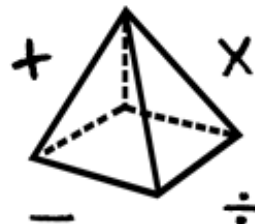




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Intensive Interventions
in Mathematics



Module 5

Activity Workbook

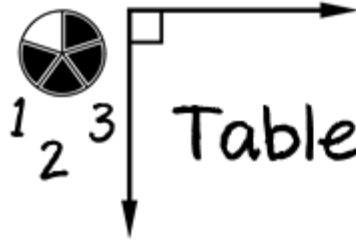
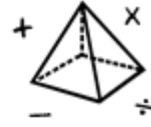
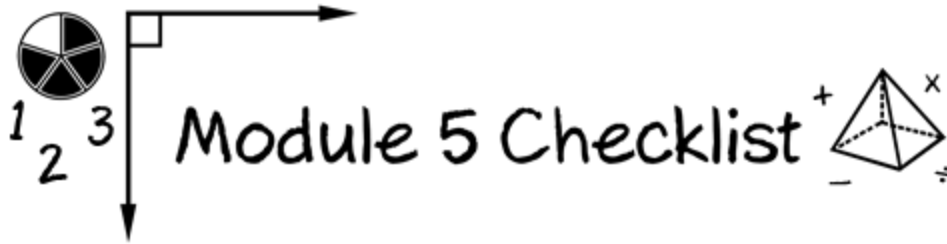


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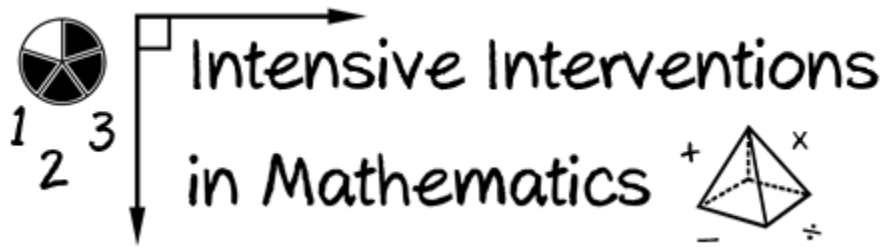
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Module 5 Checklist

The purpose of this Activity Workbook is to help organize content for this Module. There are some Activities that you will do on your own to help you engage with and think about the content. You will not be required to submit your responses for those activities. There are other activities, however, that you will submit online and apply in your classroom. The activities that you must submit before completing this Module are listed in the “Online” column below.

Section	Assignment	To Be Completed In Activity Workbook	To Be Completed On Online	To Be Completed With Coach
Intro	Video		<input type="checkbox"/> Watch Module 5 Introduction Video Presentation	
	Video		<input type="checkbox"/> Watch Module 5 Part 1 Video Presentation	
Part 1	Activity 1	<input type="checkbox"/> Make Remarks on Flashcard Routine		
	Activity 2	<input type="checkbox"/> Determine Which Facts to Use for Incremental Rehearsal		
	Activity 3	<input type="checkbox"/> Design a Taped Problems or Cover Copy Compare Sheet		
	Discussion		<input type="checkbox"/> Discussion Board: <i>Fluency Activity</i> <input type="checkbox"/> Share Your Activity <input type="checkbox"/> Respond to 2 Others	
	Video		<input type="checkbox"/> Watch Module 5 Part 2 Video Presentation	
Part 2	Activity 4	<input type="checkbox"/> Determine Why Using Key Words May Be Problematic		
	Activity 5 (Video Debrief)	<input type="checkbox"/> Identify the Problem Types for Additive Problems		
	Activity 6 (Video Debrief)	<input type="checkbox"/> Identify the Problem Type for Multiplicative Problems		
	Discussion		<input type="checkbox"/> Discussion Board: <i>Design and Share Word Problem Poster</i> <input type="checkbox"/> Write Your Response <input type="checkbox"/> Respond to 2 Others	
	Video		<input type="checkbox"/> Watch Module 5 Part 3 Video Presentation	
Part 3	Activity 7	<input type="checkbox"/> Analyze Motivation Component of an Intensive Intervention		
	Discussion		<input type="checkbox"/> Discussion Board: <i>Motivational Tools</i> <input type="checkbox"/> Write Your Response <input type="checkbox"/> Respond to 2 Others	
	Video		<input type="checkbox"/> Watch Module 5 Closing Video Presentation	
Next Steps	Classroom Application			<input type="checkbox"/> Preparing to Teach Word Problems



Intensive Interventions in Mathematics

- Module 5
- Part 1
- Activity #1



[Watch this tutor use a flash card routine.](#)

1. What's the routine?

2. How does the student practice?

3. How could you incorporate this strategy into your intensive intervention?



Intensive Interventions

in Mathematics




- Module 5
- Part 1
- Activity #2




Look at this student's answers to a multiplication test.


