PIRATE MATH
SECONDARY PREVENTION

WORD-PROBLEM SOLVING INTERVENTION AT SECOND GRADE

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Dear Educator,

Thank you for your interest in the Pirate Math Word-Problem Solving Intervention Program at Second Grade. This Pirate Math small group tutoring program was developed at and is sole sourced by Vanderbilt University. We are pleased to offer you this excerpt to review.

These pages from the Pirate Math tutoring intervention manual are provided as a courtesy to allow you to preview a representative sampling of the Pirate Math Tutoring Program at 2nd Grade. This excerpt includes the following:

1. Table of Contents
2. Introduction
3. Lesson 5 – Total problems
4. Lesson 17 - Difference problems
5. Lesson 29 – Change problems
6. Supplemental Materials
   a. Attendance Log
   b. PM Worksheets for days 5, 17, and 29
   c. Pirate Problems for days 5, 17 and 29
   d. Teacher Posters
   e. Treasure Maps

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If you would like to place an order for Pirate Math Word-Problem Solving Intervention Program at Second grade, please call 615-343-4782 for an order form or visit our website at http://vkc.mc.vanderbilt.edu/pals. You may also visit our secure on-line portal at http://vkc.mc.vanderbilt.edu/palsorder/catpick?pay=1 to make a purchase with your credit card.

Thank you for your interest in Pirate Math.

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Pirate Math

Word-Problem Solving Program at Second Grade

TUTOR MANUAL
Small-Group Instruction

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Table of Contents

Activity Guides

Introduction

Welcome to **Pirate Math**! Pirate Math comprises whole-class (Tier 1 or primary prevention) and small-group (Tier 2 or secondary prevention) levels of word-problem instruction for use with students at the second-grade instructional level. The focus of Pirate Math is single-digit and double-digit word problems of three types: *Total* problems (where parts are combined to result in a total), *Difference* problems (where quantities are compared to result in a difference), and *Change* problems (where an event happens to change a starting amount, which results in an ending amount).

This manual and supplemental materials packet contains the tutor lessons and student materials necessary to implement **Pirate Math Small-Group Intervention**. This tutoring program is designed for students at-risk for difficulty with the Pirate Math Whole-Class Instruction program. A separate manual contains the teacher lessons and student materials for conducting Pirate Math Whole-Class Instruction, which is designed for not-at-risk as well as at-risk students.

Scientific evaluations of Pirate Math indicate that not-at-risk and at-risk second-grade students make greater progress on word problems when they receive Pirate Math compared to students who do not participate in Pirate Math. For examples of studies, see:

Fuchs, L. S., Powell, S. R., Cirino, P. T., Schumacher, R. F., Marrin, S., Hamlett, C. L., … Changas, P. C. (2014). Does calculation or word-problem instruction provide a stronger route to pre-algebraic knowledge? *Journal of Educational Psychology, 106*, 990-1006. doi:10.1037/a0036793

Powell, S. R., Fuchs, L. S., Cirino, P. T., Fuchs, D., Compton, D. L., & Changas, P. C. (in press). Effects of a multitier support system on calculation, word problem, and pre algebraic learning among at-risk learners. *Exceptional Children*. doi:10.1177/0014402914563702
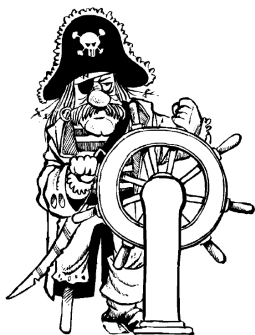
In This Manual

The Pirate Math Small-Group Intervention program is presented in two sets: (1) Tutor Manual and (2) Supplemental Materials Packet.

This **Tutor Manual** contains the following:

Introduction
- Basic information about implementing Pirate Math
- Schedule for implementation
- List of materials and how to copy materials

Lesson Guides 1-39
- Tutor lessons

Activity Guides
- Guides to core lesson components (tutors are referred to Activity Guides in the lessons)

The **Supplemental Materials Packet** contains the following:

Student Worksheets
- Copy 1 sheet (front-to-back) for each student

Pirate Problems
- Copy 1 half-sheet (front-to-back) for each student

Posters/Cards
- Copy 1 poster for each teacher
- Copy 1 card for each student

Treasure Maps
- Copy 1 for each student
- Replenish throughout tutoring

Mats and Games
- Copy as necessary

Flash Cards
- Copy 1 set for group
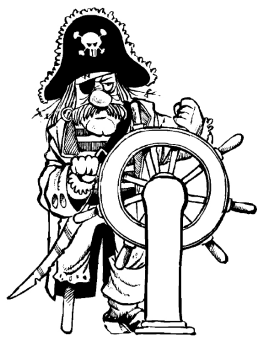
Implementation

Pirate Math Small-Group Intervention is conducted **three times** each week for **13 school weeks**. Each session lasts **30 minutes.**

Pirate Math Small-Group Intervention should occur concurrent with Pirate Math Whole-Class Intervention.

During each session, the tutor teaches a lesson to the students. Tutors could be mathematics specialists, special education teachers, or anyone capable of delivery of the intervention.

Daily Activities

Tutor Lesson (20 minutes)
- Tutor teaches a lesson to the small group.
- Lesson may include a game.
- Lesson includes instruction on solving word problems.

Sorting Game (5 minutes)
- Occurs Days 13-39.
- Tutor asks students to sort 10 word problems by problem type.
- Tutor reviews incorrectly sorted cards.

Pirate Problems (5 minutes)
- Each student works individually on a Pirate Problems sheet.
- Students solve for *X* for 2 minutes and solve a word problem for 2 minutes.
- When students finish, the tutor checks each student's work and reviews incorrectly answered problems.
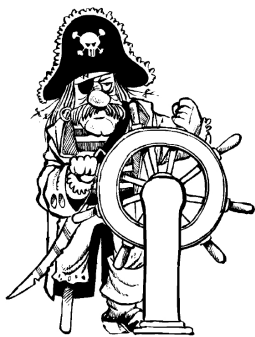
Schedule

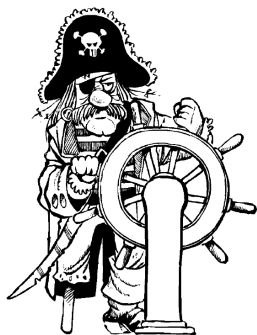|	TUTOR LESSON
1	Review finding X
2	Finding X
3	Finding X
4	Find X Flash Cards; Review Total problems (T as X); Total Game
5	Find X Flash Cards; Total problems (T as X); Total Game
6	Find X Flash Cards; Total problems (T as X); Total Game
7	Find X Flash Cards; Total problems (T as X); Total Game
8	Find X Flash Cards; Total problems (P1 and P2 as X); Total Game
9	Find X Flash Cards; Total problems; Total Game
10	Find X Flash Cards; Total problems; Total Game
11	Find X Flash Cards; Total problems; Total Game
12	Find X Flash Cards; Total problems; Total Game
13	Find X Flash Cards; Total problems; Total Game
14	Difference Game; Review Difference problems (D as X); Sorting Game
15	Difference Game; Difference problems (D as X); Sorting Game
16	Difference Game; Difference problems (D as X); Sorting Game
17	Difference Game; Difference problems (D as X); Sorting Game
18	Difference Game; Difference problems (B and s as X); Sorting Game
19	Difference Game; Difference problems; Sorting Game
20	Difference Game; Difference problems; Sorting Game
21	Difference Game; Difference problems; Sorting Game
22	Difference Game; Difference problems; Sorting Game
23	Difference Game; Review problems; Sorting Game
24	Difference Game; Review problems; Sorting Game
25	Difference Game; Review problems; Sorting Game
26	Difference Game; Review problems; Sorting Game
27	Find X Flash Cards; Change problems (E as X); Sorting Game
28	Difference Game; Change problems (E as X); Sorting Game
29	Find X Flash Cards; Change problems (E as X); Sorting Game
30	More Sentence Game; Review problems; Sorting Game
31	Find X Flash Cards; Change problems (ST as X); Sorting Game
32	More Sentence Game; Change problems (ST as X); Sorting Game
33	Find X Flash Cards; Change problems (C as X); Sorting Game
34	More Sentence Game; Change problems; Sorting Game
35	Find X Flash Cards; Change problems; Sorting Game
36	More Sentence Game; Change problems; Sorting Game
37	Find X Flash Cards; Review problems; Sorting Game
38	More Sentence Game; Review problems; Sorting Game
39	Difference Game; Review problems; Sorting Game

Tutor Materials

During each lesson, the tutor uses a lesson guide to lead the lesson. The **Lesson Guides** are in this Tutor Manual. The guides are presented in order from Lesson 1 to Lesson 39. These guides should be reviewed before delivery of the lesson. *The guides should not be read verbatim*.

This Lesson Guide is from Lesson 28. The first page provides a list of activities and necessary materials. The tutor's dialogue is presented in **bold.**

Lesson 28

Today's Activities:
1. Difference Game
2. Lesson
       Change
3. Sorting Game
4. Pirate Problems

MATERIALS

Posters:
Find X! Poster   RUN! Poster
Change Poster

Materials:
Timers (2)   Treasure Chest
Dry Erase Marker   Pencils
Dry Erase Board   Colored Pencils
Greater Gator Cards   Highlighters
Greater Than/Less Than Cards   Sorting Mat
Sorting Cards   Sorting Graph

Worksheets:
Attendance Log   Difference Game Worksheet
Treasure Maps   More Sentence Worksheet
PM Worksheet 28   Pirate Problems 28
Equation Worksheet

TUTOR LESSON

Let's get started on *Pirate Math*.

(Set timer, without student noticing, using the guide on the Attendance Log to determine the amount of time. Award checks as appropriate. Repeat.)

DIFFERENCE GAME

Follow Activity Guide: Difference Game

Pirate Math Day 28 - 449

Many Lessons refer to an **Activity Guide.** The Activity Guides are located in this Tutor Manual, after the lesson guides. The Activity Guides provide a shortcut to information about each activity that occurs during a lesson.

Activity Guide: Change

(Student), what's Step 1?

Write ST + C = E or ST – C = E.

Good. We need to write ST + C = E or ST – C = E. In this problem, do we write a plus or minus sign?

Student.

Good. Go ahead and write the Change equation now.

Monitor that students write ST +C = E or ST – C = E.

(Student), what does Step 2 say?

What's ST?

Yes. Step 2 says: "What's ST?" (Point.) **We decide the starting amount. Sometimes the problem tells us the start amount. Other times, the start amount is X. Look at the problem. What's the Start amount?**

If ST is a number:
Right. This problem tells us the start amount is ___. We check off __ in the problem and write it under ST. Do that now.

Monitor that student checks off __ in the problem/graph and writes it under ST.

