next operation.

Nice! To solve this problem, what do we need to do first?

(Responds.)

Exactly! We need to add 6 plus 4. Why do we need to add 6 plus 4 first?

Because 6 plus 4 is in parentheses and whatever is in parentheses is what you do first.

Nice! Let's go ahead and add 6 plus 4. What's 6 plus 4?

10.

Yes! 6 plus 4 is the same as 10. Let's write 10 underneath the 6 plus 4.

(Writes.)

What do we need to do next? Remember, let's think about what comes next in the order of operations. Do we need to multiply or subtract?

Multiply.

Yes! We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem. Multiplication comes before subtraction in the order of operations, so we need to multiply. Let's multiply 2 times 10. You can use the Multiplication Table poster to help you out if needed.

What's 2 times 10?

20.

Nice! Let's write 20 underneath the 2 times open parentheses 6 plus 4 closed parentheses.

(Writes.)

We are not finished! This problem has another step. What do we need to do last? Remember, we need to solve the problem from left to right.

(Responds.)

Yes! We need to subtract 20 minus 3.

How do you know?

Because subtraction comes after multiplication in the order of operations.

Exactly! Let's subtract 20 minus 3. What is 20 minus 3?

17.

Nice! So, 2 times open parentheses 6 plus 4 closed parentheses minus 3 is *the same as* what?

17.

Nice work! Go ahead and write the difference.

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about multi-step problems that include the Total *and* Equal Groups schemas. Recently we started talking about multi-step problems that include the Equal Groups *and* Equal Groups schemas.

Today we are going to continue to practice solving problems that include the Equal Groups schema two times.

Let’s review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

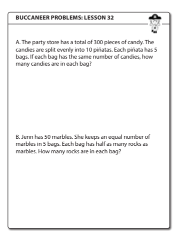
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 32

A. The party store has a total of 300 pieces of candy. The candies are split evenly into 10 piñatas. Each piñata has 5 bags. If each bag has the same number of candies, how many candies are in each bag?

B. Jenn has 50 marbles. She keeps an equal number of marbles in 5 bags. Each bag has half as many rocks as marbles. How many rocks are in each bag?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

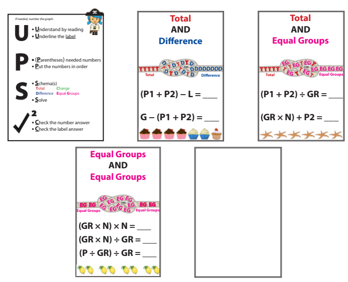
Number it.

<u>Solution to Problem A:</u>

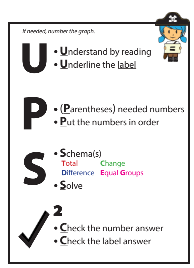
The party store has a total of 300 pieces of candy. The candies are split evenly into 10 piñatas. Each piñata has 5 bags. If each bag has the same number of candies, how many candies are in each bag?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(P \div GR) \div GR = \_\_$
Relevant Information:	$P = 300; GR = 10; GR = 5$
Number Sentence:	$(300 \div 10) \div 5 = \_\_$
Answer:	$\_\_ = 6$ *candies*

Display Multi-Step Word-Problem Schema Mat - Version 3.



Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 3.



There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "The party store has a total of 300 pieces of candy. The candies are split evenly into 10 piñatas. Each piñata has 5 bags. If each bag has the same number of candies, how many candies are in each bag?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

Candies.

Great! Our label is candies. Let's underline candies in our question sentence.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 300. 300 is about pieces of candy, so 300 is relevant. Let's put parentheses around 300 pieces of candy.

(Writes.)

What is our next number?

10.

Our next number is 10. 10 is about piñatas. Even though 10 isn't talking about candies, the candies are split evenly into the piñatas, so 10 is relevant. Let's put parentheses around 10 piñatas.

(Writes.)

What is our last number?

5.

Our last number is 5. 5 is about bags. Even though 5 isn't talking about candies, the candies were put into the bags, so 5 is relevant. Let's put parentheses around 5 bags.

Why do we need to put parentheses around 5 bags?

(Responds.)

All of the numbers in this problem are relevant because they are all about our label, candies. If we had numbers that were not about our label, we would cross them out because the information would be irrelevant and not needed.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Because we are working multi-step problems, we have to think very carefully about which numbers come first and which numbers come second. To do this, we need to figure out what is happening first in the problem and what is happening second in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "The party store has a total of 300 pieces of candy. The candies are split evenly into 10 piñatas. Each piñata has 5 bags. If each bag has the same number of candies, how many candies are in each bag?"

In this problem, we have a product shared equally among groups (gesture)**. Then, we have a product shared equally among groups a second time** (gesture)**.**

If we have a product shared equally among groups two times, we need to think about the first time we are sharing a product equally among groups. Above which numbers should we put a 1?

Above 300 and 10.

Nice! First, we need to figure out how many candies there are in each piñata. There are 300 candies split evenly into the 10 piñatas, so we need to share a product equally among groups. Let's put a 1 above both of those numbers.

(Writes.)

Above which number(s) should we put a 2?

Above the 5.

Great! After we share a product equally among groups, we need to share a product equally among groups a second time. After we share the candies equally among the piñatas, we need to share the candies in the piñatas equally among the bags. Let's put a 2 above 5 bags.

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about?

Equal Groups and and Equal Groups.

Exactly! Recently, we have been talking about multi-step problems that include the Equal Groups schema two times!

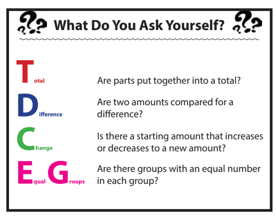
We need to figure out if this problem uses the Equal Groups schema with a missing product two times, the Equal Groups schema with a missing product and then the Equal Groups schema with a known product, or the Equal Groups schema with a known product two times. We also need to figure out which schema we need to use first and which schema we need to use second.

What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Display What Do You Ask Yourself? poster.



Read the questions and gesture with student.

First, we need to find the number of candies in each piñata. There are 300 candies split evenly into 10 piñatas, so we need to share a product equally among groups to find the total number of candies in each piñata (gesture)**. If we are sharing a product equally among groups, which schema are we using?**

Equal Groups with a known product.

Nice! To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema.

What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster again to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we share a product equally among groups to find the number of candies in each piñata, we need to share the candies in each piñata equally among the bags (gesture)**. If we are sharing a product equally among groups, which schema are we using second?**

Equal Groups with a known product.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Equal Groups and Equal Groups poster.

Point to Equal Groups and Equal Groups equations on the Multi-Step Word-Problem Schema Mat - Version 3.

Let's look at our poster. Can you read the equations for me and tell me about the schemas in each one?

The first equation is $(GR \times N) \times N$. This equation includes the Equal Groups schema with a missing product two times. The second equation is $(GR \times N) \div GR$. This equation includes the Equal Groups schema with a missing product and then the Equal Groups schema with a known product. The third equation is $(P \div GR) \div GR$. This equation includes the Equal Groups schema with a known product two times.

Which equation do we need to use?

(Responds.)

You're right! We need to use the third equation.

How do you know?

Our problem includes the Equal Groups schema with a known product two times.

Guide student as needed.

You're right! Let's use our third equation. Our third equation is (P ÷ GR) ÷ GR = __. Let's write it!

Write (P ÷ GR) ÷ GR = __.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Equal Groups equation, we can plug in our numbers.

We said our first step was to share a product equally among groups. We need to find the number of candies in each of the 10 piñatas. What numbers are talking about the candies and piñatas?

300 and 10.

Great! Let's put 300 and 10 under P and GR.

(Writes).

Check off 300 and write 300 underneath P.
Check off 10 and write 10 underneath GR.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the first Equal Groups step.

Check off 1-EG.

Now we need to find the second GR. We said our second step was to share the total number of candies in each piñata equally among the bags. What number is talking about the number of bags?

5.

Great! Let's put 5 under the second GR because it's the number of groups.

(Writes).

Check off 5 and write 5 underneath the second GR.

After we check off the 5, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the second Equal Groups step.

Check off 2-EG.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

300 ÷ 10.

What's 300 ÷ 10? You can use your Multiplication Table poster to help you out if needed.

30.

Nice! Let's write 30 under 300 ÷ 10 and bring down the divided by 5.

(Writes.)

What do we need to do next to make both sides the same?

30 ÷ 5.

What's 30 ÷ 5? You can use your Multiplication Table poster to help you out if needed.

6.

Yes. (300 ÷ 10) ÷ 5 is the same as 6. Have we balanced both of the sides?

Yes.

Nice! Go ahead and write 6.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 6 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Candies.

We underlined candies, right here (point)**. We used the word candies for our label. So, we write candies after the number 6.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "The party store has a total of 300 pieces of candy. The candies are split evenly into 10 piñatas. Each piñata has 5 bags. If each bag has the same number of candies, how many candies are in each bag?"

Did we answer the question, " If each bag has the same number of candies, how many candies are in each bag?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is candies.

What word did we underline in our question sentence?

Candies.

Exactly. We underlined candies. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this multi-step Equal Groups problem using the Equal Groups schema with a known product two times! Let's try another.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Jenn has 50 marbles. She keeps an equal number of marbles in 5 bags. Each bag *has half as many rocks as marbles. How many rocks are in each bag?*

Problem Type:	*Equal Groups and Equal Groups*
Equation:	*(P ÷ GR) ÷ GR = __*
Relevant Information:	*P = 50; GR = 5; GR = 2*
Number Sentence:	*(50 ÷ 5) ÷ 2 = __*
Answer:	*__ = 5 rocks*

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.
Review that half means we need to divide by 2.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

There are a total of 36 polar bears at the North Pole. An equal number of polar bears live on 3 different icebergs. Half of the bears on each iceberg are female. How many female polar bears are on each iceberg?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	*(P ÷ GR) ÷ GR = __*
Relevant Information:	*P = 36; GR = 3; GR = 2*
Number Sentence:	*(36 ÷ 3) ÷ 2 = __*
Answer:	*__ = 6 female polar bears*

Follow the step-by-step dialogue for Problem A.
Continue to use Multiplication Table poster as needed.
Review that half means we need to divide by 2.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

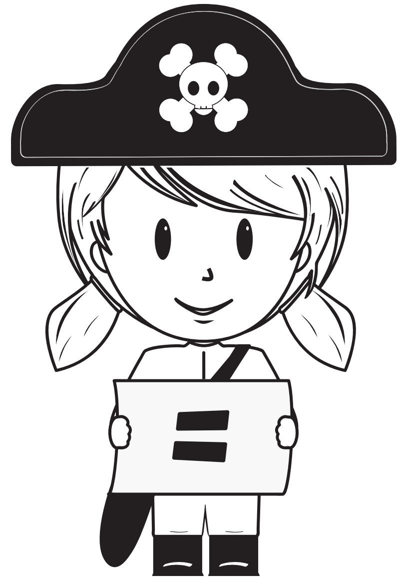
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 33

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
    Multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 33
Buccaneer Problems: Lesson 33
Jolly Roger Review: Lesson 33
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, 10 minus 4 times 2 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do you notice about this number sentence?