Which facts would you select for Incremental Rehearsal? (*Circle them.*)

$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$	$\begin{array}{r} 8 \\ \times 6 \\ \hline 42 \end{array}$	$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 8 \\ \hline 46 \end{array}$
$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$	$\begin{array}{r} 7 \\ \times 8 \\ \hline 65 \end{array}$	$\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$
$\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline 36 \end{array}$
$\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$	$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \\ \hline 65 \end{array}$
$\begin{array}{r} 6 \\ \times 7 \\ \hline 49 \end{array}$	$\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline 28 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$




Intensive Interventions in Mathematics

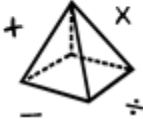


- Module 5
 - Part 1
 - Activity #3
- 

Design your own Cover, Copy, Compare or Taped Problems to use within intensive intervention.



Intensive Interventions in Mathematics



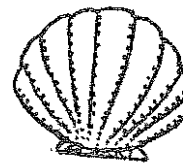
- Module 5
- Part 2
- Activity #4



Look at several problems.

1. Identify the *key words* used within each of the problems.
2. Describe how teaching students to identify these key words may be problematic.

Rosa has 4 shells in her pail.
She finds more shells in the sand.
Now she has 6 shells.
How many shells did Rosa find in the sand?



1. What are the key word(s)?
2. Why would teaching these key words be problematic?

Lisa had 3 pizzas. Each pizza was cut into 8 pieces. Lisa ate 2 pieces. How many pieces were left?
Write an equation to show how many pieces were left.

Smarter Balanced third-grade release item (2013)

1. What are the key word(s)?
2. Why would teaching these key words be problematic?

- Module 5
- Part 2
- Activity #4 (cont.)



Ramón has a total of 815 sheep in two fields. He has 348 sheep in one of the fields. How many sheep does Ramón have in the other field?

- F** 533
- G** 577
- H** 377
- J** 467

STAAR third-grade release item (2014)

1. What are the key word(s)?
2. Why would teaching these key words be problematic?

Frances used small, medium, and large cups to serve punch.

- She used 243 medium cups.
- She used 79 more medium cups than large cups.
- She used 56 more small cups than large cups.

How many small cups did Frances use to serve punch?

- F** 220
- G** 108
- H** 266
- J** Not here

STAAR fifth-grade release item (2014)

1. What are the key word(s)?
2. Why would teaching these key words be problematic?

Intensive Interventions
in Mathematics

- Module 5
- Part 2
- Activity #5

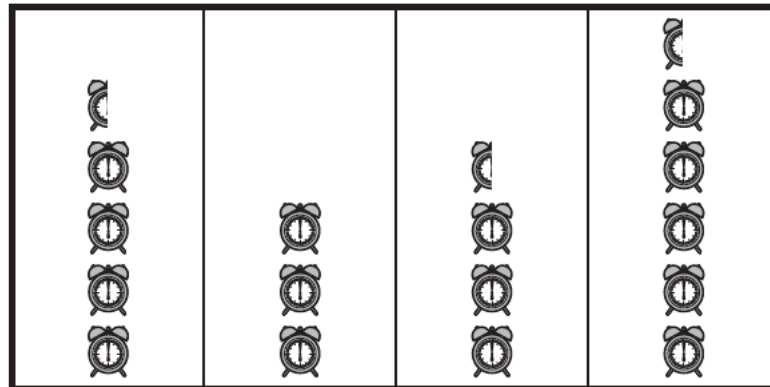


In this activity, you'll identify the schema of several additive word problems.

1. Read the word problem.
2. Identify the schema.
3. Solve the problem using the schema.

The graph below shows the number of minutes Ryan spent doing homework during four nights.

Homework Time



Monday Tuesday Wednesday Thursday

Each means 10 minutes.

How many minutes did Ryan spend doing homework on Tuesday and Thursday combined?

STAAR third-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

- Module 5
- Part 2
- Activity #5 (cont.)



Ramón has a total of 815 sheep in two fields. He has 348 sheep in one of the fields. How many sheep does Ramón have in the other field?

- F** 533
- G** 577
- H** 377
- J** 467

B

STAAR third-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

Third-grade students took a total of 1,000 pictures for the yearbook during the school year.

- Ted took 72 pictures.
- Mary took 48 pictures.

Ella took 8 more pictures than Ted took. How many more pictures did Ella take than Mary?