If ST is missing:
Yes. This problem doesn't tell us the start amount. That's what's missing. We have to find ST. Where should we mark X?

Underneath ST.

Good. Do that now.

Monitor that student writes X under ST.

Activity Guide: Change - 611

RUN!

1. *Read* the problem.

2. *Underline* the labels.

3. *Name* the problem type.

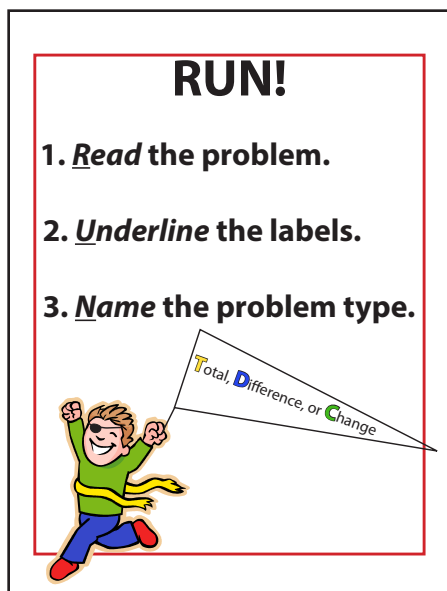*Total, Difference, or Change*

During some lessons, tutor may show **Posters**. These posters are located in the Supplemental Materials.

Any **Games, Mats,** or **Flash Cards** are also located in the Supplemental Materials.

Sorting Mat

T

C

D
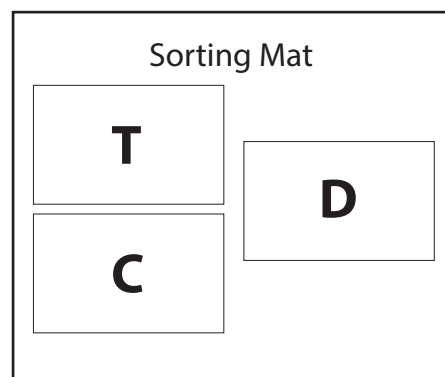
Pirate Math Tutoring Attendance Log

DAY 1 Date				Notes
During introduction				
5 minutes				
8 minutes				
Student worksheet: - Student wrote "X=5" for Problem A.				
Student worksheet: - Student wrote "X=3" for Problem D.				
Student worksheet: - Student wrote "X=3" for Problem F.				
Pirate Problems: Solved at least 3 correct algebraic equations.				
Length of tutoring session, rounded to nearest minute. (Write "A" if absent.)				
DAY 2 Date				Notes
3 minutes				
4 minutes				
9 minutes				
Student worksheet: - Student wrote "X = 7" for Problem E.				
Student worksheet: - Student wrote "X = 8" for Problem F.				
Student worksheet: - Student wrote "X = 6" for Problem I.				
Pirate Problems: Solved at least 3 correct algebraic equations.				
Length of tutoring session, rounded to nearest minute. (Write "A" if absent.)				

During each lesson, students have the opportunity to earn points by following directions, being on task, and answering questions correctly. The tutor tracks points on the **Attendance Log**. The logs are located in the Supplemental Materials.

Student Materials

Here are sample materials used during each lesson.

Each student has a copy of the **Worksheet**. The Worksheet is a full-sheet copied front-to-back. Students write their work on their paper.

Pirate Math Worksheet Day 28

A. Last week, Erika played in 1 basketball game. Then, her coach asked her to play in 3 more basketball games. How many basketball games has Erika played in now?

B. Alan had 3 video games. Then, he got 2 more video games and 1 soccer ball for his birthday. How many video games does Alan have now?

NAME:_____ PIRATE PROBLEMS - DAY 28

2 + 7 = X	X − 4 = 3	2 + X = 8
X = ___	X = ___	X = ___
10 − X = 6	X + 3 = 6	8 − 5 = X
X = ___	X = ___	X = ___
X + 4 = 8	10 − X = 9	10 − 4 = X
X = ___	X = ___	X = ___

The final activity each day is **Pirate Problems**. Pirate Problems is a half-sheet copied front-to-back. Each student writes their work on their own paper.

Carrie had $5. Then her aunt gave her another $4 for her birthday. How much money does she have now?

PIRATE PROBLEMS - DAY 28

Pirate Math Treasure Map

Name:
_____

Each student graphs their daily score from the Attendance Log on a **Pirate Math Treasure Map.** When a student fills their map, the student selects a small prize from a treasure box. (The treasure box is not included with this manual. Teachers should create a treasure box with prizes such as pencils, stickers, candy, etc.)

Students use **Cards** during Pirate Math. Cards are located in the Supplemental Materials.

Find X!

Is **X** at the end?

Solve it!
$2 + 3 = $ **X**
$5 - 2 = $ **X**

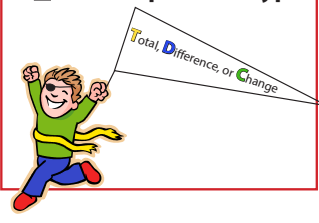Is it **X –** ?

Add
X $- 2 = 3$

Otherwise:

Subtract
X $+ 2 = 5$
$3 + $ **X** $= 5$
$5 - $ **X** $= 3$

The **Find X! Card** helps students solve for an unknown.

RUN!

1. *Read* the problem.

2. *Underline* the labels.

3. *Name* the problem type.

Total, Difference, or Change

The **RUN! Card** provides prompts for solving a word problem.

TOTAL

1. Write P1 + P2 = T

2. What's T?

3. What's P1 and P2?

4. Write the signs.

5. Find X!

P1 + P2 = T

In a Total problem, parts (P1 and P2) are put together into a total (T).

DIFFERENCE

1. Write B – s = D.

2. What's the compare sentence?
   • Does it give D or a number?

3. What's B and s?

4. Write the signs.

5. Find X!

B – s = D

In a Difference problem, where two amounts are compared - a bigger amount (B) and a smaller amount (s) - for a difference (D).
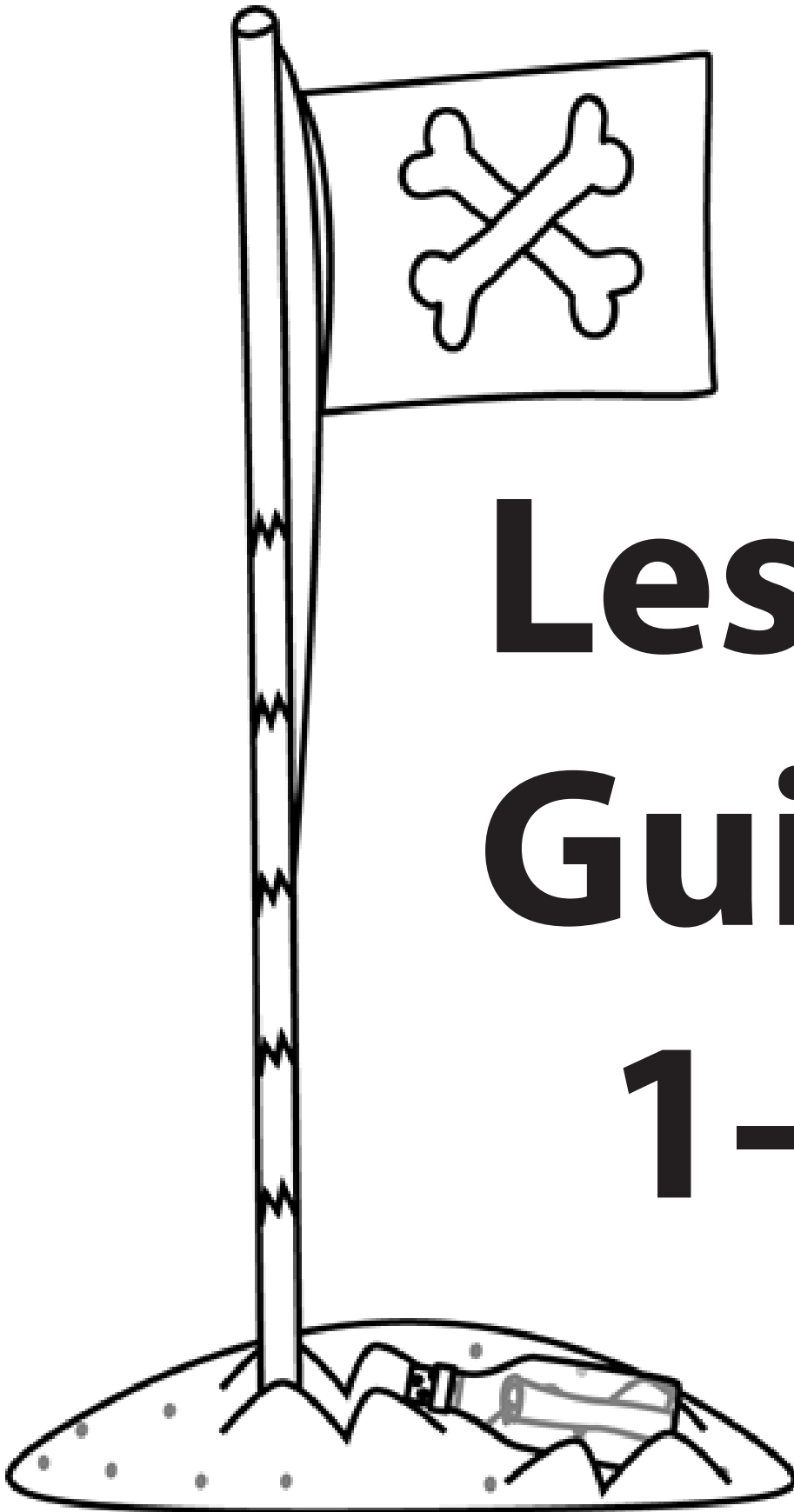
CHANGE

1. Write ST + C = E or ST – C = E

2. What's ST?

3. What's C?

4. What's E?
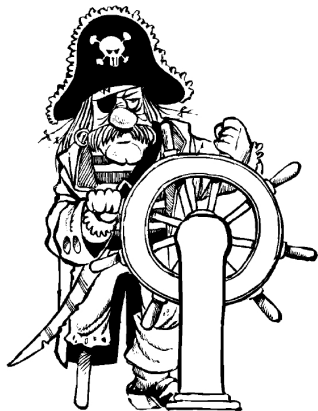
5. Write the signs.

6. Find X!

ST + C = E
ST – C = E

In a Change problem, there is a starting amount (ST) that increases or decreases - a change (C) - into an end amount (E).