There are no parentheses.

Exactly! When there are no parentheses, we have to look at the other operations. In the order of operations, parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem. What do we do when there are no parentheses?

Pay attention to the order of operations. We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! To solve this problem, what do we need to do first?

(Responds.)

Exactly! We need to multiply 4 times 2. Why do we need to multiply 4 times 2 first?

Because when there are no parentheses, we follow what comes next in the order of operations. Multiplication comes before subtraction.

Nice! Multiplication comes before subtraction in the order of operations. Let's go ahead and multiply 4 times 2. What's 4 times 2? You can use the Multiplication Table poster to help you out if needed.

8.

Yes! 4 times 2 is the same as 8. Let's write 8 underneath the 4 times 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract 10 minus 8.

How do you know?

Because subtraction comes after multiplication in the order of operations.

Exactly! Let's subtract 10 minus 8. What is 10 minus 8?

2.

Nice! So, 10 minus 4 times 2 is *the same as* what?

2.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, 18 minus open parentheses 6 plus 2 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 6 plus 2. Why do we need to add 6 plus 2 first?

Because there is a plus sign in the parentheses around the 6 plus 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 6 plus 2 first. Let's go ahead and add. What's 6 plus 2?

8.

Yes! 6 plus 2 is the same as 8. Let's write 8 underneath the 6 plus 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says 18 minus.

Exactly! Let's subtract 18 minus 8. What is 18 minus 8?

10.

Nice! So, 18 minus open parentheses 6 plus 2 closed parentheses is *the same as* what?

10.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to C.

Let's read C (point)**. This number sentence says, 1 plus 2 times 4 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do you notice about this number sentence?

There are no parentheses.

Exactly! When there are no parentheses, we have to look at the other operations. In the order of operations, parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem. What do we do when there are no parentheses?

Pay attention to the order of operations. We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! To solve this problem, what do we need to do first?

(Responds.)

Exactly! We need to multiply 2 times 4. Why do we need to multiply 2 times 4 first?

Because when there are no parentheses, we follow what comes next in the order of operations. Multiplication comes before addition.

Nice! Multiplication comes before addition in the order of operations. Let's go ahead and multiply 2 times 4. What's 2 times 4? You can use the Multiplication Table poster to help you out if needed.

8.

Yes! 2 times 4 is the same as 8. Let's write 8 underneath the 2 times 4.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add the 1 to the 8.

How do you know?

Because addition comes after multiplication in the order of operations.

Exactly! Let's add 1 plus 8. What is 1 plus 8?

9.

Nice! So, 1 plus 2 times 4 is *the same as* what?

9.

Nice work! Go ahead and write the sum.

(Writes.)

Let's try one more.

Point to D.

Let's read D (point)**. This number sentence says, open parentheses 2 times 6 closed parentheses divided by 2 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 2 times 6. Why do we need to multiply 2 times 6 first?

Because there is a times sign in the parentheses around the 2 times 6. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 2 times 6 first. Let's go ahead and multiply. What's 2 times 6? You can use the Multiplication Table poster to help you out if needed.

12.

Yes! 2 times 6 is the same as 12. Let's write 12 underneath the 2 times 6.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to divide.

How do you know?

It says divided by 2.

Exactly! Let's divide 12 by 2. What is 12 divided by 2? You can use the Multiplication Table poster to help you out if needed.

6.

Nice! So, open parentheses 2 times 6 closed parentheses divided by 2 is *the same as* what?

6.

Nice work! Go ahead and write the quotient.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about multi-step problems that include the Total *and* Equal Groups schemas. Recently we started talking about multi-step problems that include the Equal Groups *and* Equal Groups schemas.

Today we are going to continue to practice solving multi-step problems.

Let's review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

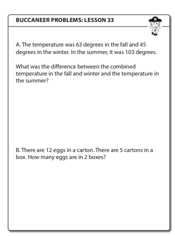
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 33

A. The temperature was 63 degrees in the fall and 45 degrees in the winter. In the summer, it was 103 degrees.

What was the difference between the combined temperature in the fall and winter and the temperature in the summer?

B. There are 12 eggs in a carton. There are 5 cartons in a box. How many eggs are in 2 boxes?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem A:

The temperature was 63 degrees in the fall and 45 degrees in the winter. In the summer, it was 103 degrees. What was the difference between the combined temperature in the fall and winter and the temperature in the summer?

Problem Type:	*Total and Difference*
Equation:	*(P1 + P2) – L = __*
Relevant Information:	*P1 = 63; P2 = 45; L = 103*
Number Sentence:	*(63 + 45) – 103 = __*
Answer:	*__ = 5 degrees*

Follow the step-by-step dialogue for a Total and Difference multi-step problem with a combined amount that's greater.
Review with student that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2) – L = __.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

There are 12 eggs in a carton. There are 5 cartons in a box. How many eggs are in 2 boxes?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	*(GR × N) × N = __*

Relevant Information: *GR = 5; N = 12; N = 2*
Number Sentence: *(5 × 12) × 2 = __*
Answer: *__ = 120 eggs*

Follow the step-by-step dialogue for an Equal Groups and Equal Groups multi-step problem.
Continue to use Multiplication Table poster as needed.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Daria has 42 baseball gloves and 7 baseball bats. She will put her items on 7 shelves. She will put the same number of items on each shelf. How many items will Daria put on each shelf?

Problem Type: *Total and Equal Groups*
Equation: *(P1 + P2) ÷ GR = __*
Relevant Information: *P1 = 42; P2 = 7; GR = 7*
Number Sentence: *(42 + 7) ÷ 7 = __*
Answer: *__ = 7 items*

Follow the step-by-step dialogue for a Total and Equal Groups multi-step problem.
Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

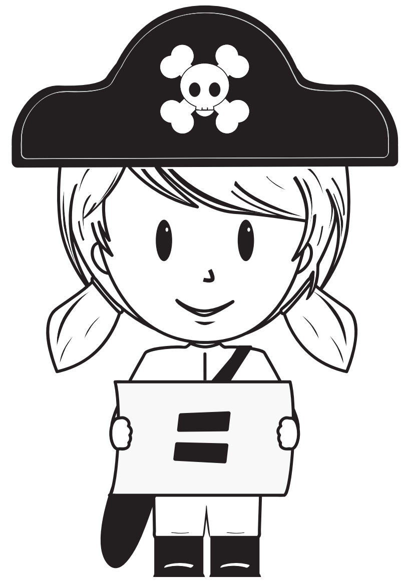
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 34



ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review

Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 3

Student Materials

Equation Quest: Lesson 34
Buccaneer Problems: Lesson 34
Jolly Roger Review: Lesson 34
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, open parentheses 116 plus 5 closed parentheses minus 9 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 116 plus 5. Why do we need to add 116 plus 5 first?

Because there is a plus sign in the parentheses around the 116 plus 5. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 116 plus 5 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to add. What's 116 plus 5?

121.

Yes! 116 plus 5 is the same as 121. Let's write 121 underneath the 116 plus 5.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says minus 9.

Exactly! Let's subtract 121 minus 9. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to subtract. What is 121 minus 9?

112.

Nice! So, open parentheses 116 plus 5 closed parentheses minus 9 is *the same as* what?

112.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, open parentheses 265 plus 40 closed parentheses minus 30 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 265 plus 40. Why do we need to add 265 plus 40 first?

Because there is a plus sign in the parentheses around the 265 plus 40. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 265 plus 40 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to add. What's 265 plus 40?

305.

Yes! 265 plus 40 is the same as 305. Let's write 305 underneath the 265 plus 40.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says minus 30.

Exactly! Let's subtract 305 minus 30. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to subtract. What is 305 minus 30?

275.

Nice! So, open parentheses 265 plus 40 closed parentheses minus 30 is *the same as* what?

275.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try one more.

Point to C.

Let's read C (point)**. This number sentence says, open parentheses 9 times 9 closed parentheses plus 26 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply the numbers in parentheses. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 9 times 9. Why do we need to multiply 9 times 9 first?

Because there is a times sign in the parentheses around the 9 times 9. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 9 times 9 first. Let's go ahead and multiply. What's 9 times 9? You can use the Multiplication Table poster to help you out if needed.

81.

Yes! 9 times 9 is the same as 81. Let's write 81 underneath the 9 times 9.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to add.

How do you know?

It says plus 26.

Exactly! Let's add 81 plus 26. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What is 81 plus 26?

107.

Nice! So, open parentheses 9 times 9 closed parentheses plus 26 is *the same as* what?

107.

Nice work! Go ahead and write the sum.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when

you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about multi-step problems that include the Total *and* Equal Groups schemas. Recently we started talking about multi-step problems that include the Equal Groups *and* Equal Groups schemas.

Today we are going to continue to practice solving multi-step problems.

Let's review. Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

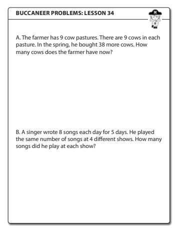
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 34

A. The farmer has 9 cow pastures. There are 9 cows in each pasture. In the spring, he bought 38 more cows. How many cows does the farmer have now?

B. A singer wrote 8 songs each day for 5 days. He played the same number of songs at 4 different shows. How many songs did he play at each show?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem A:</u>

The farmer has 9 cow pastures. There are 9 cows in each pasture. In the spring, he bought 38 more cows. How many cows does the farmer have now?

Problem Type:	*Total and Equal Groups*
Equation:	$(GR \times N) + P2 = \_\_$
Relevant Information:	$GR = 9; N = 9; P2 = 38$
Number Sentence:	$(9 \times 9) + 38 = \_\_$
Answer:	$\_\_ = 119$ *cows*

Follow the step-by-step dialogue for a Total and Equal Groups multi-step problem. Continue to use Multiplication Table poster as needed.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem B:</u>

A singer wrote 8 songs each day for 5 days. He played the same number of songs at 4 different shows. How many songs did he play at each show?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(GR \times N) \div GR =$ __
Relevant Information:	$GR = 5; N = 8; GR = 4$
Number Sentence:	$(5 \times 8) \div 4 =$ __
Answer:	__ = 10 songs

Follow the step-by-step dialogue for an Equal Groups and Equal Groups multi-step problem.
Continue to use Multiplication Table poster as needed.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

At the basketball game, Tabitha spent $12.00 on snacks and $22.00 on a t-shirt. If Tabitha brought a $50.00 bill to the game, how much change did she receive?