C

PARCC third-grade release item (2015)

4. Read the word problem.
5. What's the schema? _____
6. Solve the problem using the schema.

- Module 5
- Part 2
- Activity #5 (cont.)



D

Rosa had some stickers.
She gave 2 stickers to her friend.
Then she had 4 stickers left.
How many stickers did Rosa start with?



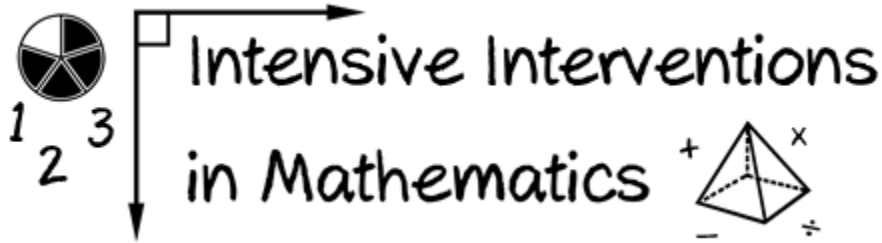
1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

E

There are 425 boys and 510 girls in Hank's school. How many more girls are there than boys?

SmarterBalanced third-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.



- Module 5
- Part 2
- Activity #6

In this activity, you'll identify the schema of several multiplicative word problems.

1. Read the word problem.
2. Identify the schema.
3. Solve the problem using the schema.

Jim uses ribbon to make bookmarks. Jim has 9 feet of ribbon. He uses $\frac{1}{3}$ foot of ribbon to make each bookmark.

What is the total number of bookmarks Jim makes with all 9 feet of ribbon?

Enter your answer in the box.

A

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

PARCC fifth-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

- Module 5
- Part 2
- Activity #6 (cont.)



Scott is reading a book that has 172 pages. Melanie is reading a book that has three times as many pages as Scott's book.

How many pages does Melanie's book have? Select **all** the equations that represent this problem.

$$172 \div 3 = \square$$

$$3 \times \square = 172$$

$$172 \times 3 = \square$$

$$\square \div 3 = 172$$

$$\square \div 172 = 3$$

$$172 \div \square = 3$$

B

SmarterBalanced fourth-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

Lindsay has 18 flowers. She plants them in 6 flower pots. Each flower pot has an equal number of flowers.

How many flowers are in each flower pot?

C

SmarterBalanced third-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

- Module 5
- Part 2
- Activity #6 (cont.)



A water dispenser contains 512 fluid ounces of water. What is the total number of 8-fluid-ounce cups of water that can be filled from the dispenser?

D

- F** 611
- G** 64
- H** 4,096
- J** 61

STAAR fifth-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.

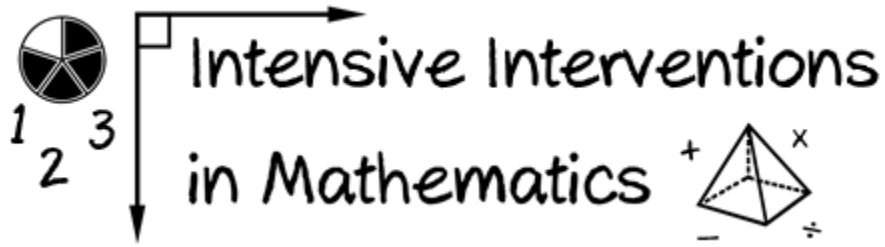
Isaiah put 301 floor tiles in 7 rows. Each row had the same number of tiles. How many tiles did Isaiah put in each row?


E

- F** 43
- G** 41
- H** 42
- J** 40

STAAR fourth-grade release item (2014)

1. Read the word problem.
2. What's the schema? _____
3. Solve the problem using the schema.



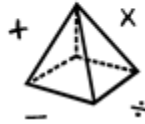
- Module 5
 - Part 2
 - Discussion
- 

Create a poster for intervention use that students could refer to when solving word problems. Share it with colleagues.

Create an original post on the Discussion Board and respond to two peers.
(This space is for organizing your ideas.)



Intensive Interventions in Mathematics



- Module 5
- Part 2
- Activity #7



Read this intensive intervention lesson about problem solving. How is the motivation system introduced? How often is it used throughout the lesson?



DAY 1

MATERIALS

Stopwatch	Colored pencil
Treasure Map	Attendance Log
Coins	Number line and clothespin
Treasure chest	<i>Counting Up Addition</i> poster
Math Fact Flash Cards	<i>Counting Up Subtraction</i> poster
Timer	Day 1 Student Worksheet
Flash Card Graph	Day 1 Pirate Problems

Hi. My name is _____, and we'll work together doing different types of math word problems over the next few months. Here's an example of a math word problem. "John and Barry have 13 bananas together. If John has 7 bananas, how many bananas does Barry have?" We'll work hard to learn how to solve math word problems just like that one.