Lesson
Guides
1-39

Lesson 5

Today's Activities:

1. Find X Flash Cards
2. Lesson
   Total
3. Total Game
4. Pirate Problems

MATERIALS

P

Posters:
    Find X! Poster   RUN! Poster
    Total Poster

Materials:
    Timers (2)   Treasure Chest
    Dry Erase Marker   Pencils
    Dry Erase Board   Colored Pencils
    Total Mat   Find X Flash Cards

Worksheets:
    Attendance Log   Total Game Worksheet
    Treasure Maps   Pirate Problems 5
    PM Worksheet 5
    Equation Worksheet

TUTOR LESSON

Let's get started on *Pirate Math*. Remember, when we work on math problems together, you can earn checkmarks for being on task and doing math problems correctly.

(Set timer, without student noticing, using the guide on the Attendance Log to determine the amount of time. Award checks as appropriate. Repeat.)

FIND X FLASH CARDS

Follow Activity Guide: Find X Flash Cards

Today, we'll work more on Total problems. Let's review. (Student), tell me what a Total problem is?

Student.

In a Total problem two parts are put together to make a Total. All Total problems have the same Total equation. (Student), what's the Total equation?

P1 + P2 = T.

Good. The Total equation is Part 1 plus Part 2 equals Total. We remember this as P1 plus P2 equals T.

Now, cover your Pirate Math Worksheet with this paper.

Total Equation

1. _____
2. _____
3. _____

Total Equation

1. _____
2. _____
3. _____

Hand out Equation Worksheet.

On these blanks (point), **write the Total equation from memory 3 times. Ready? Go.**

Monitor student while he/she writes the Total equation 3 times from memory.

Good work. Now let's get started on our Pirate Math Worksheet.
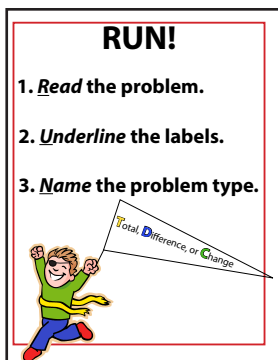
Hand out PM Worksheet 5.

As tutor models Total problems, have student work the problems on his/her own worksheets.

Look at Problem A (point)**.** (Problem A: Jamie has 1 cat. He also has 2 dogs. How many cats and dogs does Jamie have?)

(Student), what's the first thing we do when we see a word problem?

We RUN through the problem.

Good. Let's RUN through this problem together.

Display RUN! Poster.

(Student), what does the R stand for?

Read the problem.

That's right. Whenever you see a word problem, the first step is to read the problem. Let's read the problem right now. "Jamie has 1 cat. He also has 2 dogs. How many cats and dogs does Jamie have?"

(Student), what do we do next? Look at the RUN poster if you need help (point)**.**

Underline the label.

Yes. U is for underline the label. Be careful. This problem is different from the problems we did yesterday. Look here (point to question)**. The question says, "How many cats and dogs does Jamie have?" The question is asking about cats *and* dogs. It's not just asking about cats. It's not just asking about dogs. It's asking about cats *and* dogs, so we need to underline both labels.**

(Student), if we just underline cats, is that correct?

No.

If we just underline dogs, is that correct?

No.

Why not?

Because the story is about cats and dogs.

That's right. Two different things are important in this problem: cat and dogs. Both of these things are important, so we need to underline cats *and* dogs. Let's underline cats and dogs now.

Underline cats and dogs. Monitor that student does this as well.

Nice job! Finding the label can be tricky. Sometimes the problem is about is one kind of thing, like apples. So we underline one word for our label. Other times, the problem is about two kinds of things, like apples and bananas. So, we underline two words for our label. You have to look at the problem to figure out whether the problem is about one kind of thing or two kinds of things. That tells us whether to underline one or two words for the label. Let's practice finding and underlining the label for the rest of the Total problems.

Look at Problem B (point)**.** (Problem B: Trevor has 2 red balls. He also has 3 blue balls. How many balls does Trevor have in all?)

We first read the problem together. Then, we find and underline the label. "Trevor has 2 red balls. He also has 3 blue balls. How many balls does Trevor have in all?" Let's think about the label for this problem. The question will help us figure out what to underline for the label. Look here (point to question)**. The question says, "How many balls does Trevor have in all?" (Student), what is this story talking about?**

Balls.

That's right. This problem is about the number of balls Trevor has. So, what should we underline?

Balls.

Good. Underline the word "balls" in the question now.

Underline balls. Monitor that student does this as well.

How many words did we need to underline for this label?

One word.

Right. The problem is about one kind of thing. So we underlined one word for the label: balls.

Nice job. Let's practice finding the label for Problem C (point)**.** (Problem C: Mary Anne has 2 pencils. She also has 3 markers. How many pencils and markers does Mary Anne have?) **We first read the problem. Then, we find and underline the label. "Mary Anne has 2 pencils. She also has 3 markers. How many pencils and markers does Mary Anne have?" Let's think about the label for this problem. Where should we look to figure out what to underline?**

The question.

Good. Let's read the question again. "How many pencils and markers does Mary Anne have?" (Student), what's this story talking about?

Pencils and markers.

Good. The question is asking about two kinds of things: pencils *and* markers. It's not just asking about pencils. It's not just asking about markers. It's asking about two kinds of things: pencils *and* markers. So we need to underline two words for our label.

(Student), if we just underline pencils, is that correct?

No.

If we just underline markers, is that correct?

No.

Why not?

Because the story is about pencils and markers.

That's right. Two different kinds of things are important in this problem: pencils and markers. Both kinds of things are important, so we need to underline both words: pencils *and* markers. Let's underline pencils and markers now.

Underline pencils and markers. Monitor that student does this as well.

So, (Student), what's the label for this problem?

Pencils and markers.

Nice job. Look at Problem D (point)**.** (Problem D: Mr. Powell has 5 carrots. He also has 2 potatoes. How many vegetables does he have in all?)

We first read the problem. Then, we find and underline the label. "Mr. Powell has 5 carrots. He also has 2 potatoes. How many vegetables does he have in all?" Let's think about the label for this problem. Where should we look to figure out what to underline?

The question.

Good. Let's read the question again. "How many vegetables does he have in all?" (Student), what is this story talking about?

Vegetables.

That's right. Vegetables is our label. This problem is different from the other problems we've worked on. The story tells about Mr. Powell's carrots and potatoes, but the question asks about vegetables. Are carrots and potatoes both kinds of vegetables?

Yes.

That's right. We could write "carrots and potatoes" for our label. Or we could write "vegetables" for our label. Carrots and potatoes are both types of vegetables. What are some other types of vegetables?

Students.

Right. The words vegetables can stand for more than one kind of vegetable. There are many kinds of vegetables. Carrots and potatoes are both kinds of vegetables. So we can use two words for our label: carrots and potatoes. Or we can use the one word that stands for all vegetables. The question uses the word "vegetables," so let's use that for our label instead of "carrots and potatoes." So, what should we underline?

Vegetables.

Good. Underline the word "vegetables" in the question now.

Underline vegetables. Monitor that student does this as well.

So, (Student), what's the label for this problem?

Vegetables.

Good. Let's practice finding the label for one more problem. Look at E (point)**.**
(Problem E: Ben has $5. Rachel has $2. How much money do they have in all?)

We first read the problem. Then, we find and underline the label. "Ben has $5. Rachel has $2. How much money do they have in all?" Let's think about the label for this problem. Where should we look to figure out what to underline?

The question.

Good. Let's read the question again. "How much money do they have in all?" (Student), what's this story talking about?

Money.

That's right. This problem is about money. So, what should we underline?

Money.

Good. Underline the word "money" in the question sentence now.

Underline money. Monitor that student does this as well.

When the label is money, you have to think some more about what your label will be. You have to stop and think, "What kind of money is the problem talking about? Is it about dollars or cents?" Look at this problem. What kind of money do Rachel and Ben have? Do you see a dollar sign or a cent sign?

A dollar sign.

Good. There's a dollar sign. We'll write a dollar sign under the word "money," like this.

Write $ under the word "money" in the question.

We write the dollar sign under the word "money" to remind us that the dollar sign will be our label. (Student), write a dollar sign under the word "money" now.

Monitor that student writes a $ under the word "money" in the question.

Let's solve the rest of this problem so I can show you what I mean. We already read the problem (point to R in RUN)**. We also underlined the label** (point to U in RUN)**. What do we do next?**

Name the problem type.

Good work. The N stands for name the problem type. What type of problem is this?

Total.

Why is it a Total problem?

Because it's about two amounts being put together to make a Total**.**

Very good. This is a Total problem because it's about 2 amounts put together to make a total. What are the parts?

Ben and Rachel's dollars.

Yes. One part is Ben's dollars. The other part is Rachel's dollars.

Hold up 1 hand for Ben's part. Hold up the other hand for Rachel's part.

**What's the total?**

How many dollars they have altogether.

That's right. The total is how many dollars Ben and Rachel have together.

Bring together both hands and clasp together.

Good. This is a Total problem because it's about 2 amounts, Ben's money and Rachel's money. We put T next to the problem to remind us that it's a Total problem. Write a T next to the problem.

Write T next to the problem. Monitor that student does this as well.

We decided this is a Total problem, so we use this Total Poster to help us solve it.

TOTAL

1. Write P1 + P2 = T

2. What's T?

3. What's P1 and P2?

4. Write the signs.

5. Find X!
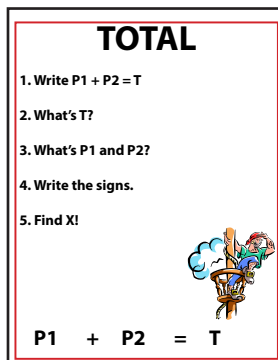
P1 + P2 = T

Display Total Poster.

(Student), what's Step 1?

Write P1 plus P2 equals T.

Yes. Write P1 plus P2 equals T under the word problem.

Write P1 + P2 = T on worksheet. Monitor that student does this as well.

(Student), what does Step 2 say?

What's T?

Yes. Step 2 says: "What's T?" (Point.) **We need to figure out if the problem gives us a number for T, of if T is the missing information. Let's look at the word problem again. The first sentence** (point) **says, "Ben has $5." So, the amount of money Ben has is part 1. The next sentence** (point) **says "Rachel has $2." So, the amount of money Rachel has is part 2. The question asks, "How much money do they have in all?" So, (Student), does the problem tell us the Total, does it tell us how much money Ben and Rachel have in all? Or, is the Total missing?**

The Total is missing.

Very good. Now write X under T.

Write X under T. Monitor that student does this as well.

Now let's look at Step 3. (Student), what does Step 3 say?

"What's P1 and P2?"

Good. Step 3 says, "What's P1 and P2?" Let's think about the two parts. In the question, we underlined money. So, part 1 is the amount of money that Ben has. The part 2 is the amount of money that Rachel has. We only want to find information that tells us about Ben and Rachel's money. So, (Student), what's P1?