Problem Type:	*Total and Difference*
Equation:	*G – (P1 + P2) = __*
Relevant Information:	*G = 50; P1 = 12; P2 = 22*
Number Sentence:	*50 – (12 + 22) = __*
Answer:	*__ = $16.00*

Follow the step-by-step dialogue for a Total and Difference multi-step problem. Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2) = __.
**Note: student may solve this problem as a double Change problem with 2 decreases if desired.*

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

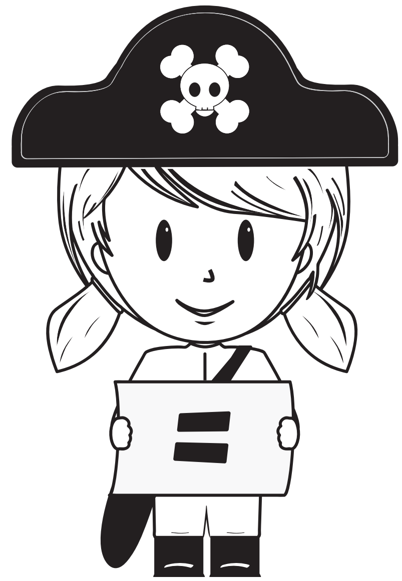
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 35

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Multi-step Equal Groups and Total/Difference
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 35
Buccaneer Problems: Lesson 35
Jolly Roger Review: Lesson 35
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, 54 minus open parentheses 6 times 2 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 6 times 2. Why do we need to multiply 6 times 2 first?

Because there is a times sign in the parentheses around the 6 times 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 6 times 2 first. Let's go ahead and multiply. What's 6 times 2? You can use the Multiplication Table poster to help you out if needed.

12.

Yes! 6 times 2 is the same as 12. Let's write 12 underneath the 6 times 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says 54 minus.

Exactly! Let's subtract 54 minus 12. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to subtract. What is 54 minus 12?

42.

Nice! So, 54 minus open parentheses 6 times 2 closed parentheses is *the same as* what?

42.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, open parentheses 88 plus 6 closed parentheses minus 44 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 88 plus 6. Why do we need to add 88 plus 6 first?

Because there is a plus sign in the parentheses around the 88 plus 6. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 88 plus 6 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What's 88 plus 6?

94.

Yes! 88 plus 6 is the same as 94. Let's write 94 underneath the 88 plus 6.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says minus 44.

Exactly! Let's subtract 94 minus 44. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to subtract. What is 94 minus 44?

50.

Nice! So, open parentheses 88 plus 6 closed parentheses minus 44 is *the same as* what?

50.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try one more!

Point to C.

Let's read C (point)**. This number sentence says, open parentheses 134 plus 69 closed parentheses minus 32 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 134 plus 69. Why do we need to add 134 plus 69 first?

Because there is a plus sign in the parentheses around the 134 plus 69. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 134 plus 69 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to add. What's 134 plus 69?

203.

Yes! 134 plus 69 is the same as 203. Let's write 203 underneath the 134 plus 69.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says minus 32.

Exactly! Let's subtract 203 minus 32. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to subtract. What is 203 minus 32?

171.

Nice! So, open parentheses 134 plus 69 closed parentheses minus 32 is *the same as* what?

171.

Nice work! Go ahead and write the difference.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate

Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

So far, we have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems that include two steps. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas. We have learned about problems that include the Equal Groups *and* Equal Groups schemas.

Today, we are going to talk about another type of multi-step problem. We are going to learn about multi-step problems that include three schemas! We will solve these problems exactly how we solve two-step problems.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

Yes. We always have to check if the word problem has a table or a graph.

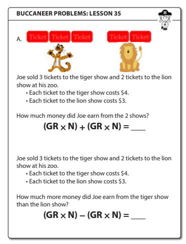
Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

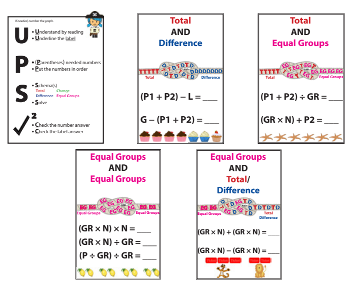
Very good.

Point to A.



Today we are going to talk about three-step word problems that are Equal Groups *and* Total problems. We also will talk about three-step word problems that are Equal Groups *and* Difference problems. Let me show you what I mean.

Display Multi-Step Word-Problem Schema Mat - Version 4.



Our program is called Pirate Math Equation Quest. Pirates use ropes like this one (point to the rope on the Equal Groups and Total/Difference poster) **on their ships to power and lift their sails.**

What do you notice about the rope on this poster?

(Responds.)

Exactly! We see the words equal groups with EG's on one side of the rope. We

see the words total and difference with T's and D's on the other side of the rope.

What do you notice about the EG's, T's, and D's in the center of the knot?

(Responds.)

Yes! The EG's, T's, and D's are mixed together. This is to show that sometimes we have problems that are a mix of the Equal Groups and Total schemas. Other times we have problems that are a mix of the Equal Groups and Difference schemas.

Let me show you what I mean. I am going to show you the two examples of three-step problems that you are most likely to see. The first example includes the Equal Groups schema used two times and the Total schema used one time. The second example includes the Equal Groups schema used two times and the Difference schema used one time.

Point to A.

Let's read the first problem. "Joe sold 3 tickets to the tiger show and 2 tickets to the lion show at his zoo. Each ticket to the tiger show costs $4. Each ticket to the lion show costs $3. How much money did Joe earn from the 2 shows?"

Circle 3, 2, 4, 3, and 2 in the story as you say the following:

This is an Equal Groups story because we have groups with an equal number in each group. The groups are the tickets to the tiger show and the number in each group is the cost of each ticket to the tiger show. It says, "Joe sold 3 tickets to the tiger show. Each ticket to the tiger show costs $4." Joe has tickets to the tiger show and each ticket costs the same amount of money (gesture)**.**

Why is it an Equal Groups story?

(Responds.)

We have groups: the tickets to the tiger show, with an equal number in each group: the cost of each ticket to the tiger show. We know we have an Equal Groups problem (gesture)**.**

What are the groups?

(Responds.)

What is the equal number in each group?

(Responds.)

But this problem is not just a single-step Equal Groups problem! What else is happening?

(Responds.)

Exactly! Joe also sold tickets to the lion show! We have a second Equal Groups schema because we have groups with an equal number in each group. The groups are the tickets to the lion show and the number in each group is the cost of each ticket to the lion show. It says, "Joe sold 2 tickets to the lion show. Each ticket to the lion show costs $3." Joe has tickets to the lion show and each ticket costs the same amount of money (gesture)**.**

We have groups: the tickets to the lion show, with an equal number in each group: the cost of each ticket to the lion show. We know we have an Equal Groups problem (gesture)**.**

What are the groups?

(Responds.)

What is the equal number in each group?

(Responds.)

But wait! Something else is happening! Joe sold tickets to the tiger show and tickets to the lion show. What happens next?

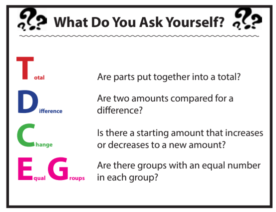
(Responds.)

Let's read our question sentence, "How much money did Joe earn from the 2 shows?" What is the question asking us?

(Responds.)

Yes! We want to find out how much money Joe earned from the tiger show and the lion show. What kind of schema do you think we need to use to find out how much money Joe earned from the two shows? You can use your What Do You Ask Yourself? poster to help you out.

Display What Do You Ask Yourself? poster.



(Responds.)

Good thinking! It says, "How much money did Joe earn from the 2 shows?" We have the money Joe earned from the tiger show (gesture)**. We also have the money that Joe earned from the lion show** (gesture)**. Whenever we are putting parts together, what kind of schema do we have?**

Total.

You're right! In Total problems, we put parts together for a total. In this problem, we have part one: the money Joe earned from the tiger show, and part two: the money Joe earned from the lion show (gesture)**.**

Let's review. What are the three schemas we are using in this problem?

Equal Groups, Equal Groups, and Total.

Excellent! This problem includes the Equal Groups schema two times and the Total schema. When we have three-step problems that include three schemas, we have new equations to help us solve the problem!

What do you notice about this equation (point to (GR × N) + (GR × N) = __)**?**

(Responds.)

Wow! You really have your thinking cap on today! Nice work! Our problem is an Equal Groups problem and a Total problem, but we use the Equal Groups schema two times! Our equation is two Equal Groups equations and one Total

equation combined!

We have (GR × N) + (GR × N) = __.

What do GR and N stand for?

The number of groups and the number in each group.

Exactly! GR stands for the groups and N stands for the number in each group. In this problem, we have groups: the number of tickets Joe sold to the tiger show, and an equal number in each group: the cost of each ticket to the tiger show (gesture)**.**

We have another set of GR × N in our equation. What do the second GR and N stand for?

The number of groups and the number in each group.

Exactly! GR stands for the groups and N stands for the number in each group. In this problem, we have groups: the number of tickets Joe sold to the lion show, and an equal number in each group: the cost of each ticket to the lion show (gesture)**.**

Do you notice anything else that is different or new in this equation?

There are two sets of parentheses.

Nice! We have two sets of parentheses. The parentheses (point) **are first in the order of operations. All that means is that we need to multiply the numbers in first set of parentheses and multiply the numbers in the second set of parentheses FIRST when we solve this problem. What do parentheses mean?**

(Student.)

Exactly! Whatever you see in parentheses, you need to do first. What do you see in parentheses in this problem?

GR and N and GR and N.

Right! So what does that mean?

We need to multiply GR times N in both sets of parentheses before we add the products.

Nice! You need to multiply GR times N in both sets of parentheses before you add the products.

Now before we practice solving multi-step problems, let's look at another example of a three-step word problem. This word problem uses the Equal Groups schema two times and the Difference schema one time.

This second problem is similar to the problem we just read, but our equation is a little different.

Circle 3, 2, 4, and 3 in the story as you say the following:

Let's read the second problem (point)**. "Joe sold 3 tickets to the tiger show and 2 tickets to the lion show at his zoo. Each ticket to the tiger show costs $4. Each ticket to the lion show costs $3. How much more money did Joe earn from the tiger show than the lion show?"**

What about this problem is *the same* as the first problem?

(Responds.)

Good job! Both problems are talking about tickets sold to the tiger and lion shows and both problems have the same numbers.

What about this problem is *different* from the first problem?

(Responds.)

Nice! In the first problem, we put parts together for a total. We combined the amount of money Joe earned at the tiger show with the amount of money Joe earned at the lion show (gesture)**. In this problem, we are comparing how much money Joe earned from the tiger show with how much money Joe earned from the lion show** (gesture)**.**

Let's look at this equation (point to (GR × N) – (GR × N) = ___)**.**

How is this equation different from our first equation?

(Responds.)

Excellent! In this equation, we are subtracting the two products to find the difference.

Let's review. What is happening in the first problem?

(Responds.)

In the first problem, we used the Equal Groups schema to figure out how much money Joe earned from the tiger show. We used the Equal Groups schema a second time to figure out how much money Joe earned from the lion show. Then, we combined the amount of money Joe earned from the tiger show with the amount of money Joe earned from the lion show (gesture)**. Our first problem used the Equal Groups schema two times and the Total schema one time.**

What is happening in the second problem?