While working on math word problems, we'll play "Pirate Math." Just like pirates, we'll have a treasure map. (Display treasure map.) The treasure map keeps track of the treasure coins you earn every time we work together. (Show treasure coins.) You earn treasure coins by following directions and working hard. Each time we work together, we'll count the number of coins you earned and color that number of footsteps on the treasure map. Once you find your way to the 'X' on the treasure map, you'll pick a prize from the treasure chest. (Show treasure chest.)

$$\begin{array}{r} 5 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ - 4 \\ \hline \end{array}$$

ACTIVITY 1: FLASH CARDS

The first activity we'll do every day is Math Fact Flash Cards. Look at these cards. (Show Math Fact Flash Cards.) Each card has one math problem on it. The problem is addition or subtraction. I'll show you one card at a time. Look at the problem, and tell me the answer as quickly as you can.

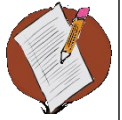
If you get the answer correct, I'll put it in a pile on the table.

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.) Good. At the end of 1 minute, we'll count the number of cards in the pile.

Are you ready? Let's try. (Show Math Fact Flash Cards for 1 minute.)

- Module 5
- Part 2
- Activity #7 (cont.)



Good. Let's count the cards in the pile. (Count cards with student.) **Great! You answered ___ Math Fact Flash 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. (Go through as many cards as 1 minute allows.)

Let's count the cards in the pile. (Count cards with student.) **Nice! You answered ___ Math Fact Flash Cards correctly. You beat / did not beat your score.**

Now, we'll graph your higher score for today on this graph. (Help student 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!



ACTIVITY 2: WORD PROBLEM WARM-UP (BEGINS ON DAY 7)

ACTIVITY 3: LESSON

PIRATE MATH STUDENT WORKSHEET
DAY 1

NAME: _____

DATE: _____

John and Barry have 13 bananas together. If John has 7 bananas, how many bananas does Barry have?

8 17 11

Over the next few days, you'll learn some math tools to help you solve math word problems. Today you'll learn how to use this number line and your fingers to add and subtract.

Look at the number line. (Display number line.) **Have you ever used a number line before?** (Student.) **This number line starts at 0 (point to 0) and goes up to 20 (point to 20). Each notch along the number line has one number on it.** (Point to numbers.) **Let's count the numbers now, starting with zero. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.** (Count from 0-20 with student, pointing to each number on the number line.)

(Place number line in front of student.) **Now, let's play a game with our number line. I say a number and you put this**

clothespin on that number on the number line. If you listen carefully and find the numbers, you'll earn one treasure coin. Are you ready? Find the number 8 on the number line.

(Student.)

If correct: **Great Job! You found 8 on the number line!**

If incorrect: **That's not quite right. This is 8 on the number line.** (Point to 8 on the number line.) **We can count to find the 8: 1, 2, 3, 4, 5, 6, 7, 8.** (Point to the numbers on the number line as you say them.) **Let's try it again. Find 8 on the number line.** (Student.)

- Module 5
- Part 2
- Activity #7 (cont.)



Let's try another one. Find the number 17. (Student.)

If correct: **That's great! You found 17!**

If incorrect: **Let's look at that together. This is 17 on the number line.** (Point to 17 on the number line.) **We can count to find the 17: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17.** (Point to the numbers on the number line as you say them.) **Let's try it again. Find 17 on the number line.** (Student.)

Let's try one more. Find the number 11. (Student.)

If correct: **Awesome! The number 11 is right there!**

If incorrect: **Look at that one more time. This is the number 11 on the number line.** (Point to 11 on the number line.) **We can count to find the 11: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.** (Point to the numbers on the number line as you say them.) **Let's try it again. Find 11 on the number line.** (Student.)

Nice job! You did a good job listening to directions and trying to find the numbers on the number line. You get 1 treasure coin.



Now, let's look at some addition problems and use the number line to find the answers. An addition problem has 2 or more numbers that you add together, or combine. The problems we'll work today have 2 numbers that you add together. One of the numbers is the *bigger number* and one of the numbers is the *smaller number*.

Look at this first problem. (Problem A.) This problem says 5 plus 3 equals blank. We can use our number line to solve a math problem like this. Put the clothespin on the bigger number. Which number is bigger, 5 or 3? (Student.) That's right, 5 is the bigger number. Put the clothespin on 5. (Place clothespin on 5.)