5.

Yes. That's right. Part 1 is the amount of money that Ben has. He has $5. 5 is Part 1. Let's check off 5 in the problem, and write it in the number sentence underneath P1. Do that now.

Check off 5 and write 5 under P1. Monitor that student does this as well.

(Student), now what do we need to find?

Part 2.

Good. We need to find P2 in the story. (Student), can you find P2 in the story?

2.

That's right! Part 2 is the amount of money that Rachel has. She has $2. 2 is P2. Let's check off 2 in the problem, and write it in the number sentence underneath P2. Do that now.

Check off 2 and write it under P2. Monitor that student does this as well.

Good work. Now we have P1, P2 and T filled in the number sentence. We finished Step 3, now let's move on to Step 4. (Student), what does Step 4 say?

Write the signs.

Step 4 says, "Write the signs." (Student), what math signs do we need to complete our Total number sentence?

Plus and equal sign.

Right. We still need our plus sign and our equal sign. Let's do that now.

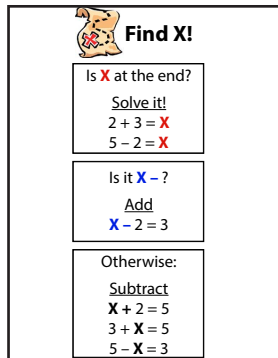*Write the plus sign and equal sign. Monitor that student does this as well.*

Now let's read the number sentence together.

5 plus 2 equals X.

Does this look like a number sentence we know how to solve?

Yes.

Right. Now you get to be a pirate and Find X. Use the *Find X!* Poster to help you.

Find X!

Is **X** at the end?

Solve it!
2 + 3 = **X**
5 − 2 = **X**

Is it **X** − ?

Add
X − 2 = 3

Otherwise:

Subtract
X + 2 = 5
3 + **X** = 5
5 − **X** = 3

Display Find X! Poster.

(Student), what question do you ask yourself first?

Is X at the end?

Good. So, is X at the end?

Yes.

(Student), how do we find X when X is at the end?

Solve it!

Good. Do we add or subtract to find X?

Add.

Right. The plus sign tells us to add. We add 5 plus 2. (Student), what's 5 plus 2?

7.

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

7.

Right. You said 5 plus 2 equals 7; so X is the same as 7. Let's put 7 in the problem where X is to see if this side is the same as that side. Write 5 plus 2 equals 7 underneath 5 plus 2 equals X.

Write 5 + 2 = 7 under 5 + 2 = X. Monitor that student does this as well.

Does 7 make this side (point) **the same as that side** (point)**?**

Yes.

Right. 5 plus 2 is the same as 7. That makes sense. So X equals 7. Write X equals 7.

Write X = 7 under 5 plus 2 is the same as 7. Monitor that student does this as well.

We're not quite finished with the problem. (Student), what else should we do?

Label it.

Good. We know that 7 is the number answer, but we still need a label. What did we decide for our label?

The dollar sign.

Good. We wrote a dollar sign under the word "money" (point). **This tells us to use the dollar sign as our label. So, we write a dollar sign before the 7, like this.**

Write $ next to 7. Monitor that students do this as well.

Good job! Money problems can be tricky! (Student), when money is the important word in the question sentence, what do we do?

We ask ourselves, is the problem talking about dollars or cents?

Good. If the problem is about dollars, write the dollar sign under the word "money." If the problem is about cents, write the cent sign under the word "money." You'll see a lot of money problems in *Pirate Math*. Remember, always ask yourself, "Is the problem talking about dollars or cents?" Then, write the dollar sign or a cent sign under the word money. Then you'll know how to label the answer!

Nice work finding the label today! Finding the label is a *very* important step for solving word problems. Remember to always look at the question to figure out the label. Sometimes the problem is about one kind of thing, like cookies. Other times, the problems is about two kinds of things, like cookies and brownies. When the question asks about money, make sure to always ask, "Is the story about dollars or cents?"
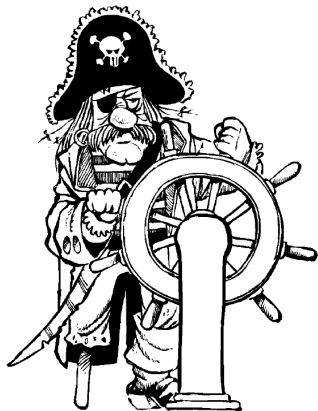
TOTAL GAME

Follow Activity Guide: Total Game

PIRATE PROBLEMS

Follow Activity Guide: Pirate Problems

Great! Let's count the number of checks you earned today and color the coins on your Treasure Maps. See you next time!

Lesson 17

Today's Activities:

1. Difference Game
2. Lesson

     Total and Difference

3. Sorting Game
4. Pirate Problems

MATERIALS

P

Posters:

Find X! Poster	RUN! Poster
Total Poster	Difference Poster

Materials:

Timers (2)	Treasure Chest
Dry Erase Marker	Pencils
Dry Erase Board	Colored Pencils
Greater Gator Cards	Highlighters
Greater Than/Less Than Cards	Sorting Mat
Sorting Cards	Sorting Graph

Worksheets:

Attendance Log	Difference Game Worksheet
Treasure Maps	Pirate Problems 17
PM Worksheet 17	
Equation Worksheet	

TUTOR LESSON

Let's get started on *Pirate Math*.

(Set timer, without student noticing, using the guide on the Attendance Log to determine the amount of time. Award checks as appropriate. Repeat.)

DIFFERENCE GAME

Today, we'll do the Difference Game.
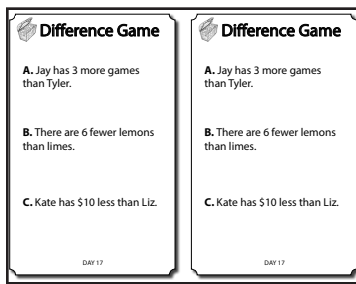
In Difference problems, we <u>compare</u> two amounts to find the Difference. One amount is bigger. The other amount is smaller. A Difference problem uses words like *more, fewer* and *less* to tell us the bigger and smaller amounts. These <u>compare words</u> are found in the <u>compare sentence</u>. Let's review.

<u>(Student)</u>, when you see the word *more,* do you write a greater than or less than sign?

Display Mr. Greater Gator Card and point as you say greater than/less than.

Greater than.

Good. When we see the word *more*, we use the greater than sign. <u>(Student)</u>, when you see the word *less,* do you write a greater than or less than sign?

Display Mr. Greater Gator Card and point as you say greater than/less than.

Less than.

Great. When we see the word *less*, we use the less than sign. <u>(Student)</u>, when you see the word *fewer,* do you write a greater than or less than sign?

Display Mr. Greater Gator Card and point as you say greater than/less than.

Less than.

Good. If this side has fewer than that side we use the less than sign. When we see the word *fewer,* we use the less than sign.

In the Difference game, we read a compare sentence and figure out who has the Bigger amount and who has the smaller amount. Here are the steps:

1. **Underline the two things we're comparing.**
2. **Write the greater than or less than sign between the two things we're**

      comparing.

   3. **Write B and s on the things we're comparing.**

Let's practice together. Look at the first sentence (point to sentence A): **"Jay has 3 more games than Tyler." First, let's underline the two things being compared. This sentence is comparing the games Jay and Tyler have. Let's underline Jay and Tyler. Your paper should look like this.**

Monitor that student underlines <u>Jay</u> and <u>Tyler</u>.

Good. We underlined Jay and Tyler because that's whose games we're comparing.

Now, let's write the greater than or less than sign. I'll read the sentence again. You decide if we need a greater than or less than sign. "Jay has 3 more games than Tyler."

(<u>Student</u>) Do we need a greater than or less than sign?

Greater than.

Good. We need a greater than sign because the word more (point) **is in the compare sentence. In this sentence we draw the greater than sign over more because that's between the two things we're comparing. Let's draw that now.**

Write > over the word more. Monitor that student does this as well.

Think about "Mr. Greater Gator," the alligator. He wants to eat the Bigger amount, the amount that's more. So, the alligator's mouth always opens so it's closer to the bigger amount. Look at Jay (point) **and Tyler** (point). **Who is the alligator's mouth open to?**

(<u>Student</u>), What is the Bigger amount?

Jay.

Good. Jay is the Bigger amount because the alligator's mouth is open to Jay. Let's write B over Jay.

Write B over Jay. Monitor that student writes B over Jay.

If Jay is the Bigger amount, <u>(Student)</u> what is the smaller amount?

Tyler.

Good. Let's write s over Tyler.

Write s over Tyler. Monitor that student writes s over Tyler.

Good job with the Difference game! You looked at a compare sentence and labeled who has the Bigger and smaller amounts! Let's try another one.

This time, I'll work on my paper and you'll work on your paper. I'll give you 30 seconds to work. Then we'll make sure we did the Difference Game the same way! Remember, you have to do these three things:

1. **Underline the two things we're comparing.**
2. **Write the greater than or less than sign between the two things we're comparing.**
3. **Write B and s on the things we're comparing.**

Listen as I read the compare sentence. "There are 6 fewer lemons than limes." Play the Difference Game!

Give student about 30 seconds (or less if he/she finishes beforehand) to do the 3 steps.

Make sure your paper looks like mine! I underlined lemons and limes. The word fewer told me I needed a less than sign. I wrote the less than sign between lemons and limes. The Greater Gator's mouth is open to limes, so I know limes is B. That means lemons is s. Nice job!

— — — — — — — — — — — — — — — — — — —

If student does well on sentence B, have him/her do the sentence C without help. Review at the end.

— — — — — — — — — — — — — — — — — — —

If student does <u>not</u> do well <u>working by themselves</u> on sentence B, follow the procedures from sentence A to help them play the Difference Game.

— — — — — — — — — — — — — — — — — — —

Let's try another one. Remember, you have to do these three things:

1. **Underline the two things we're comparing.**
2. **Write the greater than or less than sign between the two things we're comparing.**

3. Write B and s on the things we're comparing.

Listen as I read the compare sentence. "Kate has $10 less than Liz." Play the Difference Game!

Give student about 30 seconds (or less if he/she finishes beforehand) to do the 3 steps.

Make sure your paper looks like mine! I underlined Kate and Liz. The word less told me I needed a less than sign. I wrote the less than sign between Kate and Liz. The Greater Gator's mouth is open to Liz, so I know Liz is B. That means Kate is s. Nice job!

PIRATE MATH LESSON

Today, we'll talk about Total problems and Difference problems. We'll talk about how they're alike. We'll talk about how they're not alike. Let's review. Who can tell me what a Difference problem is?

Student.

In a Difference problem, we compare two amounts to find a Difference. All Difference problems have the same Difference equation. (Student), what's the Difference equation?

