# **Teachers Guide**

# Volume 7 Module 3



# Module 3 Multiplicative Comparison Problems

#### **Major Instructional Targets**

- Solve multiplication and division problem situations with products and dividends to 100 involving situations of equal groups and arrays
- Solve for the unknown in a multiplication or division equation involving three whole numbers
- Solve problem situations involving a multiplicative comparison using multiplication or division

#### Planner

Session	Warm-Up 1 Warm-Up 2		Activity	
<b>11</b> Introducing Multiplicative Comparisons	Roll a Target	Multiply or Divide? Equal Groups	Dragon's Gold	
<b>12</b> Compare Problems, Total Unknown			Compare Problems, Total Unknown	
<b>13</b> Compare Problems, Number of Times as Many Unknown		Multiply or Divide? Arrays	Compare Problems, Number of Times as Many Unknown	
<b>14</b> Compare Problems, Reference Set Unknown			Compare Problems, Reference Set Unknown	
Assessment Skills & Concepts	Assessed			
Session 15 Progress Monitoring 7-3	<ul> <li>Solve division problem situations with dividends to 100 involving situations of arrays</li> <li>Solve for the unknown in a multiplication or division equation involving three whole numbers</li> <li>Solve problem situations involving a multiplicative comparison using multiplication or division</li> </ul>			

### Recommended Grade Level for Starting Intervention

- Mid grade 4
- See also Volumes 5 and 6

#### **Materials Preparation**

Туре	Items & Notes		Done					
Copies	Make copies of each print original according to the instructions at the top of the page.							
Cards & Mats	If you are making cards and mats from the component originals, refer to the pages noted below for information about copying and assembly. <b>Graphic Organizer 1</b> C1 <b>Graphic Organizer 2</b> C4 <b>Number Cards</b> C2–C3 <b>Graphic Organizer 3</b> C5 You'll need specially prepared sets of Number Cards for activities in this module. To prepare these sets, remove the 1s, 2s, 10s, and wild cards from a deck, so you have 4 of each card 3–9 in each set. You'll use one set for group use in Sessions 11 and 12, and a set for each pair of students in Sessions 13 and 14.							
Items from Previous Modules	Multiply or Divide? Chart This chart is created from student input in Session 9. While not strictly necessary for activities in this module, it is helpful for reference and support. If your students are begin- ning in this module and thus did not help create such a chart, consider spending a few minutes having them help you make one before beginning this module. See Module 2, Session 9 for more information.	Multiply or Divide? • If you know how many groups, and how many in each group, you probably have to multiply. • If you know the total and the number of rows, but you have to figure out how many in each row, it's a divide problem. • If the problem says the total, it's probably division. If you have to figure out the total, it's probably multiplication.						

See the Preparation section of the Volume 7 Introduction for information about general classroom materials, game supplies, and math manipulatives needed for activities in this and other modules.

# Session 11 Introducing Multiplicative Comparisons

#### Materials

Cards & Mats	Other Materials	Print Originals
<ul> <li>Number Cards (1 deck, 3s–9s only)</li> <li>Graphic Organizer 1 (1 for display)</li> <li>Graphic Organizer 3 (1 for display)</li> </ul>	<ul> <li>one 1–6 die and one 4–9 die</li> <li>Multiply or Divide? chart from Session 9 (see Materials Preparation at beginning of this module)</li> <li>student whiteboards, markers, and erasers</li> <li>blue and red dry-erase markers, 1 each</li> <li>spinner overlay</li> </ul>	P1 Dragon's Gold Record Sheet P2-P3 More Games of Dragon's Gold

Copy instructions are located at the top of each print original.

### Warm-Up 1 Roll a Target

Remove the 0s, 1s, 2s, 10s, and wild cards from a deck of Number Cards. You'll also need a 1–6 die and a 4–9 die.