Once you put the clothespin on the bigger number, don't move it! This problem says 5 plus 3, so you add 3. To add 3, jump up 3 more numbers on the number line. Start on 5, and use your finger to jump up 3 numbers. 6 (Hold up 1 finger; use finger on other hand to move up on number line from 5 to 6.), 7 (Hold up 2 fingers; use finger to move up to 7.), 8 (Hold up 3 fingers; use finger to move up to 8.). So, 5 plus 3 equals what? (Student.) That's right! The answer is the last number you say. Put 5 in your head (point to your forehead); then count 3 more: 6, 7, 8. (Point to number line for each successive number and hold up an additional finger with each jump.) 8, the last number you say, is the answer. 8 is more than 5. When you add, you move this way, up the number line (use your finger to move in a positive direction on the number line). In an addition problem, your answer is always more than each of the numbers you add together.

Now, be careful! When you're jumping up the number line, don't count the number the clothespin is already on. Jump up to the next higher number. Let's practice counting up the number line.

- Module 5
- Part 2
- Activity #7 (cont.)



Look at this problem. (Problem B.) **4 plus 2 equals blank.** I put the clothespin on which number? (Student.) **Right.** We put the clothespin on the bigger number, 4. (Place the clothespin on the number 4.) **How many do we count up?** (Student.) **Okay.** Let's practice counting up from 4. Count up 2 more numbers. Put your finger on 4. Jump up to the next higher number and say, "5." (Student.) Jump up to the next number and say, "6." (Student.) You jump up two numbers and the last number you say is 6. So, 4 plus 2 equals 6. 6 is *more* than 4 and *more* than 2. When you add, you move *up* the number line (use your finger to demonstrate on the number line). In an addition problem, your answer is always *more* than each of the numbers you add together.

COUNTING UP Addition	COUNTING UP Subtraction
1. Put the bigger number in your head and say it.	1. Put the minus number in your head and say it.
2. Count up the smaller number on your fingers.	2. Count up your fingers to the number you started with.
3. Your answer is the last number you say.	3. Your answer is the number of fingers you have up.
To ADD, you can reverse the numbers!	To SUBTRACT, do not reverse the numbers! The minus number always goes first.
Example 1: 2 + 1	Example 1: 2 - 1
1. "2"	1. "2"
2. Hold up 1 finger "2"	2. Hold up 1 finger "2"
3. Hold up 2 fingers "3"	3. Hold up 2 fingers "2"
4. The answer is 3	4. The answer is 2

Another way to add two numbers together is by using your fingers. This is called "counting up." Sometimes when you add two numbers together, you know the answer right away in your brain, and that's great! But sometimes students your age don't know the answer right away. Counting up is a neat trick that will help you figure out the answer quickly. Look at this poster. (Show *Counting Up Addition* poster.) This poster shows the three steps to counting up for adding. Let's use these steps to solve 4 plus 2 equals blank. (Problem B.)

The first step says, "Put the bigger number in your head and say it." (Step 1.) Which number is the bigger number? (Student.) That's right! Start with the bigger number, 4. Put that number in your brain calculator and say, "4." (Student.)

Look at Step 2. (Step 2.) Step 2 says, "Count up the smaller number on your fingers." Now, count up 2 more, and use your fingers to keep track of how many you're adding. Watch me: 5 (hold up 1 finger), 6 (hold up 2 fingers). I knew I had to add 2 more to 4 (point to "+2" on the paper), so I used my fingers to make sure I counted up only 2 more (show students the 2 fingers still held up).

Now look at Step 3. (Step 3.) Step 3 says, "Your answer is the last number you say." Do you remember the last number I said out loud when I counted up on my fingers? (Student. If student says, "No," repeat Steps 1 and 2.) So, what's the answer to 4 plus 2? (Student.) That's right! 4 plus 2 equals 6.

Just like the number line, be careful! When you count up with your fingers, don't count the number you start with. That number goes in your brain. You have to add more fingers!

Watch me. I'll practice this problem. (Problem C.) **7 plus 3 equals blank.** I put the bigger number, 7, in my head. (Touch forehead and say, "7.") Then I count up 3 more: 8 (hold up 1 finger), 9 (hold up 2 fingers), 10 (hold up 3 fingers). 10, the last number I say, is the answer. I use my fingers to keep track of how many I'm adding. So, 7 plus 3 equals 10. 10 is *more* than 7 and *more* than 3. Your answer is always more than each of the numbers you add together.

- Module 5
- Part 2
- Activity #7 (cont.)



Before we solve the next problem, I want to show you one more thing on the *Counting Up* poster. (Point to bottom of poster.) One cool thing about addition problems is that the order of the numbers doesn't matter. This says, "To ADD, you CAN reverse the numbers!" For both of these problems, 5 plus 2 equals blank (point to " $5 + 2 = ?$ " on the poster) or 2 plus 5 equals blank (point to " $2 + 5 = ?$ " on the poster), you solve the problem the same way. (Follow the poster and demonstrate for the student.)