$B - s = D.$

Good. The Difference equation is B minus s equals D. The Bigger amount minus the smaller amount equals the Difference. Who can tell me what a Total problem is?

Student.

In a Total problem, we put together two amounts to find a Total. All Total problems have the same Total equation. (Student), what's the Total equation?

$P1 + P2 = T.$

Good. The Total equation is P1 plus P2 equals T. Part one plus Part two equals the Total.

Now, cover your Pirate Math Worksheet with this paper.

Equations

Difference   Total

1. _____   1. _____

2. _____

3. _____

Equations

Difference   Total

1. _____   1. _____

2. _____

3. _____

Hand out Equation Worksheet.

On these blanks (point), **write the Difference equation from memory 3 times. Then, on these blanks** (point) **write the Total equation from memory 1 time. Ready? Go.**

Monitor student while he/she writes the Difference equation 3 times and Total equation 1 time from memory.

Good work. Now let's get started on our Pirate Math Worksheet.

Hand out PM Worksheet 17.

Look at Problem A (point). ("Four kids at recess are playing tag. Two kids are jumping rope. How many more kids are playing tag than jumping rope?")

> *Solution to Problem A*
> *Problem Type:*   *Difference*
> *Relevant Info:* $B = 4; s = 2; D = X$
> *Number Sentence:* $4 - 2 = X$
> *Answer:* $X = 2$ *kids*

What's the first thing we do when we see a word problem?

We RUN through the problem.

Good. Let's RUN through this problem together.

P

Show RUN! Poster.
Follow Activity Guide: RUN!

When you get to "N," say:
(Student), what does the N stand for in RUN?

Name the problem type.

Let's decide. The N stands for name the problem type. Remember, you have to think hard to name the problem type. Is this a Total problem or a Difference problem? We know a problem is a Difference problem if it has a compare sentence. Let's look for a compare sentence. Do you see a compare sentence in this problem?

Yes.

What's the compare sentence?

How many more kids are playing tag than jumping rope?

Yes. The compare sentence is "How many more kids are playing tag than jumping rope?" (Student), why is this a compare sentence?

Because it uses the word more to compare the amount of kids playing tag and the amount of kids jumping rope.

Good. This is a compare sentence because it uses the word *more* (point) to compare the amount of kids playing tag and the amount of kids jumping rope. Let's draw brackets around this compare sentence.

Draw brackets around the compare sentence. Monitor that student does this as well.

(Student), now that we know the story tells us about two amounts being compared, what kind of problem do you think this is?

Difference Problem.

Let's ask ourselves a question, just to make sure this is a Difference problem. To decide whether the problem is a Difference problem, we ask ourselves: Are two amounts compared for a difference? So, are two amounts compared for a difference?

Yes.

Right. So, is this a Difference problem?

Yes.

(Student), what should I put next to the problem to remind us that this is a Difference problem?

D.

Good. We put D next to the problem to remind us that this is a Difference problem. Go ahead and do that now.

Monitor that student writes D next to the problem.

Let's use this Difference Poster to help us solve this Difference problem.

Display Difference Poster.
Solve Difference Problem
Follow Activity Guide: Difference

Display Find X! Poster.
Find X: "X at the end"
Follow Activity Guide: Find X!

Look at Problem B (point). (Four kids at recess are playing tag. Two kids are jumping rope. How many kids are there in all?)

> *Solution to Problem B*
> *Problem Type:*   *Total*
> *Relevant Info:*   *P1 = 4; P2 = 2; T = X*
> *Number Sentence:*   *4 + 2 = X*
> *Answer:*   *X = 6 kids*

What's the first thing we do when we see a word problem?

We RUN through the problem.

Good. Let's RUN through this problem together.

Show RUN! Poster.
Follow Activity Guide: RUN!

When you get to "N," say:
(Student), what does the N stand for in RUN?

Name the problem type.

Good. The N stands for name the problem type. Let's think about this problem. Have we heard this story before?

Student.

Yes. We've heard *parts* of this story before. We just worked a problem where four kids at recess are playing tag and two are jumping rope (point)**. (Student), how are these problems alike?**

They are alike because they are both about 4 kids playing tag and 2 kids jumping rope.

Good. Both of the problems are about kids at recess. (Student), but how are these problems not alike?

They are not alike because the questions are different.

That's right. The questions are different. Let's compare the questions (Show supplemental worksheet with 2 problems)**. Look at Problem A** (point)**. (Student), what's the question for Problem A?**

How many more kids are playing tag than jumping rope?

The question for Problem A (point) **is, "How many more kids are playing tag than jumping rope?" This is the compare sentence. Does this question ask us to compare the kids at recess or put the amount of kids at recess together?**

It asks us to compare the kids.

That's right. The question for Problem A (point) **asks us to compare the number of kids playing tag and the number of kids jumping rope. When a story asks us to compare two amounts, what kind of problem is it?**

Difference.

That's right. When a question asks us to compare two amounts, we know it's a Difference problem. I write D next to Problem A like this (point) **to help me remember this is a Difference problem.**

Now let's look at the question for Problem B (point)**. (Student), what's the question for Problem B?**

How many kids are there in all?

Yes. The question for Problem B (point) **says, "How many kids are there in all?" (Student), is this question asking us to compare the number of kids at recess or put the number of kids at recess together?**

It asks us to put the number of kids together.

That's right. This question (point) **asks us to put the number of kids together. When a question asks us to put two amounts together, what kind of problem is it, (Student)?**

A Total problem.

Good. (Student), how do you know this is a Total problem?

Two parts are put together to make a Total.

Good. This is a Total problem because it's about 2 amounts put together to make a Total. What are the parts?

The amount of kids playing tag and the amount of kids jumping rope.

Yes. One part is the amount of kids playing tag. The other part is the amount of kids jumping rope.

Hold up 1 hand for the tag part. Hold up the other hand for the jumping rope part.

What's the total?

How many kids are playing tag and jumping rope altogether.

That's right. The total is how many kids are playing tag and jumping rope together.

Bring together both hands and clasp together.

The two parts are put together to make a total. So, this is a Total problem.

(Student), what should we put next to the problem to remind us that this is a Total problem?

T.

Good. We put T next to the problem to remind us that this is a Total problem. Do that now.

Monitor that student writes T next to the problem.

Let's use this Total Poster to help us solve it.

P

> *Display Total Poster.*
> *Solve Total Problem*
> *Follow Activity Guide: Total*

P

> *Display Find X! Poster.*
> *Find X: "X at the end"*
> *Follow Activity Guide: Find X!*

Good work! Deciding the problem type is tricky. You did a great job!

SORTING GAME

> *Follow Activity Guide: Sorting Game*

PIRATE PROBLEMS

> *Follow Activity Guide: Pirate Problems*

Great! Let's count the number of checks you earned today and then you can color in your coins on your Treasure Map. See you next time!

Lesson 29

Today's Activities:

1. Find X Flash Cards
2. Lesson
    Change
3. Sorting Game
4. Pirate Problems

MATERIALS

P Posters:

Find X! Poster   RUN! Poster
Change Poster

Materials:

Timers (2)   Treasure Chest
Dry Erase Marker   Pencils
Dry Erase Board   Colored Pencils
Sorting Cards   Find X Flash Cards
Sorting Mat   Highlighters
Sorting Graph

Worksheets:

Attendance Log   Pirate Problems 29
Treasure Maps
PM Worksheet 29
Equation Worksheet

TUTOR LESSON

Let's get started on *Pirate Math*.

(Set timer, without student noticing, using the guide on the Attendance Log to determine the amount of time. Award checks as appropriate. Repeat.)

FIND X FLASH CARDS

Follow Activity Guide: Find X Flash Cards

Today, we'll work more on Change problems. Let's review. (Student), what's a Change problem?

Student.

In a Change problem, you start with an amount of something. Then, something happens to increase or decrease the amount you started with. So, you end up with a new amount. (Student), what's the Change equation?

ST +/− C = E

Right. The Difference equation is ST plus or minus C equals E (point). **The Starting amount plus or minus the Change amount equals the End amount.**

Now, let's practice writing your Total, Difference, and Change equations from memory like we always do. Ready? Go.

Equations		
Change	Difference	Total
1._____	1._____	1._____
2._____		
3._____		

Equations		
Change	Difference	Total
1._____	1._____	1._____
2._____		
3._____		

Hand out Equation Worksheet.

Monitor student while he/she writes the Total, Difference equations 1 time and Change equation 3 times from memory.

Good work. Let's get started on our Pirate Math Worksheet.

Hand out PM Worksheet 29.

Look at Problem A (point). ("Brian had 5 songs on his iPod. Then, he added 4 more songs to his iPod. How many songs does Brian have on his iPod now?")

Solution to Problem A
Problem Type: *Change*
Relevant Info: $ST = 5; + C = 4; E = X$
Number Sentence: $5 + 4 = X$
Answer: $X = 9$ *songs.*

What's the first thing we do when we see a word problem?

We RUN through the problem.

Good. Let's RUN through this problem together.

Show RUN! Poster.
Follow Activity Guide: RUN!

When you get to "N," say:
(Student), what does the N stand for in RUN?

Name the problem type.

Good. The N stands for name the problem type. If it has a compare sentence, we know it's a Difference problem. Let's look for a compare sentence. Do either of you see a compare sentence in this problem?

No.

Good. There's no compare sentence in this problem. We see a comparing word *more* but 2 things are not being compared. So, can it be a compare sentence?

No.

Good. It's not a compare sentence. That means it can't be a Difference problem. It's either a Total problem or a Change problem. Let's decide. This problem talks about songs: Brian had 5 songs on his iPod, then he added 4 more songs to his iPod. The question asks how many songs he has on his iPod now? What kind of problem do you think this is?

Student.

Let's ask ourselves a question, just to make sure this is a Change problem. To decide whether the problem is a Change problem, we ask ourselves: Does

a starting amount increase or decrease to a new amount? (Student), does a starting amount increase or decrease to a new amount?

Yes.

Right. So, is this a Change problem?

Yes.

That's right. This problem is a Change problem because the problem tells us a Starting amount: the amount of songs Brian had on his iPod to start with. Then something happens to the Change amount. (Student), what happens?

He added 4 more songs to his iPod.

Right. Brian added 4 more songs to his iPod. (Student), if he adds 4 more songs to his iPod, did the Starting amount increase or decrease?

Increase.

Right. It's a Starting amount that's increasing. (Student), if it's increasing, do we add or subtract?

Add.

Yes. (Student), do we use a plus sign or a minus sign?

Plus sign.

Good. We use a plus sign. We write plus C to remind us that this problem is a Change problem that increases. Write plus C.

Monitor that student writes + C next to Problem C.

Let's use this Change Poster to help us solve this problem.