(Responds.)

In the second problem, we need to use the Equal Groups schema to figure out how much money Joe earned from the tiger show. We need to use the Equal Groups schema a second time to figure out how much money Joe earned from the lion show. Then, we need to compare the amount of money Joe earned from the tiger show with the amount of money Joe earned from the lion show (gesture)**. If we are comparing two amounts, which schema are we using? Look at the What Do You Ask Yourself? poster if you need some help.**

Difference.

Nice job! Our second problem uses the Equal Groups schemas two times and the Difference schema one time. Today, we will practice solving three-step word problems that use the Equal Groups and Total schemas or the Equal Groups and Difference schemas.

Remind me, what are our two equations?

$(GR \times N) + (GR \times N) = \_\_$ and $(GR \times N) - (GR \times N) = \_\_$.

Nice! When do we use the first equation?

(Responds.)

Yes! We use the first equation (point) **when we have a problem that includes the Equal Groups schema two times and the Total schema one time. When do we use the second equation?**

(Responds.)

Yes! We use the second equation (point) **when we have a problem that includes the Equal Groups schema two times and the Difference schema one time.**

Remind me again, what do the parentheses mean?

(Responds.)

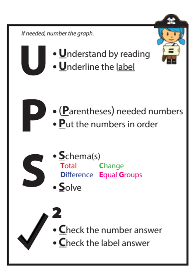
And what do we do when we have two sets of parentheses?

(Responds.)

Awesome! Now, are you ready to practice solving multi-step problems?

(Responds.)

Point to UPS Check² poster on the Multi-Step Word-Problem Schema Mat - Version 4.



Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Kate bought 3 purple necklaces and 4 blue necklaces. Each purple necklace costs $5. Each blue necklace costs $6. How much money did Kate spend?

Problem Type:	*Equal Groups, Equal Groups, and Total*
Equation:	$(GR \times N) + (GR \times N) = \_\_$
Relevant Information:	$GR = 3; N = 5; GR = 4; N = 6$
Number Sentence:	$(3 \times 5) + (4 \times 6) = \_\_$
Answer:	$\_\_ = \$39$

Excellent! There is not a table or graph, so we are ready to follow our UPS Check² steps.

To help us remember to use UPS Check², let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "Kate bought 3 purple necklaces and 4 blue necklaces. Each purple necklace costs $5. Each blue necklace costs $6. How much money did Kate spend?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

(Responds.)

The problem asks us about how much money Kate spent. If the question is asking about money, what is a good label?

(Responds.)

Great! Our label is dollars. If we did not know if we were talking about dollars or cents, we could have looked back at our numbers. Our numbers have dollar signs in front of them, so we know we are talking about dollars. Go ahead and underline money and write dollars or a dollar sign underneath it.

(Writes.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 3. 3 is about purple necklaces and our label is dollars. Kate spent money on necklaces, so 3 is relevant. Let's put parentheses around 3 purple necklaces.

(Writes.)

What is our next number?

4.

Our next number is 4. 4 is about blue necklaces and our label is dollars. Kate spent money on necklaces, so 4 is relevant. Let's put parentheses around 4 blue necklaces.

(Writes.)

What is our next number?

5.

Our next number is 5. 5 is about dollars, so 5 is relevant. Let's put parentheses around $5.

(Writes.)

What is our last number?

6.

Our last number is 6. 6 is about dollars, so 6 is relevant. Let's put parentheses around $6.

(Writes.)

All of the numbers in this problem are relevant because they are all about or related to our label, dollars. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Now that we are solving problems with three steps, we will put a 3 above any needed numbers or information involved in the third step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem, a 2 above any needed numbers involved in the second step of solving the problem, and a 3 above any needed numbers that talk about what is happening third.

Because we are working three-step problems, we have to think very carefully about what is happening first in the problem, what is happening second in the problem, and what is happening third in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

And what will we put above numbers that talk about what is happening third?

3.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second. We will put a 3 above the numbers that talk about what is happening third.

Ordering our numbers will help us during our next step, S, when we need to

choose which schema to use first, which schema to use second, and which schema to use third to solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "Kate bought 3 purple necklaces and 4 blue necklaces. Each purple necklace costs $5. Each blue necklace costs $6. How much money did Kate spend?"

In this problem, we have groups, purple neckaces, and an equal number in each group, the cost of each purple necklace (gesture)**.**

What are the groups and the number in each group?

(Responds.)

Then, we have groups, the blue necklaces, and an equal number in each group, the cost of each blue necklace (gesture)**.**

What are the groups and the number in each group?

(Responds.)

Lastly, we want to know how much money Kate spent on purple and blue necklaces.

What do we want to know?

(Responds.)

This problem is a lot like the first zoo problem where we had groups with an equal number in each group two times and then we put parts together to find the total.

First, we have groups: purple necklaces, and an equal number in each group: the cost of each purple necklace. Above which numbers should we put a 1?

Above 3 and 5.

Nice! Even though the 3 and the 5 are not next to each other, they are the two numbers involved in the first step of solving the problem. They are both about purple necklaces. Pay close attention that you put a 1 above 3 purple necklaces and $5. Go ahead and put a 1 above both of those numbers.

(Writes.)

Next, we have groups: blue necklaces, and an equal number in each group: the cost of each blue necklace. Above which numbers should we put a 2?

Above 4 and 6.

Great! After we find out how much Kate spent on purple necklaces, we need to figure out how much she spent on blue necklaces. Even though the 4 and the 6 are not next to each other, they are the two numbers involved in the second step of solving the problem. They are both about blue necklaces. Pay close attention that you put a 2 above 4 blue necklaces and $6. Go ahead and put a 2 above both of those numbers.

(Writes.)

We don't have any more numbers, but we still have another step. What do we need to do after we find out how much Kate spent on purple necklaces and blue necklaces?

(Responds.)

Exactly! The question asks, "How much money did Kate spend?" After we determine how much Kate spent on purple necklaces and how much Kate spent on blue necklaces, we need to figure out how much Kate spent altogether. So let's put a 3 above our question sentence to remind us we have a third step. Our third step is to combine the money Kate spent on purple necklaces with the money Kate spent on blue necklaces (gesture)**.**

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about today?

Equal Groups, Total, and Difference.

Exactly! We are learning about three-step problems that include the Equal Groups and Total or Difference schemas.

We know which schemas we are working with, but we need to figure out if this problem uses the Equal Groups schema two times and the Total schema or the Equal Groups schema two times and the Difference schema. Also, we need to figure out which schema we need to use first, which schema we need to use second, and which schema we need to use third.

What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Read the questions and gesture with student.

First, Kate bought 3 purple necklaces. Each purple necklace costs $5. We have groups: the purple necklaces, and the number in each group: the cost of each purple necklace (gesture)**. If we have groups with an equal number in each group, which schema are we using?**

Equal Groups.

To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema. What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we find out how much money Kate spent on purple necklaces, we need to find out how much money Kate spent on blue necklaces. We have groups: the number of blue necklaces, with an equal number in each group: the cost of each blue necklace (gesture)**. If we have groups with an equal number in each group, which schema do we need to use second?**

Equal Groups.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

We have one more step. What did we say happened third in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use third.

Read the questions and gesture with student.

After we find out how much money Kate spent on purple necklaces and blue necklaces, we need to find out how much money Kate spent altogether. We have part one: the amount Kate spent on purple necklaces, and part two: the amount Kate spent on blue necklaces (gesture)**. If we are putting parts together, which schema do we need to use third?**

Total.

Nice! To remind me to complete the Total step third, I write 3-T next to the problem. 3 stands for the third step of solving.

Write 3-T.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Equal Groups and Total/ Difference poster.

Point to Equal Groups and Total/Difference equations on the Multi-Step Word-Problem Schema Mat - Version 4.

Let's look carefully at our poster.

Can you look at the two equations and tell me about the schemas?

The first equation on our poster includes the Equal Groups schemas two times and the Total schema. The second equation on our poster includes the Equal Groups schema two times and the Difference schema.

Great! Which schemas are we using in this problem?

Equal Groups, Equal Groups, and Total.

Nice! So which equation do we need to use?

(GR × N) + (GR × N) = ___.

You're right! What's our equation?

Our equation is (GR × N) + (GR × N) = ___.

Good! Let's write it!

Write (GR × N) + (GR × N) = ___.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Equal Groups and Total equation, we can plug in our numbers.

We said our first step was to figure out how much money Kate spent on purple

necklaces. What numbers are talking about purple necklaces?

3 and 5.

Great! Let's put 3 and 5 under the first GR and N.

(Writes.)

Check off 3 and write 3 underneath the first GR.
Check off 5 and write 5 underneath the first N.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the first Equal Groups step.

Check off 1-EG.

We said our second step was to figure out how much money Kate spent on blue necklaces. What numbers are talking about blue necklaces?

4 and 6.

Great! Let's put 4 and 6 under the second GR and N.

(Writes.)

Check off 4 and write 4 underneath the second GR.
Check off 6 and write 6 underneath the second N.

After we check off our numbers, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the second Equal Groups step.

Check off 2-EG.

We said our third step was to figure out how much money Kate spent on purple and blue necklaces. Do we have any more numbers?

No.

Good thinking! We do not have any more numbers, but we know that our last step is to put both parts together. In our equation, we see the plus sign (point)**, which tells us that we are putting parts together or completing the Total step.**

We can put a checkmark next to the 3-T as a reminder that we already have completed the third Total step.

Check off 3-T.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

3×5 and 4×6.

Nice! This time, we have two sets of parentheses. Let's work with the first set of parentheses first and then we will move on to the second set of parentheses.

What's 3×5?

15.

Nice! Let's write 15 under 3×5.

(Writes.)

Now, let's move on to the second set of parentheses. What do you see in the second set of parentheses?

4×6.

Yes! What's 4×6? If you don't know, you can use your Multiplication Table poster.

24.

Nice! Let's write 24 under 4×6.

(Writes.)

Now we need to add our two products to find the total. What do we need to add to make both sides the same?

15 + 24.

What's 15 + 24?

39.

Yes. (3 × 5) + (4 × 6) is the same as 39. Did we balance both of the sides?

Yes.

Nice! Go ahead and write 39.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 39 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Dollars.

We underlined dollars, right here (point)**. We used the word dollars for our label. So, we write dollars after the number 39. You also can write a dollar sign before the number 39.**

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "Kate bought 3 purple necklaces and 4 blue necklaces. Each purple necklace costs $5. Each blue necklace costs $6. How much money did Kate spend?"

Did we answer the question, "How much money did Kate spend?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is dollars.

What word did we underline in our question sentence?

Dollars.