For addition problems, always start with the bigger number and count up the smaller number on your fingers. It's OK to reverse the order of the numbers so you always start with the bigger number.

Now, it's your turn again. Look at this problem. (Problem D.) This problem says 3 plus 4 equals blank. In this problem, the bigger number, 4, doesn't come first. You still solve the problem the same way, though. Use the poster to add 3 plus 4 on your fingers. (Point to Step 1.) Put the bigger number in your head and say it. (Point to Step 2.) Then, count up 3 more fingers. Use your fingers to keep track of how many you're adding. (Point to Step 3.) Your answer is the last number you say. Go ahead and do it now. (Student.)

If correct: **Awesome! What's the answer to 3 plus 4?** (Student.) **That's right. 3 plus 4 equals 7.**

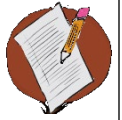
If incorrect: **Let's do this together. Put the bigger number, 4, in your head.** (Student.) **Add 3 more fingers and use your fingers to keep track of how many you're adding.** 5 (demonstrate), 6 (demonstrate), 7 (demonstrate). **Your answer is the last number you say. What's the answer to 3 plus 4?** (Student.) **Right! 3 plus 4 equals 7. Now, you try it.** (Allow student practice.)

Remember, when you add, the answer is always more than each of the numbers you add together. 7 is more than 3, and 7 is more than 4.

Let's try another addition problem. (Problem E.) This problem says 5 plus 8 equals blank. This is an addition problem, so the answer is more than each of the numbers you add together. Let's try counting up with 5 plus 8. Put the bigger number in your head and say it, 8. (Touch forehead and say, "8.") Now, count up 5 more and use your fingers to keep track of how many you're adding: 9 (hold up 1 finger), 10 (hold up 2 fingers), 11 (hold up 3 fingers), 12 (hold up 4 fingers), 13 (hold up 5 fingers). Your answer is the last number you say. So, what's the answer to 5 plus 8? (Student.) **That's right! 5 plus 8 equals 13. 13 is more than 5, and 13 is more than 8.**

Here's another addition problem. (Problem F.) This problem says 7 plus 9 equals blank. This is an addition problem, so the answer is more than each of the numbers you add together. Let's try 7 plus 9 using counting up on your fingers. Put the bigger number, 9, in your head. (Student.) Count up 7 more and use your fingers to keep track of how many you're adding. 10 (hold up 1 finger), 11 (hold up 2 fingers), 12 (hold up 3 fingers), 13 (hold up 4 fingers), 14 (hold up 5 fingers), 15 (hold up 6 fingers), 16 (hold up 7 fingers) Your answer is the last number you say. So, what's the answer to 7 plus 9? (Student.) **That's great! 7 plus 9 equals 16. 16 is more than 7, and 16 is more than 9.**

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- Activity #7 (cont.)



You did such a nice job with the addition problems. You get another treasure coin.



Now let's look at some subtraction problems. (Problem G.) A subtraction problem has 2 numbers: the *minus number* and the *number you start with*. The *minus number* is the number that comes right after the minus sign. The *minus number* is the number you take away. This problem says 8 minus 2 equals blank. That tells me 2 is the minus number. So in this problem, the minus number is 2. (Circle the number 2.) The *number you start with* is the number which you subtract the minus number from. In this problem, the number you start with is 8. (Point to the number 8.)

Let's practice finding the minus number in these subtraction problems. (Point to Problems H, I, J, and K.) Read each problem aloud and listen for the minus number. Take your pencil and draw a circle around the minus number in each subtraction problem. Remember, the minus number is the number that comes right after the minus sign. (Allow student to circle the 3, 3, 9, and 10. Assist, as needed.) Great job! You circled the minus number for each of these subtraction problems. The minus number is subtracted from the number you start with.

To use the number line with a subtraction problem, you can show the *difference* between two numbers. You find the minus number and the number you started with. Then, you count the spaces between the two numbers to find the difference.

Let's practice doing that. Look at this problem again. (Problem G.) This problem says, 8 minus 2 equals blank. One way to think about this subtraction problem is, what is the *difference* between 8 and 2? To find the answer using the number line, put one clothespin on the minus number, 2 (clip clothespin on the number 2), and one clothespin on the number you started with, 8 (clip clothespin on the number 8).