Display Change Poster.
Solve Change Problem
Follow Activity Guide: Change

Look at Problem B (point). ("The graph shows how many kids voted for football as their favorite sport. Then, 4 more kids voted for football. How many votes are for football now?")

Solution to Problem B
Problem Type: Change, graph
Relevant Info: $ST = 5; + C = 4; E = X$
Number Sentence: $5 + 4 = X$
Answer: $X = 9$ votes.

What should we always do to a picture or graph before we read the word problem?

Number it!

Go ahead and number the graph now.

Monitor that student numbers the graph correctly.

Good job numbering the graph. Now, let's RUN through this problem together.

When you get to "N," say:
(Student), what does the N stand for in RUN?

Name the problem type.

Good. The N stands for name the problem type. If it has a compare sentence, we know it's a Difference problem. Let's look for a compare sentence. Do either of you see a compare sentence in this problem?

No.

Good. There's no compare sentence in this problem. We see a comparing word *more* but 2 things are not being compared. So, can it be a compare sentence?

No.

Good. It's not a compare sentence. That means it can't be a Difference problem. It's either a Total problem or a Change problem. Let's decide. This problem talks about votes: The graph shows how many kids voted for football to start with, then 4 more kids voted for football. The question asks how many votes are for football now? What kind of problem do you think this is?

Student.

Let's ask ourselves a question, just to make sure this is a Change problem. To decide whether the problem is a Change problem, we ask ourselves: Does a starting amount increase or decrease to a new amount? (Student), does a starting amount increase or decrease to a new amount?

Yes.

Right. So, is this a Change problem?

Yes.

That's right. This problem is a Change problem because the problem tells us a Starting amount: the amount of votes for football. Then something happens to the Change amount. (Student), what happens?

4 more kids vote for football.

Right. 4 more kids vote for football. (Student), if 4 more kids voted for football, did the Starting amount increase or decrease?

Increase.

Right. It's a Starting amount that's increasing. (Student), if it's increasing, do we add or subtract?

Add.

Yes. (Student), do we use a plus sign or a minus sign?

Plus sign.

Good. We use a plus sign. We write plus C to remind us that this problem is a Change problem that increases. Write plus C. Make your paper look like mine.

Write + C next to Problem C. Monitor that student does this as well.

Let's use this Change Poster to help us solve this problem.

Display Change Poster.
Solve Change Problem

Follow Activity Guide: Change

Display Find X! Poster.
Find X: "X at the end"
Follow Activity Guide: Find X!

Look at Problem C (point). ("April had 6 slices of pizza and 2 cokes. Then, she gave 4 slices of pizza away. How many slices of pizza does April have now?")

> *Solution to Problem C*
> *Problem Type:*   *Change*
> *Relevant Info:*   *ST = 6; – C = 4; E = X*
> *Irrelevant Info:*   ~~*and 2 cokes.*~~
> *Number Sentence:* *6 – 4 = X*
> *Answer:*   *X = 2 slices*

What's the first thing we do when we see a word problem?

We RUN! through the problem.

Good. We RUN! through the problem. Now, let's RUN through this problem together.

Show RUN! Poster.
Follow Activity Guide: RUN!

When you get to "N," say:
(Student), what does the N stand for in RUN?

Name the problem type.

Good. The N stands for name the problem type. If it has a compare sentence,

we know it's a Difference problem. Let's look for a compare sentence. Do either of you see a compare sentence in this problem?

No.

Good. It's not a compare sentence. That means it can't be a Difference problem. It's either a Total problem or a Change problem. Let's decide. This problem talks about slices of pizza: April had 6 slices of pizza, then she gave 4 slices of pizza away. The question asks how many slices of pizza April has now? What kind of problem do you think this is?

Student.

Let's ask ourselves a question, just to make sure this is a Change problem. To decide whether the problem is a Change problem, we ask ourselves: Does a starting amount increase or decrease to a new amount? (Student), does a starting amount increase or decrease to a new amount?

Yes.

Right. So, is this a Change problem?

Yes.

That's right. This problem is a Change problem because the problem tells us a Starting amount: the amount of pizza slices April had started with. Then something happens to the Change amount. (Student), what happens?

She gives 4 slices away.

Right. She gives 4 slices of pizza away. (Student), if she gives 4 slices away, did the Starting amount increase or decrease?

Decrease.

Right. Student), if it's decreasing, do we add or subtract?

Subtract.

Yes. (Student), do we use a plus sign or a minus sign?

Minus sign.

Good. We use a minus sign. We write minus C to remind us that this problem is a Change problem that decreases. Write minus C.

Monitor that student writes – C next to Problem C.

Let's use this Change Poster to help us solve this problem.

Display Change Poster.
Solve Change Problem
Follow Activity Guide: Change

Display Find X! Poster.
Find X: "X at the end"
Follow Activity Guide: Find X!

We're not quite finished with the problem. (Student), what do we need to do?

Label it.

Good. We know that 2 is the number answer, but we still need a label. What did we underline in the question?

Slices.

Good. So what's our label?

Slices.

Good. Write slices next to the number 2.

Monitor that student writes slices next to the number 2.

Good job working a Change problem. So, what does X equal?

2 slices.

That's right. X equals 2 slices!

SORTING GAME

Follow Activity Guide: Sorting Game

PIRATE PROBLEMS

Follow Activity Guide: Pirate Problems

Good work for today! Let's see how many checks you earned today and color in your coins on your Treasure Map. See you next time!

Pirate Math

Word-Problem Solving Program at Second Grade

Lynn S. Fuchs, Sarah R. Powell,
Robin F. Schumacher, Pamela M. Seethaler,
& Doug Fuchs

Excerpt
Supplemental Materials for Small-Group Intervention

Pirate Math Tutoring
Attendance Log

DAY 5 Date _____				Notes
5 minutes				
6 minutes				
10 minutes				
Student worksheet: - Correctly underlined the labels for Problem A.				
Student worksheet: - Correctly underlined the labels for Problem B.				
Student worksheet: - Correctly underlined the labels for Problem D.				
Pirate Problems: Used correct label ($) for word problem.				
Length of tutoring session, rounded to the nearest minute. (Write "A" if absent.)				
DAY 6 Date _____				*Notes*
3 minutes				
7 minutes				
5 minutes				
Student worksheet: - Correctly labeled the graph for Problem B.				
Student worksheet: - Correctly labeled the graph for Problem C.				
Student worksheet: - Correctly underlined the label for Problem D.				
Pirate Problems: Labeled graph.				
Length of tutoring session, rounded to the nearest minute. (Write "A" is absent.)				

Pirate Math Tutoring
Attendance Log

DAY 17 Date _____				Notes
10 minutes				
3 minutes				
5 minutes				
Student worksheet: - Wrote "X = 2 kids" for Problem A.				
Sorting Game: - Student met score from the previous day.				
Sorting Game: - Student beat score from the previous day.				
Pirate Problems: Wrote number sentence, "$10 − X = $7"				
Length of tutoring session, rounded to the nearest minute. (Write "A" if absent.)				
DAY 18 Date _____				*Notes*
6 minutes				
2 minutes				
12 minutes				
Student worksheet: - Wrote, "X = 2 crayons" for Problem A.				
Sorting Game: - Student met score from previous day.				
Sorting Game: - Student beat score from previous day.				
Pirate Problems: Solved at least 5 correct algebraic equations.				
Length of tutoring session, rounded to the nearest minute. (Write "A" is absent.)				

Pirate Math Tutoring
Attendance Log

DAY 29 Date _____				Notes
5 minutes				
10 minutes				
4 minutes				
Student worksheet: - Used correct label (slices of pizza) for Problem C.				
Sorting Game: - Student met score from the previous day.				
Sorting Game: - Student beat score from the previous day.				
Pirate Problems: Labeled graph correctly.				
Length of tutoring session, rounded to the nearest minute. (Write "A" if absent.)				
DAY 30 Date _____				*Notes*
7 minutes				
11 minutes				
2 minutes				
Student worksheet: - Wrote number sentence, "5 + 4 = X" for Problem A.				
Sorting Game: - Student met score from previous day.				
Sorting Game: - Student beat score from previous day.				
Pirate Problems: Solved at least 6 correct algebraic equations.				
Length of tutoring session, rounded to the nearest minute. (Write "A" is absent.)				
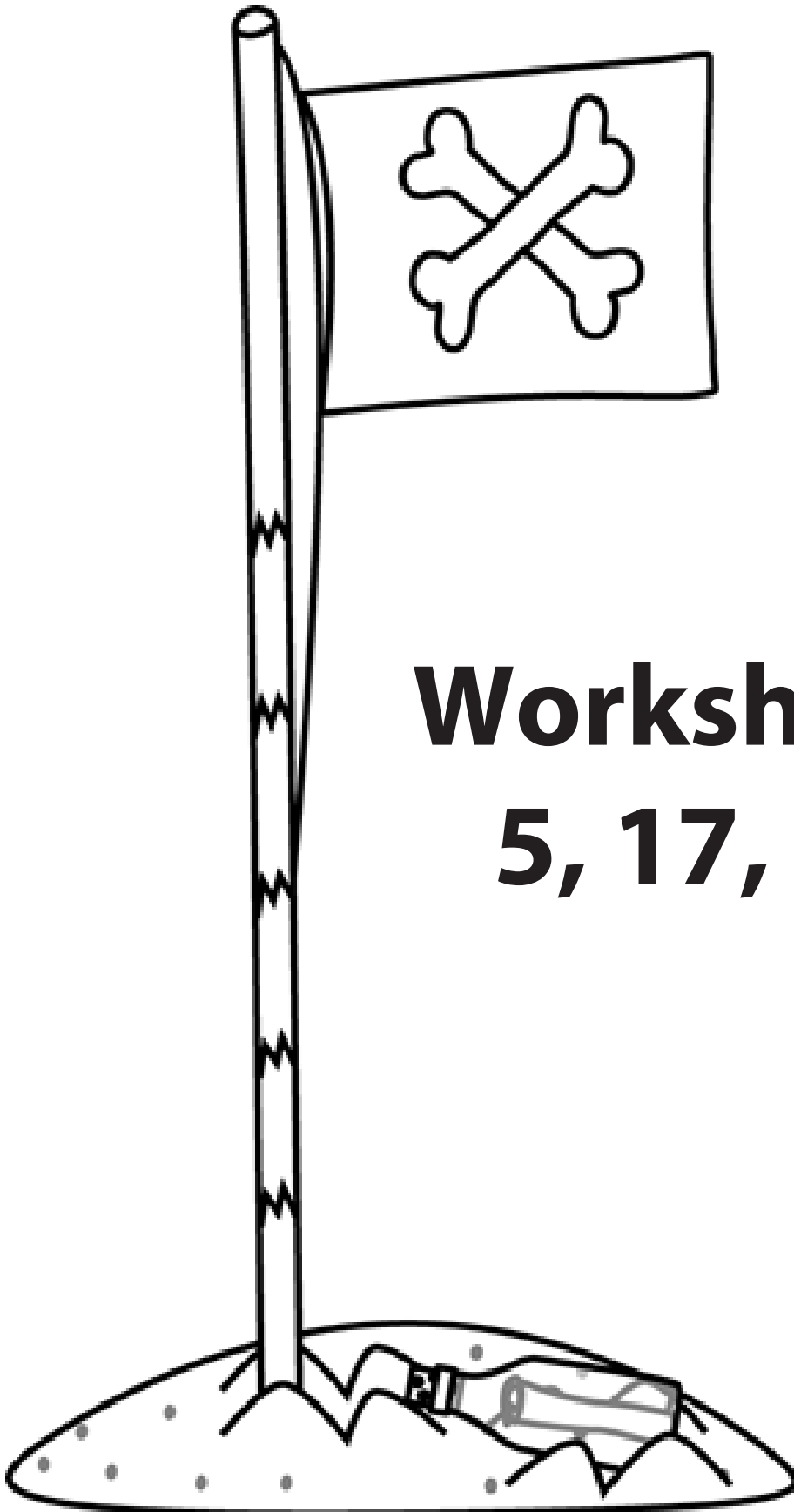
Worksheets Day 5, 17, and 29