Exactly. We underlined dollars. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this three-step problem using the Equal Groups schema two times and the Total schema! Let's try one more.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem C:*</u>

Ms. Powell orders t-shirts for the 10 students in her class. Tie-Dye t-shirts cost \$5 each. White t-shirts cost \$2 each. How much more will it cost Ms. Powell to buy tie-dye t-shirts than white t-shirts for all of her students?

Problem Type:	*Equal Groups, Equal Groups, and Difference*
Equation:	$(GR \times N) - (GR \times N) = \_\_$
Relevant Information:	$GR = 10; N = 5; GR = 10; N = 2$
Number Sentence:	$(10 \times 5) - (10 \times 2) = \_\_$
Answer:	__ = \$30 (more)

Follow the step-by-step dialogue for an Equal Groups, Equal Groups, and Difference multi-step problem.
Explain to students that this problem is similar to the last problem, but instead of combining the products, we are comparing the products.

*Explain to students that they need to use the 10 students two times to determine how much the tie-dye t-shirts cost and how much the white t-shirts cost (*See dialogue in Lesson 36, Buccaneer Problem A for specific language).*
Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

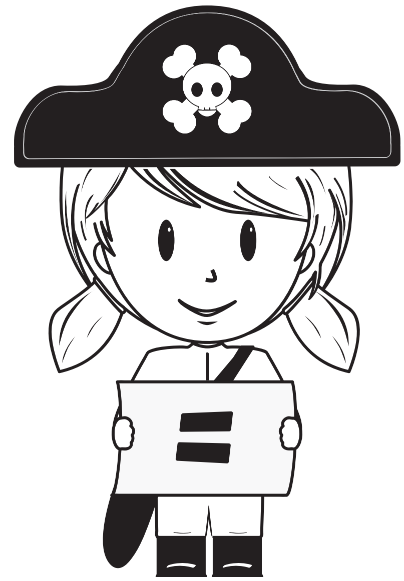
Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 36



ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review

Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 4
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 36
Buccaneer Problems: Lesson 36
Jolly Roger Review: Lesson 36
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, open parentheses 34 plus 34 plus 34 closed parentheses minus 12 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There are two plus signs inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 34 plus 34 plus 34. Why do we need to add 34 plus 34 plus 34 first?

Because there are two plus signs in the parentheses around the 34 plus 34 plus 34. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 34 plus 34 plus 34 first. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. Let's add 34 plus 34 plus 34. What's 34 plus 34 plus 34?

102.

Yes! 34 plus 34 plus 34 is the same as 102. Let's write 102 underneath the 34 plus 34 plus 34.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says minus 12.

Exactly! Let's subtract 102 minus 12. Let's line up our numbers vertically and remember to draw our lines between the ones and tens and tens and hundreds columns. Also, let's circle our sign so we remember to subtract. What is 102 minus 12?

90.

Nice! So, open parentheses 34 plus 34 plus 34 closed parentheses minus 12 is *the same as* what?

90.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, open parentheses 10 times 5 closed parentheses minus open parentheses 10 times 2 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There are two sets of times signs inside the parentheses.

Nice! To solve this problem, we first need to multiply. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 10 times 5. Why do we need to multiply 10 times 5 first?

Because there is a times sign in the parentheses around the 10 times 5. Whatever is in parentheses is what we have to do first. This is the first set of parentheses so we should start here.

Nice! This number sentence looks a lot like the number sentences we saw yesterday when we solved the Buccaneer Problems. Let's work with the first set of parentheses and then we will move on to the second set of parentheses. Let's go ahead and multiply. What's 10 times 5? You can use the Multiplication Table poster to help you out if needed.

50.

Yes! 10 times 5 is the same as 50. Let's write 50 underneath the 10 times 5.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to multiply again.

How do you know?

There is a second set of parentheses around the 10 times 2.

Exactly! Let's move to the second set of parentheses. What is 10 times 2? You can use the Multiplication Table poster to help you out if needed.

20.

Yes! 10 times 2 is the same as 20. Let's write 20 underneath the 10 times 2.

(Writes.)

We are not finished! We have one more step! What do we need to do now?

(Responds.)

Yes! We need to subtract.

How do you know?

There is a minus sign between the two sets of parentheses.

Exactly! We need to subtract. What should we subtract?

(Responds.)

Yes! Let's subtract 50 minus 20. What is 50 minus 20?

30.

Nice! So, open parentheses 10 times 5 closed parentheses minus open parentheses 10 times 2 closed parentheses is *the same as*?

30.

Nice work! Go ahead and write the difference.

(Writes.)

Let's try one more!

Point to C.

Let's read C (point)**. This number sentence says, open parentheses 9 times 2 closed parentheses divided by 3 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 9 times 2. Why do we need to multiply 9 times 2 first?

Because there is a times sign in the parentheses around the 9 times 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 9 times 2 first. What is 9 times 2? You can use the Multiplication Table poster to help you out if needed.

18.

Yes! 9 times 2 is the same as 18. Let's write 18 underneath the 9 times 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to divide.

How do you know?

It says divided by 3.

Exactly! Let's divide 18 by 3. What is 18 divided by 3? You can use the Multiplication Table poster to help you out if needed.

6.

Nice! So, open parentheses 9 times 2 closed parentheses divided by 3 is *the same as* what?

6.

Nice work! Go ahead and write the quotient.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

We have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems that include two steps. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas. We have learned about problems that include the Equal Groups *and* Equal Groups schemas.

Yesterday, we learned about another type of multi-step problem. We learned about multi-step problems that include three schemas! Do you remember which schemas we talked about yesterday?

(Responds.)

You're right! We talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Total schemas. We also talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Difference schemas.

Today, we are going to continue to practice solving more problems.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

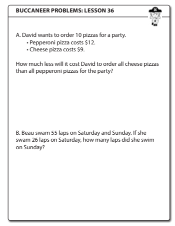
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 36

A. David wants to order 10 pizzas for a party.
- Pepperoni pizza costs $12.
- Cheese pizza costs $9.

How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?

B. Beau swam 55 laps on Saturday and Sunday. If she swam 26 laps on Saturday, how many laps did she swim on Sunday?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

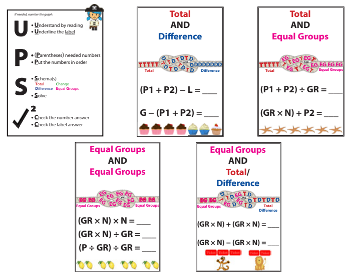
Number it.

<u>Solution to Problem A:</u>

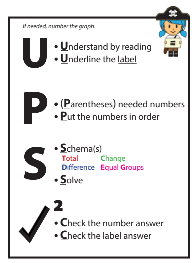
David wants to order 10 pizzas for a party. Pepperoni pizza costs $12. Cheese pizza costs $9. How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?

Problem Type:	*Equal Groups, Equal Groups, and Difference*
Equation:	$(GR \times N) - (GR \times N) = \_\_$
Relevant Information:	$GR = 10; N = 12; GR = 10; N = 9$
Number Sentence:	$(10 \times 12) - (10 \times 9) = \_\_$
Answer:	*__ = $30 (less)*

Display Multi-Step Word-Problem Schema Mat - Version 4.



Point to UPS Check^2 poster on the Multi-Step Word-Problem Schema Mat - Version 4.



There is not a table or graph, so we are ready to follow our UPS Check^2 steps.

To help us remember to use UPS Check^2, let's write the letters in the corner below our problem like this:

U U
P P
S S
✓ ✓

(Writes.)

After we complete a letter, we will check it off to remember that we have completed that step.

Point to the first U.

The first U stands for "Understand by reading." This means we need to read the problem. Let's read the problem together. "David wants to order 10 pizzas for a party. Pepperoni pizza costs $12. Cheese pizza costs $9. How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?"

Let's put a checkmark next to our first U so we know we have completed that step.

(Writes.)

Point to the second U.

The second U stands for, "Underline the label." The label tells us what the problem is mostly about. We underline the label to know which numbers are important and to help label the answer later.

What's this problem about?

(Responds.)

The problem asks us about how much money David will spend. If the question is asking about money, what is a good label?

(Responds.)

Great! Our label is dollars. If we did not know if we were talking about dollars or cents, we could have looked back at our numbers. Our numbers have dollar signs in front of them, so we know we are talking about dollars. Go ahead and write dollars or a dollar sign underneath the question sentence.

(Responds.)

Let's put a checkmark next to our second U so we know we have completed that step.

(Writes.)

Good! After we underline the label, we need to move on to our next step. What is the next letter on our UPS Check^2 poster?

P.

Point to the first P.

The first P stands for, "Put parentheses around needed numbers." Needed numbers are numbers that are about the label, or numbers that are relevant to the problem. To find the needed numbers, we need to check each of the numbers in the problem, one by one, to make sure they are about the label.

Let's check each of the numbers. Our first number is 10. 10 is about pizzas and our label is dollars. David wants to spent money on pizzas, so 10 is relevant. Let's put parentheses around 10 pizzas.

(Writes.)

What is our next number?

12.

Our next number is 12. 12 is about dollars, so 12 is relevant. Let's put parentheses around $12.

(Writes.)

What is our last number?

9.

Our last number is 9. 9 is about dollars, so 9 is relevant. Let's put parentheses around $9.

(Writes.)

All of the numbers in this problem are relevant because they are all about or related to our label, dollars. If there were numbers that were not about our label, they would be considered irrelevant and not needed. In that case, we would cross out those numbers.

Let's put a checkmark next to our first P so we know we have completed that step.

(Writes.)

Point to the second P.

The second P stands for, "Put the numbers in order." For this step, we want to put a 1 above any needed numbers involved in the first step of solving the problem and a 2 above any needed numbers involved in the second step of solving the problem.

Now that we are solving problems with three steps, we will put a 3 above any needed numbers or information involved in the third step of solving the problem.

What do we need to do?

Put a 1 above any needed numbers involved in the first step of solving the problem, a 2 above any needed numbers involved in the second step of solving the problem, and a 3 above any needed numbers that talk about what is happening third.

Because we are working three-step problems, we have to think very carefully about what is happening first in the problem, what is happening second in the problem, and what is happening third in the problem.

What will we put above what happens first?

1.

Nice! And what will we put above what happens second?

2.

And what will we put above numbers that talk about what is happening third?

3.

We will put a 1 above the numbers that talk about what is happening first. We will put a 2 above the numbers that talk about what is happening second. We will put a 3 above the numbers that talk about what is happening third.

Ordering our numbers will help us during our next step, S, when we need to choose our equation and solve the problem!

When we have multi-step problems, it's helpful to re-read the problem to determine how we need to order our numbers.

Let's read the problem together.

The problem says, "David wants to order 10 pizzas for a party. Pepperoni pizza costs $12. Cheese pizza costs $9. How much less will it cost David to order all

cheese pizzas than all pepperoni pizzas for the party?"

In this problem, we have groups: 10 pizzas, and an equal number in each group: the cost of each pepperoni pizza (gesture)**.**

What are the groups?