Now, to find the difference between these two numbers (draw a line with your finger between the 2 and the 8), we put our finger at 2 (point to the number 2) and count up the number of spaces until we get to 8: 3 (point to the number 3 and hold up 1 finger), 4 (point to the number 4 and hold up 2 fingers), 5 (point to the number 5 and hold up 3 fingers), 6 (point to the number 6 and hold up 4 fingers), 7 (point to the number 7 and hold up 5 fingers), 8 (point to the number 8 and hold up 6 fingers). The answer is the number of fingers you used to count up. So, 8 minus 2 equals 6, because the difference between 8 and 2 is 6.

Now, be careful! When you're counting up, don't count the minus number. The minus number goes in your head (point to forehead) and you start counting with the next higher number.

We solved this subtraction problem by finding the difference between the two numbers, 2 and 8 (Problem G). With subtraction, the answer is always *less* than the number you started with. The answer to this problem, 6, is less than the number you started with, 8.

You can also use counting up with your fingers to solve a subtraction problem, but it's different from counting up with addition. Look at this poster. (Show *Counting Up Subtraction* poster.) This poster shows the three steps for counting up for subtraction. Let's use these steps to solve 8 minus 2 equals blank. (Problem G.)

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The first step says, “Put the minus number in your head and say it.” (Step 1.) Which number is the minus number? (Student.) That’s right! The minus number comes right after the minus sign. Start with the minus number, 2. Put that number in your brain calculator and say, “2.” (Touch forehead and say, “2.”)

Look at Step 2. (Step 2.) Step 2 says, “Count up on your fingers to the number you started with.” Let’s count up with your fingers to find the answer to 8 minus 2. Watch me. Start with the minus number, 2, and then count up to the number you started with, 8. Then count how many fingers until you get to 8: 3 (hold up 1 finger), 4 (hold up 2 fingers), 5 (hold up 3 fingers), 6 (hold up 4 fingers), 7 (hold up 5 fingers), 8 (hold up 6 fingers).

Now look at Step 3. (Step 3.) Step 3 says, “Your answer is the number of fingers you have up.” How many fingers did I have to hold up until I counted up to 8? (Student.) So, what’s the answer to 8 minus 2? (Student.) That’s right! 8 minus 2 equals 6. The answer, 6, is less than 8. With subtraction, the answer is always less than the number you started with.

Before we solve the next problem, let me show you one more thing on the Counting Up poster. (Point to bottom of poster.) One very important thing to remember about subtraction problems is that the order of the numbers does matter. This says, “To SUBTRACT, do NOT reverse the numbers. The minus number always goes first.” For this problem, 5 minus 2 equals blank (point to “ $5 - 2 = ?$ ” on the poster), you have to solve the problem by starting with the minus number and counting up to the number you started with. If you don’t start with the minus number, your answer will not make sense. (Follow the poster and demonstrate for the student.) Remember, for addition problems, it’s OK to reverse the order of the numbers. But for subtraction problems, always start with the minus number and count up on your fingers until you get to the number you started with. It’s not OK to reverse the order of the numbers.


Let’s practice this problem. (Problem H.) Watch me. 10 minus 3 equals blank. What’s the minus number? (Student.) Right! The minus number is 3 (circle the 3). I put the minus number, 3, in my head. (Touch forehead and say, “3.”) Then I count how many fingers until I get to the number I started with, 10: 4 (hold up 1 finger), 5 (hold up 2 fingers), 6 (hold up 3 fingers), 7 (hold up 4 fingers), 8 (hold up 5 fingers), 9 (hold up 6 fingers), 10 (hold up 7 fingers). The answer is the number of fingers I have up. What’s the answer to 10 minus 3? (Student.) That’s right! So, 10 minus 3 equals 7. 7 is less than 10. In subtraction, the answer is always less than the number you started with.

We solved this subtraction problem by finding the difference between the two numbers, 3 and 10 (Problem H). With subtraction, the answer is always less than the number you started with. The answer to this problem, 7, is less than the number we started with, 10.

Look at this problem. (Problem I.) Try 6 minus 3 using your fingers and counting up. Use the Counting Up poster for subtraction to remind you of the steps. (Student.)

If correct: Perfect! You started with the minus number, 3, and counted up to the number you started with, 6. The answer is the number of fingers you have up. What’s the answer to 6 minus 3? (Student.) Nice! 6 minus 3 equals 3.

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If incorrect: **Let's try it together. Start with the minus number and count up to the number you started with. Which number is the minus number?** (Student.) **That's right. The minus number is the number that comes after the minus sign. Put the minus number, 3, in your head (touch forehead and say, "3"). Now count up on your fingers to the number you started with, 6: 4 (hold up 1 finger), 5 (hold up 2 fingers), 6 (hold up 3 fingers). The answer is the number of fingers you have up. What's the answer to 6 minus 3?** (Student.) **Great! So, 6 minus 3 equals 3.**

We solved this subtraction problem by finding the difference between the 2 numbers, 3 and 6. (Problem I.) With subtraction, the answer is always less than the number you started with. The answer to this problem, 3, is less than the number you started with, 6.