Pirate Math Worksheet Day 5
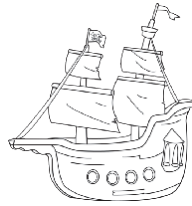
A. Jamie has 1 cat. He also has 2 dogs. How many cats and dogs does Jamie have?

B. Trevor has 2 red balls. He also has 3 blue balls. How many balls does Trevor have in all?

C. Mary Anne has 2 pencils. She also has 3 markers. How many pencils and markers does Mary Anne have?

D. Mr. Powell has 5 carrots. He also has 2 potatoes. How many vegetables does he have in all?

E. Ben has $5. Rachel has $2. How much money do they have in all?

Pirate Math Worksheet Day 17
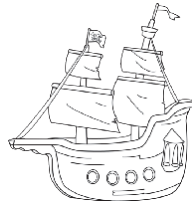
A. 4 kids at recess are playing tag. 2 kids are jumping rope. How many more kids are playing tag than jumping rope?

B. 4 kids at recess are playing tag. 2 kids are jumping rope. How many kids are there in all?

Pirate Math Worksheet Day 29
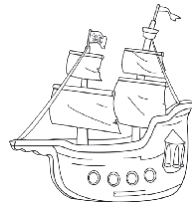
A. Brian had 5 songs on his iPod. Then, he added 4 more songs to his iPod. How many songs does Brian have on his iPod now?

B.
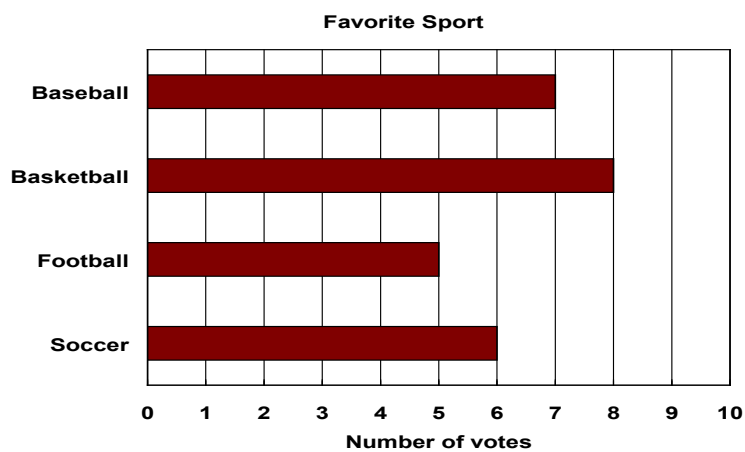
Favorite Sport

Sport	Number of votes
Baseball	7
Basketball	8
Football	5
Soccer	6

Number of votes: 0 1 2 3 4 5 6 7 8 9 10

The graph shows how many kids voted for football as their favorite sport. Then, 4 more kids voted for football. How many votes are for football now?

C. April had 6 slices of pizza and 2 cokes. Then, she gave 4 slices of pizza away. How many slices of pizza does April have now?
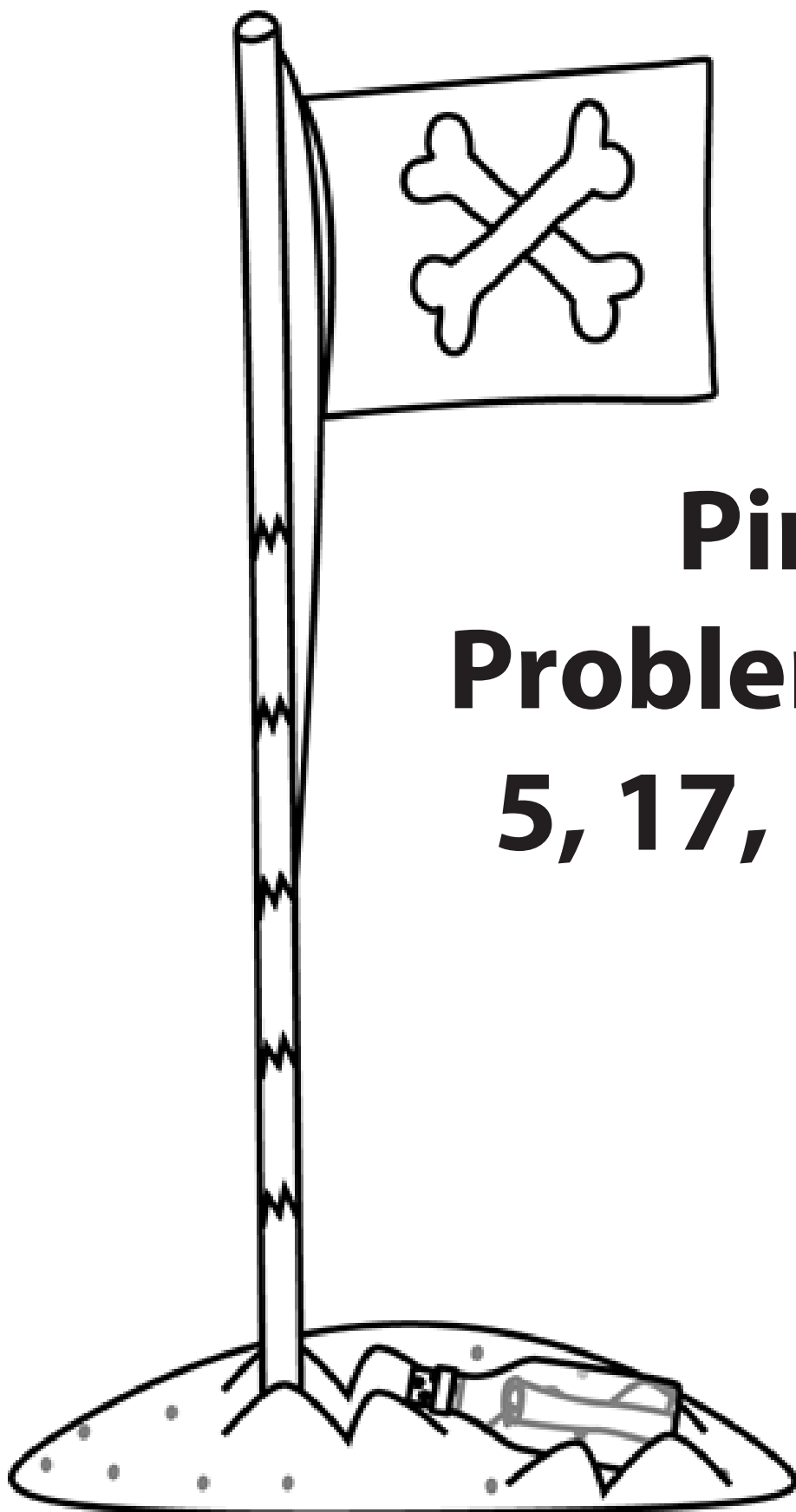
**Pirate
Problems Days
5, 17, and 29**

$X + 4 = 5$ $2 + 6 = X$ $X + 4 = 7$

$X =$ ___ $X =$ ___ $X =$ ___

$5 + X = 13$ $X + 4 = 9$ $X - 8 = 1$

$X =$ ___ $X =$ ___ $X =$ ___

$X - 3 = 7$ $2 + 3 = X$ $7 + X = 13$

$X =$ ___ $X =$ ___ $X =$ ___

Rob saved $5. Mandy saved $4. How much money did Rob and Mandy save together?

Rob saved $5. Mandy saved $4. How much money did Rob and Mandy save together?

$8 - X = 1$ $X - 9 = 4$ $9 + 2 = X$

$X = $___ $X = $___ $X = $___

$2 + 7 = X$ $X + 3 = 7$ $8 - X = 5$

$X = $___ $X = $___ $X = $___

$X - 6 = 7$ $4 + X = 10$ $9 - 3 = X$

$X = $___ $X = $___ $X = $___

Alex spent $10. Sue spent $7. How much more money does Alex have than Sue?

Alex spent $10. Sue spent $7. How much more money does Alex have than Sue?