(Responds.)

What is the number in each group?

(Responds.)

Then, we have groups: the 10 pizzas, and an equal number in each group: the cost of each cheese pizza (gesture)**.**

What are the groups?

(Responds.)

What is the number in each group?

(Responds.)

Lastly, we want to know how much less it will cost David to order all cheese pizzas than all pepperoni pizzas for the party.

What do we want to know?

(Responds.)

This problem is a lot like the second zoo problem we worked yesterday where we had groups with an equal number in each group two times and then we compared two amounts to find the difference.

First, we have groups: 10 pizzas, and an equal number in each group: the cost of each pepperoni pizza. Above which numbers should we put a 1?

Above 10 and 12.

Nice! 10 and 12 are the two numbers involved in the first step of solving the

problem. They are about the number of pizzas and the cost of each pepperoni pizza, or groups with an equal number in each group. Pay close attention that you put a 1 above 10 pizzas and $12. Go ahead and put a 1 above both of those numbers.

(Writes.)

Next, we have groups: 10 pizzas, and an equal number in each group: the cost of each cheese pizza. We put a 1 above 10 pizzas, but 10 pizzas also is involved in the second step of this problem. Do you know why?

(Responds.)

Yes! We want to compare the cost of 10 pepperoni pizzas to the cost of 10 cheese pizzas. 10 is the number of groups for the first *and* second steps of the problem. Above which numbers should we put a 2?

Above 10 and 9.

Great! After we find out the cost of 10 pepperoni pizzas, we need to figure out the cost of 10 cheese pizzas. Even though the 10 and the 9 are not next to each other, they are the two numbers involved in the second step of solving the problem. They are about the number of pizzas and the cost of each cheese pizza, or groups with an equal number in each group. Pay close attention that you put a 2 above 10 pizzas and $9. Go ahead and put a 2 above both of those numbers.

(Writes.)

Now remember, when we start to solve the problem, we will use the 10 two times. That's why we put a 1 and a 2 above the 10. First, we will use the 10 to find out the cost of 10 pepperoni pizzas. Then, we will use the 10 to find out the cost of 10 cheese pizzas.

Why do we need to use the 10 two times?

(Responds.)

We don't have any more numbers, but we still have another step. What do we need to do after we find out the cost of 10 pepperoni pizzas and the cost of 10 cheese pizzas?

(Responds.)

Exactly! The question asks, "How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?" After we determine the cost of 10 pepperoni pizzas and the cost of 10 cheese pizzas, we need to compare the cost of the pepperoni pizzas to the cost of the cheese pizzas. So let's put a 3 above our question sentence to remind us we have a third step. Our third step is to compare the cost of the 10 pepperoni pizzas to the cost of the 10 cheese pizzas (gesture)**.**

(Writes.)

Let's put a checkmark next to our second P so we know we have completed that step.

(Writes.)

Point to the first S.

Now we need to determine the schema(s). What schemas have we been talking about?

Equal Groups, Total, and Difference.

Exactly! We are learning about three-step problems that include the Equal Groups and Total or Difference schemas.

We know which schemas we are working with, but we need to figure out if this problem uses the Equal Groups schema two times and the Total schema or the Equal Groups schema two times and the Difference schema. Also, we need to figure out which schema we need to use first, which schema we need to use second, and which schema we need to use third. What did we say happened first in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use first.

Read the questions and gesture with student.

First, we need to determine the cost of 10 pepperoni pizzas. Each pepperoni pizza costs $12. We have groups: the number of pepperoni pizzas, and the number in each group: the cost of each pepperoni pizza (gesture)**. If we have groups with an equal number in each group, which schema are we using?**

Equal Groups.

To remind me to complete the Equal Groups step first, I write 1-EG next to the problem. 1 stands for the first step of solving.

Write 1-EG.

Now, we can move on to the second schema. What did we say happened second in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which schema we need to use second.

Read the questions and gesture with student.

After we find out the cost of 10 pepperoni pizzas, we need to determine the cost of 10 cheese pizzas. We have groups: the number of cheese pizzas, with an equal number in each group: the cost of each cheese pizza (gesture)**. If we have groups with an equal number in each group, which schema do we need to use second?**

Equal Groups.

Nice! To remind me to complete the Equal Groups step second, I write 2-EG next to the problem. 2 stands for the second step of solving.

Write 2-EG.

We have one more step. What did we say happened third in the problem?

(Responds.)

Let's look at our What Do You Ask Yourself? poster to help us figure out which

schema we need to use third.

Read the questions and gesture with student.

After we find out the cost of 10 pepperoni pizzas and the cost of 10 cheese pizzas, we need to find out how much less it will cost David to order all cheese pizzas than all pepperoni pizzas. We have an amount that's greater: the cost of 10 pepperoni pizzas. We have an amount that's less: the cost of 10 cheese pizzas (gesture)**. If we are comparing two amounts for a difference, which schema do we need to use third?**

Difference.

Nice! To remind me to complete the Difference step third, I write 3-D next to the problem. 3 stands for the third step of solving.

Write 3-D.

Before we can move on to the next step, we need to determine which multi-step equation we need to use. Let's look at our Equal Groups and Total/ Difference poster.

Point to Equal Groups and Total/Difference equations on the Multi-Step Word-Problem Schema Mat - Version 4.

Let's look carefully at the equations on the poster. What are the equations and schemas?

(Responds.)

Good! The first equation on our poster includes the Equal Groups schemas two times and the Total schema (point)**. The second equation on our poster includes the Equal Groups schema two times and the Difference schema** (point)**.**

Which schemas are we using in this problem?

Equal Groups, Equal Groups, and Difference.

Nice! So which equation do we need to use?

$(GR \times N) - (GR \times N) = \_\_$.

You're right! Our equation is (GR × N) – (GR × N) = __. Let's write it!

Write (GR × N) – (GR × N) = __.

Let's put a checkmark next to our first S so we know we have completed that step.

(Writes.)

The second S stands for, "Solve." Now that we know our multi-step Equal Groups and Difference equation, we can plug in our numbers.

We said our first step was to figure out the cost of 10 pepperoni pizzas. What numbers are talking about pepperoni pizzas?

10 and 12.

Great! Let's put 10 and 12 under the first GR and N.

(Writes).

Check off 10 and write 10 underneath the first GR.
Check off 12 and write 12 underneath the first N.

After we check off our numbers, we also can put a checkmark next to the 1-EG as a reminder that we already have completed the first Equal Groups step.

Check off 1-EG.

We said our second step was to figure out the cost of 10 cheese pizzas. What numbers are talking about cheese pizzas?

10 and 9.

Great! Let's put 10 and 9 under the second GR and N.

(Writes).

Check off 10 and write 10 underneath the second GR.
Check off 9 and write 9 underneath the second N.

After we check off our numbers, we also can put a checkmark next to the 2-EG as a reminder that we already have completed the second Equal Groups step.

Check off 2-EG.

We said our third step was to figure out how much less it will cost David to order all cheese pizzas than all pepperoni pizzas. Do we have any more numbers?

No.

Good thinking! We do not have any more numbers, but we know that our last step is to compare the cost of the pepperoni pizzas to the cost of the cheese pizzas. In our equation, we see the minus sign (point)**, which tells us that we are comparing two amounts for a difference or completing the Difference step.**

We can put a checkmark next to the 3-D as a reminder that we already have completed the third Difference step.

Check off 3-D.

Now we are ready to do the math! Remind me, what do the parentheses mean?

Whatever is in parentheses is what we need to do first.

Nice! What do you see in parentheses?

10 × 12 and 10 × 9.

Nice! This time, we have two sets of parentheses. Let's work with the first set of parentheses first and then we will move on to the second set of parentheses.

What's 10 × 12? You can use your Multiplication Table poster to help you out if needed.

120.

Nice! Let's write 120 under 10 × 12.

(Writes.)

Now, let's move on to the second set of parentheses. What do you see in the second set of parentheses?

10×9.

Yes! What's 10×9? If you don't know, you can use your Multiplication Table poster to help you out if needed.

90.

Nice! Let's write 90 under 10×9.

(Writes.)

Now we need to subtract our two products to find the difference. What do we need to subtract?

$120 - 90$.

What's $120 - 90$?

30.

Yes. $(10 \times 12) - (10 \times 9)$ is the same as 30. Did we balance both of the sides?

Yes.

Nice! Go ahead and write 30.

(Writes.)

Whenever we write an answer to a word problem, we need a number and a label. We know that 30 is the number answer, but we still need a label. Think about what the problem is about. Go back to the word we underlined. What did we underline?

Dollars.

We underlined dollars, right here (point)**. We used the word dollars for our label. So, we write dollars after the number 30. You also can write a dollar sign**

before the number 30.

(Writes.)

Let's put a checkmark next to our second S so we know we have completed that step.

(Writes.)

Nice! Now that we have completed our second S step, let's move on.

Point to the first checkmark.

Our first checkmark reminds us that we need to check our number answer to make sure it makes sense. Let's see if the answer makes sense. "David wants to order 10 pizzas for a party. Pepperoni pizza costs $12. Cheese pizza costs $9. How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?"

Did we answer the question, "How much less will it cost David to order all cheese pizzas than all pepperoni pizzas for the party?"

Yes.

Review steps and gesture with student to review why the number answer makes sense.

Let's put a checkmark next to our first checkmark so we know we have completed that step.

(Writes.)

Excellent! Now let's move to our second checkmark.

Point to the second checkmark.

Our second checkmark reminds us that we need to check our label answer to make sure it makes sense. Our label answer is dollars.

What word did we underline in our question sentence?

Dollars.

Exactly. We underlined dollars. The label matches the label we underlined in the question sentence, so we know the label answer also makes sense.

Let's put a checkmark next to our second checkmark so we know we have completed that step.

(Writes.)

Great job solving this three-step problem using the Equal Groups schema two times and the Difference schema! Let's try another one.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>*Solution to Problem B:*</u>

Beau swam 55 laps on Saturday and Sunday. If she swam 26 laps on Saturday, how many laps did she swim on Sunday?

Problem Type:	*Total*
Equation:	*P1 + P2 = T*
Relevant Information:	*P1 = 26; P2 = __; T = 55*
Number Sentence:	*26 + __ = 55*
Answer:	*__ = 29 laps*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

There are 4 drinks in a carton. There are 2 cartons of drinks in a case. How many drinks are in 4 cases?