Let's try another subtraction problem. (Problem J.) This problem says 18 minus 9 equals blank. This is a subtraction problem, so the answer will be less than the number you start with. Count up to subtract 9 from 18. Put the minus number in your head and count up on your fingers to the number you started with. Start with the minus number, 9 (touch forehead), and count: 10, 11, 12, 13, 14, 15, 16, 17, 18 (hold up fingers as you count to demonstrate for student). The answer is the number of fingers you have up. What's the answer to 18 minus 9? (Student.) **Great! The answer is the number of fingers you have up. So, 18 minus 9 equals 9.**

Here's another subtraction problem. (Problem K.) This problem says 16 minus 8 equals blank. This is a subtraction problem, so the answer will be less than the number you start with. Count up to subtract 16 minus 8. Put the minus number in your head and count up on your fingers to the number you started with. The answer is the number of fingers you have up. Start with the minus number, 8 (touch forehead), and count: 9, 10, 11, 12, 13, 14, 15, 16 (assist student, as needed). Great! What's the answer to 16 minus 8? (Student.) **That's right. The answer is the number of fingers you have up. So, 16 minus 8 equals 8.**

You did such a nice job with the subtraction problems. You get another treasure coin! Thanks for working so hard counting up to solve math problems. We'll practice this more the next time we work together.



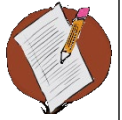
**ACTIVITY 4: SORTING CARDS
(BEGINS ON DAY 6)**

ACTIVITY 5: PIRATE PROBLEMS

NAME: _____		
PIRATE PROBLEMS - (DAY 1)		
7 + 4 = X	2 + 3 = X	5 + 8 = X
X = ____	X = ____	X = ____
2 + 1 = X	8 + 8 = X	9 + 9 = X
X = ____	X = ____	X = ____
1 + 4 = X	3 + 8 = X	7 + 3 = X
X = ____	X = ____	X = ____

The last activity we'll do every day is work on some math problems like these. (Show Pirate Problems Day 1.) On one side are number sentences where you have to be a pirate and find X. On the other side is a word problem where you need to use the Pirate Math strategies to find the answer.

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You have 2 minutes to work on the number sentences. Go ahead and get started. (Set timer for 2 minutes. At end of 2 minutes [or if student finishes early], move onto word problem.)

You have 2 minutes to work on the word problem. Go ahead. (Set timer for 2 minutes. At end of 2 minutes [or if student finishes early], go through all problems.)

Grading procedure for number sentences:

__ **plus/minus** __ equals __. To find X, (I rewrite and then) I add/subtract __ **plus/minus** __.
 If addition: I start with the **bigger number**, __, and count up the smaller number, __.
 (Count up.) The answer is the last number I said, __. __ **plus** __ equals __. So, X equals __.
 If subtraction: I start with the **minus number**, __, and count up to the number you start with, __. (Count up.) The answer is the number of fingers I used, __. __ **minus** __ equals __. So, X equals __.

Grading procedure for word problem:

(Read problem out loud.) **In this problem we:**

- If **Total**: show a total when 2 or more numbers are added together. This problem is a **Total problem**.
- If **Difference**: compare 2 numbers to find the difference. This problem is a **Difference problem**.
- If **Change**: show an increase/decrease in amount. This problem is a **Change problem**.

To solve it, we find the important information, cross out irrelevant information, write the number sentence, and solve for X. (Solve this problem quickly, without reteaching any concepts. USE COUNTING UP to find the answer to the number sentence.)

Good job! You got __ out of 10 correct. That score is written up here and you can take this with you today. You earn another treasure coin!



Let's count the number of coins you earned today and mark them on your treasure map. (Student.) **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!**

Good work for today!

How is the motivation system introduced?

How often is it used throughout the lesson?

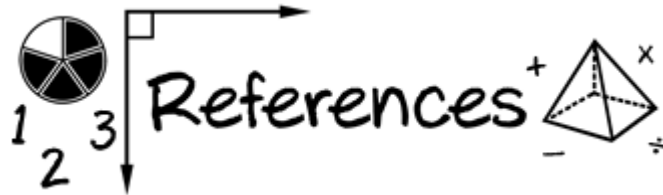


(1) Identify three different word problems from your grade level's assessment.

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(2) What attack strategy would you use to help students solve these problems?

(3) Which schemas need to be the focus of instruction?



Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A.,...Ogbuehi, P. (2012). *Improving mathematical problem solving in grades 4 through 8*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.