$8 - X = 3$ $X - 2 = 8$ $2 + 9 = X$

$X = \_\_\_$ $X = \_\_\_$ $X = \_\_\_$

$6 + 7 = X$ $X + 4 = 9$ $7 - X = 5$

$X = \_\_\_$ $X = \_\_\_$ $X = \_\_\_$

$X - 6 = 3$ $5 + X = 8$ $10 - 6 = X$

$X = \_\_\_$ $X = \_\_\_$ $X = \_\_\_$

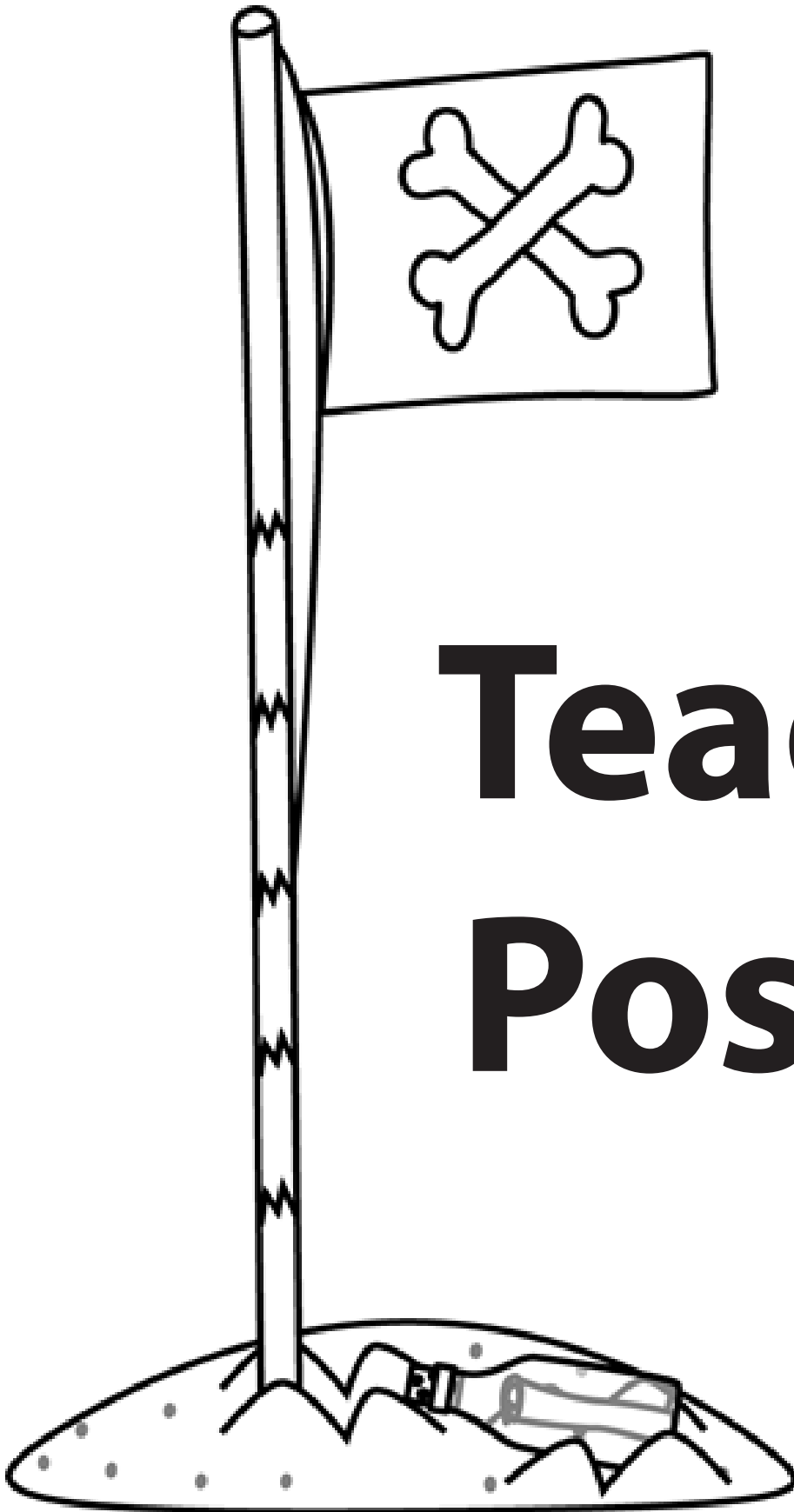| Puzzle Pieces	
Sharon	🧩 🧩 🧩 🧩 🧩 🧩
Tammy	🧩 🧩 🧩 🧩
Evan	🧩 🧩
Drew	🧩 🧩 🧩 🧩 🧩

Each 🧩 stands for 2 puzzle pieces.

The chart shows how many pieces Tammy put in the puzzle at first. Then, she put in 9 more pieces. How many pieces has Tammy put in the puzzle now?

Puzzle Pieces	
Sharon	🧩 🧩 🧩 🧩 🧩 🧩
Tammy	🧩 🧩 🧩 🧩
Evan	🧩 🧩
Drew	🧩 🧩 🧩 🧩 🧩

Each 🧩 stands for 2 puzzle pieces.

The chart shows how many pieces Tammy put in the puzzle at first. Then, she put in 9 more pieces. How many pieces has Tammy put in the puzzle now?

Teacher Posters

Find X!

Is **X** at the end?

Solve it!

$2 + 3 = X$

$5 - 2 = X$

Is it **X –** ?

Add

$X - 2 = 3$

Otherwise:

Subtract

$X + 2 = 5$

$3 + X = 5$
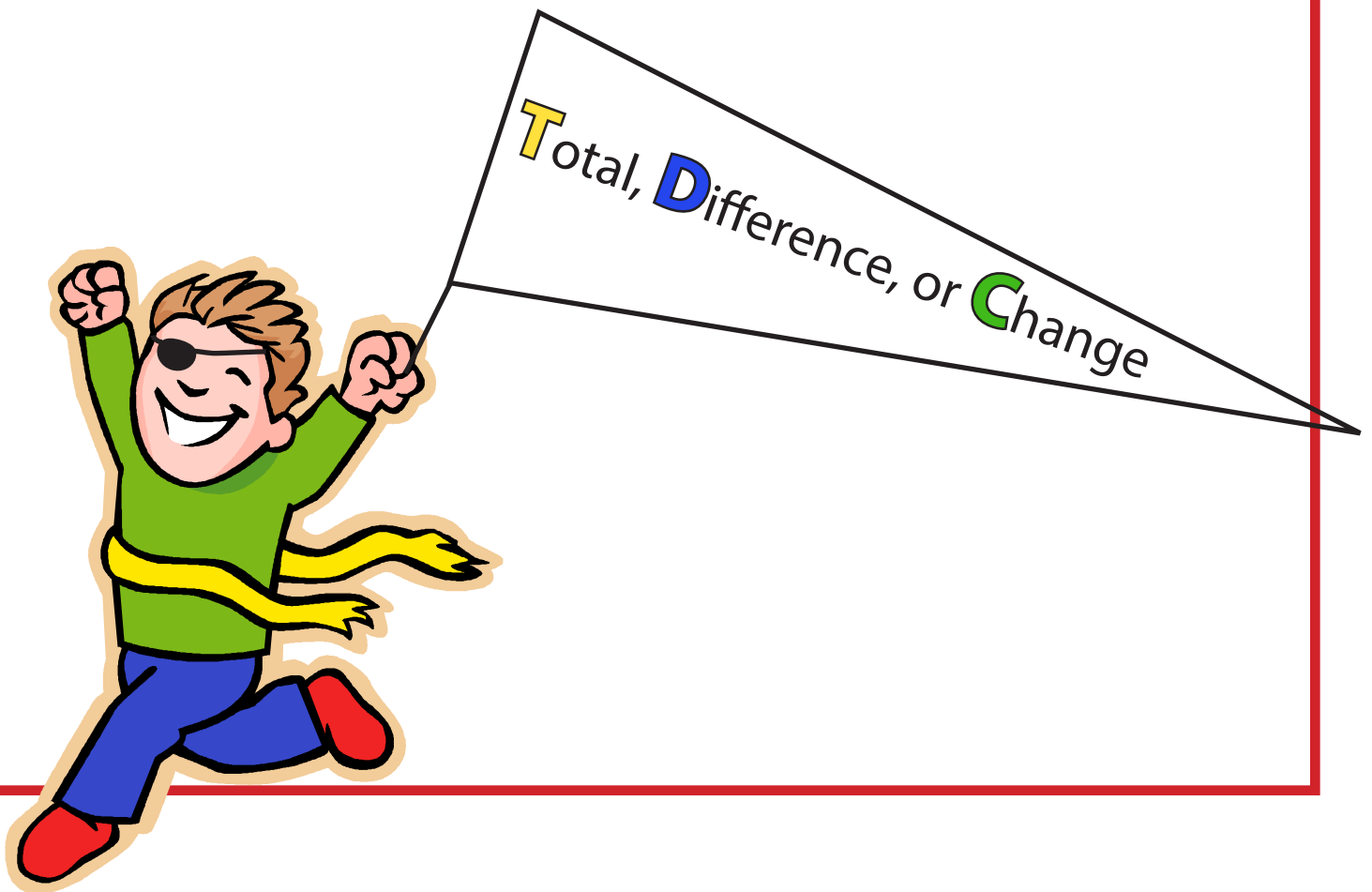
$5 - X = 3$

RUN!

1. *<u>R</u>ead* the problem.

2. *<u>U</u>nderline* the labels.

3. *<u>N</u>ame* the problem type.

<u>T</u>otal, <u>D</u>ifference, or <u>C</u>hange

TOTAL

1. Write P1 + P2 = T

2. What's T?

3. What's P1 and P2?

4. Write the signs.

5. Find X!

P1   +   P2   =   T

DIFFERENCE

1. Write B – s = D.

2. What's the compare sentence?
   • Does it give D or a number?

3. What's B and s?

4. Write the signs.

5. Find X!

B – s = D

CHANGE

1. Write ST + C = E or ST – C = E

2. What's ST?

3. What's C?

4. What's E?

5. Write the signs.

6. Find X!

ST + C = E
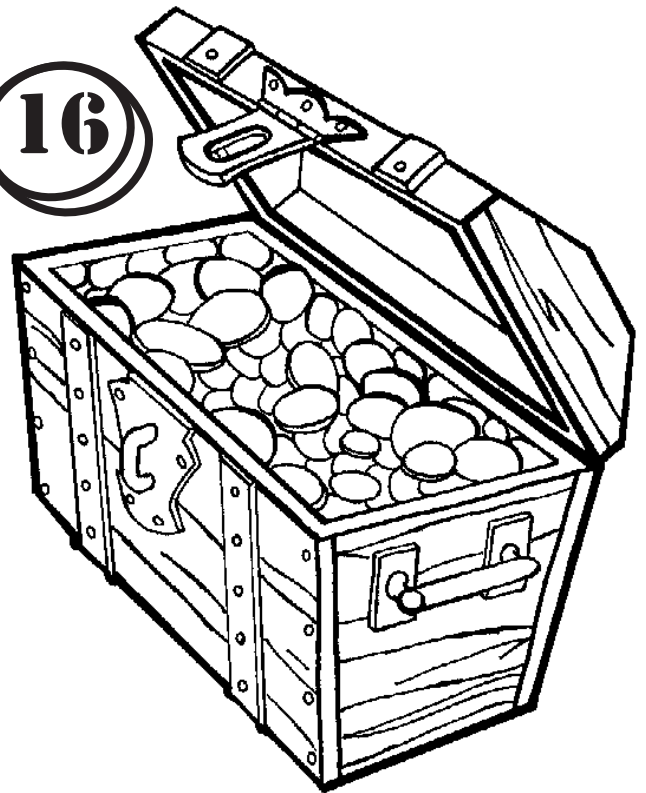**ST – C = E**

Treasure Maps

1　2　3　4　5

6

8　7

9

10

11

12　13　14　15　16

Pirate Math
Treasure Map

Name:

_____

Pirate Math
Treasure Map

Name:

_____