Problem Type:	*Equal Groups and Equal Groups*
Equation:	$(GR \times N) \times N =$ __
Relevant Information:	$GR = 2; N = 4; N = 4$
Number Sentence:	$(2 \times 4) \times 4 =$ __
Answer:	__ $= 32$ *drinks*

Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

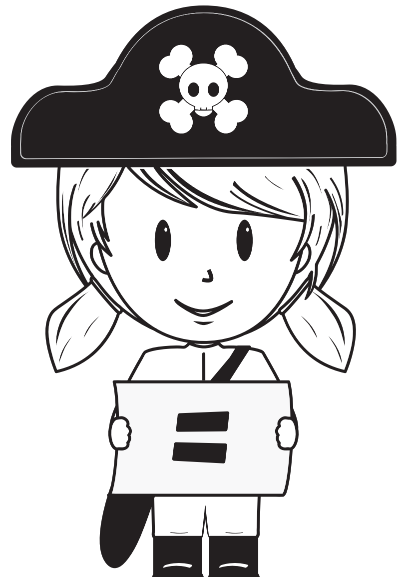
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 37

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 4
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 37
Buccaneer Problems: Lesson 37
Jolly Roger Review: Lesson 37
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, open parentheses 3 times 11 closed parentheses times 10 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply the numbers in parentheses. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 3 times 11. Why do we need to multiply 3 times 11 first?

Because there is a times sign in the parentheses around the 3 times 11. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 3 times 11 first. Let's go ahead and multiply. What's 3 times 11? You can use the Multiplication Table poster to help you out if needed.

33.

Yes! 3 times 11 is the same as 33. Let's write 33 underneath the 3 times 11.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to multiply again.

How do you know?

It says times 10.

Exactly! Let's multiply 33 times 10. When we multiply by 10, we can add a 0 to our number to find the product. What is 33 times 10?

330.

Nice! So, open parentheses 3 times 11 closed parentheses times 10 is *the same as* what?

330.

Nice work! Go ahead and write the product.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, open parentheses 60 plus 40 closed parentheses divided by 5 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 60 plus 40. Why do we need to add 60 plus 40 first?

Because there is a plus sign in the parentheses around the 60 plus 40. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 60 plus 40 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What's 60 plus 40?

100.

Yes! 60 plus 40 is the same as 100. Let's write 100 underneath the 60 plus 40.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to divide.

How do you know?

It says divided by 5.

Exactly! Let's divide 100 by 5. What is 100 divided by 5?

20.

Nice! So, open parentheses 60 plus 40 closed parentheses divided by 5 is *the same as* what?

20.

Nice work! Go ahead and write the quotient.

(Writes.)

Let's try one more!

Point to C.

Let's read C (point)**. This number sentence says, 90 minus open parentheses 15 plus 14 plus 1 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Even though we have 3 numbers in parentheses, we still solve this problem using the order of operations. What do we need to do first?

Add.

How do you know?

There are two plus signs inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 15 plus 14 plus 1. Why do we need to add 15 plus 14 plus 1 first?

Because there are two plus signs in the parentheses around the 15 plus 14 plus 1. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 15 plus 14 plus 1 first. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What's 15 plus 14 plus 1?

30.

Yes! 15 plus 14 plus 1 is the same as 30. Let's write 30 underneath the 15 plus 14 plus 1.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says 90 minus.

Exactly! Let's subtract 90 minus 30. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to subtract. What is 90 minus 30?

60.

Nice! So, 90 minus open parentheses 15 plus 14 plus 1 closed parentheses is *the same as* what?

60.

Nice work! Go ahead and write the difference.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate

Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

We have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems that include two steps. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas. We have learned about problems that include the Equal Groups *and* Equal Groups schemas.

Recently we talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Total schemas. We also talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Difference schemas.

Today, we are going to continue to practice solving single- and multi-step problems.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

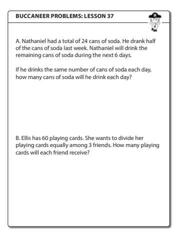
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 37

A. Nathaniel had a total of 24 cans of soda. He drank half of the cans of soda last week. Nathaniel will drink the remaining cans of soda during the next 6 days.

If he drinks the same number of cans of soda each day, how many cans of soda will he drink each day?

B. Ellis has 60 playing cards. She wants to divide her playing cards equally among 3 friends. How many playing cards will each friend receive?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem A:

Nathaniel had a total of 24 cans of soda. He drank half of the cans of soda last week. Nathaniel will drink the remaining cans of soda during the next 6 days. If he drinks the same number of cans of soda each day, how many cans of soda will he drink each day?

Problem Type: *Equal Groups and Equal Groups*

Equation: *(P ÷ GR) ÷ GR = __*
Relevant Information: *P = 24; GR = 2; GR = 6*
Number Sentence: *(24 ÷ 2) ÷ 6 = __*
Answer: *__ = 2 sodas*

Follow the step-by-step dialogue for an Equal Groups and Equal Groups multi-step problem.
Continue to use Multiplication Table poster as needed.
Review that half means we need to divide by 2.

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

Ellis has 60 playing cards. She wants to divide her playing cards equally among 3 friends. How many playing cards will each friend receive?
Problem Type: *Equal Groups*
Equation: *P ÷ GR = N*
Relevant Information: *P = 60; GR = 3; N = __*
Number Sentence: *60 ÷ 3 = __*
Answer: *__ = 20 playing cards*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

Yes.

You're right. There is a table, but the table already is numbered so we can go ahead and follow our UPS Check^2 steps.

Solution to Problem C:

The table below shows the amount of money Rob earned for completing chores. How much more money did Rob earn from sweeping the garage, washing the car, and weeding the garden than from cleaning tools?

Problem Type:	*Total and Difference*
Equation:	*(P1 + P2 + P3) – L = __*
Relevant Information:	*P1 = 1.50; P2 = 1.75; P3= 11.00; L = 4.50*
Irrelevant Information:	*~~Raking the yard~~*
Number Sentence:	*(1.50 + 1.75 + 11.00) – 4.50 = __*
Answer:	*__ = $9.75*

Follow the step-by-step dialogue for a Total and Difference multi-step problem. Remind students that the combined amount is the amount that's greater, so we need to use the equation (P1 + P2) – L = __.
Explain to students that we have a third part, so we need to add P3 to the equation.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your

Treasure Map.

Count coins.

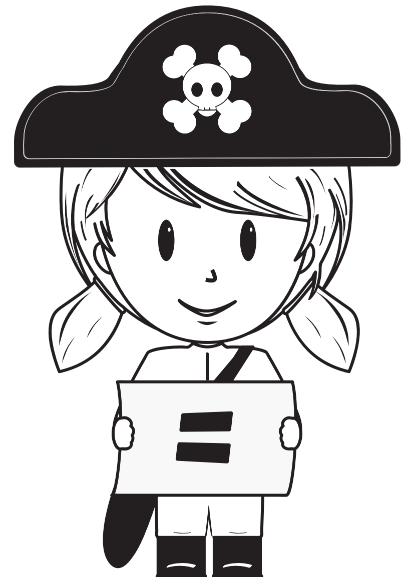
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 38

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 4
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 38
Buccaneer Problems: Lesson 38
Jolly Roger Review: Lesson 38
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, open parentheses 20 times 2 closed parentheses times 10 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply the numbers in parentheses. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 20 times 2. Why do we need to multiply 20 times 2 first?

Because there is a times sign in the parentheses around the 20 times 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 20 times 2 first. Let's go ahead and multiply. What's 20 times 2? You can count by 20's two times if needed.

40.

Yes! 20 times 2 is the same as 40. Let's write 40 underneath the 20 times 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to multiply again.

How do you know?

It says times 10.

Exactly! Let's multiply 40 times 10. When we multiply by 10, we can add a 0 to our number to find the product. What is 40 times 10?

400.

Nice! So, open parentheses 20 times 2 closed parentheses times 10 is *the same as* what?

400.

Nice work! Go ahead and write the product.

(Writes.)

Let's try another one.

Point to B.

Let's read B (point)**. This number sentence says, open parentheses 132 plus 48 closed parentheses divided by 3 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 132 plus 48. Why do we need to add 132 plus 48 first?

Because there is a plus sign in the parentheses around the 132 plus 48. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 132 plus 48 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns and the tens and hundreds columns. Also, let's circle our sign so we remember to add. What's 132 plus 48?

180.

Yes! 132 plus 48 is the same as 180. Let's write 180 underneath the 132 plus 48.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to divide.

How do you know?

It says divided by 3.

Exactly! Let's divide 180 by 3. What is 180 divided by 3? If you don't know, you can divide 18 by 3 and then add a 0 at the end of the number.

60.

Nice! So, open parentheses 132 plus 48 closed parentheses divided by 3 is *the same as* what?

60.

Nice work! Go ahead and write the quotient.

(Writes.)

Let's try one more!

Point to C.

Let's read C (point)**. This number sentence says, 100 minus open parentheses 55 plus 40 plus 5 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Even though we have 3 numbers in parentheses, we still solve this problem using the order of operations. What do we need to do first?

Add.

How do you know?

There are two plus signs inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 55 plus 40 plus 5. Why do we need to add 55 plus 40 plus 5 first?

Because there are two plus signs in the parentheses around the 55 plus 40 plus 5. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 55 plus 40 plus 5 first. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What's 55 plus 40 plus 5?

100.

Yes! 55 plus 40 plus 5 is the same as 100. Let's write 100 underneath the 55 plus 40 plus 5.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says 100 minus.

Exactly! Let's subtract 100 minus 100. We can do this problem in our heads. What is 100 minus 100?

0.

Nice! So, 100 minus open parentheses 55 plus 40 plus 5 closed parentheses is *the same as* what?

0.

Nice work! Go ahead and write the difference.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

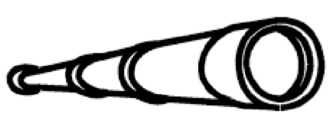
After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!



3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when

you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

We have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems that include two steps. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas. We have learned about problems that include the Equal Groups *and* Equal Groups schemas.

Recently we talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Total schemas. We also talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Difference schemas.

Today, we are going to continue to practice solving single- and multi-step problems.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

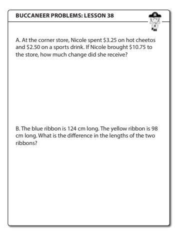
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 38

A. At the corner store, Nicole spent $3.25 on hot cheetos and $2.50 on a sports drink. If Nicole brought $10.75 to the store, how much change did she receive?

B. The blue ribbon is 124 cm long. The yellow ribbon is 98 cm long. What is the difference in the lengths of the two ribbons?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem A:</u>

At the corner store, Nicole spent $3.25 on hot cheetos and $2.50 on a sports drink. If Nicole brought $10.75 to the store, how much change did she receive?
Problem Type: Total and Difference

Equation: *G – (P1 + P2) = __*
Relevant Information: *G = 10.75; P1 = 3.25; P2 = 2.50*
Number Sentence: *10.75 – (3.25 + 2.50) = __*
Answer: *__ = $5*

Follow the step-by-step dialogue for a Total and Difference multi-step problem. Review with student that the combined amount is the amount that's less, so we need to use the equation G – (P1 + P2) = __.
**Note: student may solve this problem as a double Change problem with 2 decreases if desired.*

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

The blue ribbon is 124 cm long. The yellow ribbon is 98 cm long. What is the difference in the lengths of the two ribbons?
Problem Type: *Difference*
Equation: *G – L = D*
Relevant Information: *G = 124; L = 98; N = __*
Number Sentence: *124 – 98 = __*
Answer: *__ = 26 cm*

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem C:</u>

The ballerinas earned $120 for their first performance and $180 for their second performance. The money was divided equally among the 5 ballerinas. How much did each ballerina receive?

Problem Type:	*Total and Equal Groups*
Equation:	*(P1 + P2) ÷ GR = __*
Relevant Information:	*P1 = 120; P2 = 180; GR= 5*
Number Sentence:	*(120 + 180) ÷ 5 = __*
Answer:	*__ = $60*

Follow the step-by-step dialogue for a Total and Equal Groups multi-step problem.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

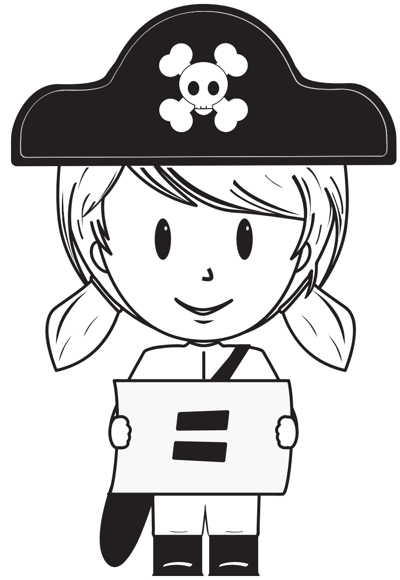
Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!

Lesson 39

ACTIVITIES

1. Captain Cards
2. Equation Quest
3. Buccaneer Problems
   Single- and multi-step problems
4. Shipshape Sorting
5. Jolly Roger Review



Materials

Posters

Multiplication Table
What Do You Ask Yourself?
Multi-Step Word-Problem Schema Mat - Version 4
Large Schema Mat - Version 4

Student Materials

Equation Quest: Lesson 39
Buccaneer Problems: Lesson 39
Jolly Roger Review: Lesson 39
Treasure Map

Tutor Materials

Captain Cards
Timer
Sorting Cards
Sorting Mat
Gold coins
Treasure box

1: Captain Cards

Follow dialogue presented in Lesson 1.

2: Equation Quest

Let's get started with our Equation Quest! What does the equal sign mean?

The same as.

That's right. The equal sign means *the same as* (point)**.**

Today we are going to continue to solve problems using the order of operations. We talked about the order of operations yesterday. Do you remember the order of operations?

(Responds.)

Nice! Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Let's review again. What is the order of operations?

Parentheses come first. Then, we do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Great! Let's solve some problems!

Point to A.

Let's read A (point)**. This number sentence says, open parentheses 250 plus 50 closed parentheses divided by 10 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Add.

How do you know?

There is a plus sign inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 250 plus 50. Why do we need to add 250 plus 50 first?

Because there is a plus sign in the parentheses around the 250 plus 50. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 250 plus 50 first. Let's go ahead and add. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns and the tens and hundreds columns. Also, let's circle our sign so we remember to add. What's 250 plus 50?

300.

Yes! 250 plus 50 is the same as 300. Let's write 300 underneath the 250 plus 50.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to divide.

How do you know?

It says divided by 10.

Exactly! Let's divide 300 by 10. What is 300 divided by 10? When we divide by 10, we can cross out one 0 at the end of our number.

30.

Nice! So, open parentheses 250 plus 50 closed parentheses divided by 10 is *the same as* what?

30.

Nice work! Go ahead and write the quotient.

(Writes.)

Let's try one more!

Point to B.

Let's read B (point)**. This number sentence says, 96 minus open parentheses 4 plus 32 plus 8 closed parentheses is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

Even though we have 3 numbers in parentheses, we still solve this problem using the order of operations. What do we need to do first?

Add.

How do you know?

There are two plus signs inside the parentheses.

Nice! To solve this problem, we first need to add. What do we need to add?

(Responds.)

Exactly! We need to add 4 plus 32 plus 8. Why do we need to add 4 plus 32 plus 8 first?

Because there are two plus signs in the parentheses around the 4 plus 32 plus 8. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to add 4 plus 32 plus 8 first. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to add. What's 4 plus 32 plus 8?

44.

Yes! 4 plus 32 plus 8 is the same as 44. Let's write 44 underneath the 4 plus 32 plus 8.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to subtract.

How do you know?

It says 96 minus.

Exactly! Let's subtract 96 minus 44. Let's line up our numbers vertically and remember to draw our lines between the ones and tens columns. Also, let's circle our sign so we remember to subtract. What is 96 minus 44?

52.

Nice! So, 96 minus open parentheses 4 plus 32 plus 8 closed parentheses is *the same as* what?

52.

Nice work! Go ahead and write the difference.

(Writes.)

Point to C.

Let's read C (point)**. This number sentence says, open parentheses 60 times 2 closed parentheses times 1 is *the same as*** (point to =) **blank. Go ahead and read the number sentence.**

(Reads.)

What do we need to do first?

Multiply.

How do you know?

There is a times sign inside the parentheses.

Nice! To solve this problem, we first need to multiply the numbers in parentheses. What do we need to multiply?

(Responds.)

Exactly! We need to multiply 60 times 2. Why do we need to multiply 60 times 2 first?

Because there is a times sign in the parentheses around the 60 times 2. Whatever is in parentheses is what we have to do first.

Nice! Parentheses come first in the order of operations, so we need to multiply 60 times 2 first. Let's go ahead and multiply. What's 60 times 2?

120.

Yes! 60 times 2 is the same as 120. Let's write 120 underneath the 60 times 2.

(Writes.)

What do we need to do second?

(Responds.)

Yes! We need to multiply again.

How do you know?

It says times 1.

Exactly! Let's multiply 120 times 1. What is 120 times 1?

120.

Nice! Any number times itself is that number. So, open parentheses 60 times 2 closed parentheses times 1 is *the same as* what?

120.

Nice work! Go ahead and write the product.

(Writes.)

Remind me, what does the equal sign mean?

The same as.

What do we need to do whenever we see the equal sign?

Balance both of the sides of the equation.

And what do parentheses mean?

Parentheses come first in the order of operations. Whatever is in parentheses is what we need to do first.

After parentheses, what comes next in the order of operations?

We do all the multiplication and division, left to right in the problem. Then, we do all the addition and subtraction, left to right in the problem.

Nice! And how do we always solve a problem?

From left to right.

Exactly! Nice job with Equation Quest today!

3: Buccaneer Problems

Before we get started today, let's talk about when you solve word problems. We solve word problems when we meet. When else do you solve word problems?

(Responds.)

That's right! You solve word problems with your math teacher in class, when you take a test, and when you do your homework. It's important to use your Pirate Math Equation Quest skills whenever you solve a word problem. Pirate Math Equation Quest can help you solve any word problem!

When can you use your Pirate Math Equation Quest skills?

(Responds.)

That's right! Be sure to use your Pirate Math Equation Quest skills when you see a word problem anywhere!

We have learned four schemas. Can you tell me the four schemas we have learned?

(Responds.)

We have learned about Total, Difference, Change, and Equal Groups schemas.

We also have talked about multi-step problems that include two steps. Which schema combinations have we learned about for multi-step problems?

(Responds.)

Exactly! We have talked about problems that include the Total *and* Difference schemas. We also have talked about problems that include the Total *and* Equal Groups schemas. We have learned about problems that include the Equal Groups *and* Equal Groups schemas.

Recently we talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Total schemas. We also talked about three-step problems that include the Equal Groups *and* Equal Groups *and* Difference schemas.

Today, we are going to continue to practice solving single- and multi-step problems.

Before we get started, let's review.

Whenever we see a word problem, what do we need to do?

Check for a table or a graph.

If we see a table or a graph, what do we always do first?

Number it before we read the word problem.

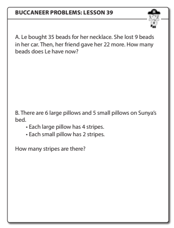
Yes. We always have to check if the word problem has a table or a graph. Whenever we see a table or graph, we number it before we read the word problem.

And, when we solve word problems, what two things do we need in our answer?

A number and a label.

Very good.

Point to A.


BUCCANEER PROBLEMS: LESSON 39

A. Le bought 35 beads for her necklace. She lost 9 beads in her car. Then, her friend gave her 22 more. How many beads does Le have now?

B. There are 6 large pillows and 5 small pillows on Sunya's bed.

- Each large pillow has 4 stripes.
- Each small pillow has 2 stripes.

How many stripes are there?

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

<u>Solution to Problem A:</u>

Le bought 35 beads for her necklace. She lost 9 beads in her car. Then, her friend gave her 22 more. How many beads does Le have now?

Problem Type:	*Change decrease, increase (double Change)*
Equation:	*ST – C + C = __*
Relevant Information:	*ST = 35; C = – 9; C = + 22*
Number Sentence:	*35 – 9 + 22 = __*
Answer:	*__ = 48 beads*

Point to B.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem B:

There are 6 large pillows and 5 small pillows on Sunya's bed. Each large pillow has 4 stripes. Each small pillow has 2 stripes. How many stripes are there?

Problem Type:	*Equal Groups, Equal Groups, and Total*
Equation:	$(GR \times N) + (GR \times N) = \_\_$
Relevant Information:	$GR = 6; N = 4; GR = 5; N = 2$
Number Sentence:	$(6 \times 4) + (5 \times 2) = \_\_$
Answer:	$\_\_ = 34$ *stripes*

Follow the step-by-step dialogue for an Equal Groups, Equal Groups, and Total multi-step problem.
Continue to use Multiplication Table poster as needed.

Point to C.

Whenever we see a word problem, what do we need to check for?

A table or a graph.

Do you see a table or a graph?

No.

If you did see a table or a graph, what would you do?

Number it.

Solution to Problem C:

Mason bought 12 cookies that were \$4 each. He also bought a cake for \$18.50. What was the total amount Mason paid for the cookies and cake?

Problem Type:	*Total and Equal Groups*
Equation:	$(GR \times N) + P2 = \_\_$
Relevant Information:	$GR = 12; N = 4; P2 = 18.50$
Number Sentence:	$(12 \times 4) + 18.50 = \_\_$
Answer:	$\_\_ = \$66.50$

Follow the step-by-step dialogue for Total and Equal Groups multi-step problem. Continue to use Multiplication Table poster as needed.

4: Shipshape Sorting

Follow dialogue presented in Lesson 3.

Nice work with Shipshape Sorting!

You earn a treasure coin!

5: Jolly Roger Review

Follow dialogue presented in Lesson 1.

Treasure Map

Let's count the number of coins you earned today and mark them on your Treasure Map.

Count coins.

Go ahead and color __ places on your Treasure Map! (Student colors.)

Remember, once you fill up your Treasure Map, you'll choose a prize out of the treasure box!