- 1 Show students the prepared Number Cards and let them know there are four of each number, 3–9. Then shuffle the deck and place it face-down. Explain the game Roll a Target.
  - A player on one team rolls the two dice and arranges them to form a 2-digit target number.
  - Then each team draws two cards and multiplies the numbers. The team with the product closest to the 2-digit target number, either over or under, takes all four cards.
  - Play continues until all cards have been used; the team with more cards wins.
- 2 Play the game, teacher versus students, until all the cards have been used. (You'll have enough for 7 rounds.)

**Student** OK, I rolled an 8 and a 1. I think I'm going to put them so they make 18.

**Teacher** *I got a 5 and a 5. What is my product? How did you solve that?* **Students** Five times 5 is 25.

We got a 5 and 4, so that's 20.

We get to take all 4 cards because 20 is closer to 18 than 25!



### Instructional Goals

Solve multiplication and division problem situations with products and dividends to 100 involving situations of equal groups

### Warm-Up 2 Multiply or Divide? Equal Groups

You'll need an Equal Groups Problems graphic organizer and dry-erase markers in red and blue. Display the Multiply or Divide? chart for students' reference.

- 1 Explain that you'll read a problem situation. Students will tell you where to enter the information on the organizer, and why. Then they'll write an equation to match.
- 2 Share the first problem:

Anika and her two little brothers, Dev and Jai, are visiting their grandmother. Today they went to the park. When they got there, they saw some children on skateboards. Dev said there were 28 wheels in all. How many skateboards did they see?

- 3 Ask students:
  - What information do we know?
  - Where does each piece of information fit on the graphic organizer?
  - What is the unknown?

**Student** Twenty-eight wheels is the total, so you should write it there. **Student** Skateboards have 4 wheels, so that's the number in each group.

**Student** I don't get it. That would mean we have to figure out the number of groups, but a skateboard isn't a group!

**Student** Well, it kind of is ... it's like every skateboard is a group of 4 wheels. So, you should make a red box for number of groups.



4 Ask students to write and solve an equation to represent the information you entered on the organizer. Invite volunteers to share their thinking with the group. Press students to explain how they decided which operation to use.

**Student** I wrote 28 divided by 4, and I got 7 for my answer.

**Teacher** *Why did you use division to solve this problem?* 

**Student** Because we were trying to figure out the number of groups. We knew the total, and we knew how many were in each group, so we had to find out how many 4s in 28. You have to do division for that.

5 Repeat steps 2–4 with the following problems.

They were surprised to find 4 different play structures on the playground. They were even more surprised when Dev announced that there were exactly 9 children on each structure. How many children were there in all? [Number of Groups: 4; Number in Each Group: 9; Total: Unknown;  $4 \times 9 =$ \_\_\_\_, 36 children]

After they had played on the swings for awhile, they started exploring the little trail next to the playground. They discovered something they'd never seen before—acorns! They picked up as many as they could find—24 in all—and decided to divide them evenly among themselves. How many acorns did each of the three children get? [Number of Groups: 3; Number in Each Group: Unknown; Total: 24;  $24 \div 3 =$ \_\_\_\_, 8 acorns each]

### Activity Dragon's Gold

You'll need a die numbered 1–6, a spinner overlay, a Dragon's Gold Record Sheet for each student, and a Compare Problems graphic organizer.

During this game, you will introduce a graphic organizer designed to help students understand and solve multiplication and division problem situations involving multiplicative comparison. See the introduction for more information about this problem type and the related organizer.

- 1 Let the students know that they are going to work as a team to play a game called Dragon's Gold. Give each student a record sheet and display the Compare Problems graphic organizer where everyone can see it. Ask them what they notice and wonder about the graphic organizer and record sheet. Explain the rules of the game.
  - Teams take turns rolling a die, spinning a spinner, and recording the results.
  - The spinner is labeled with statements of multicative comparison: 2 times as many, 3 times as many, and so on. If a team rolls a 5 and lands on the section of the spinner labeled *4 times as many*, they multiply 5 times 4 to get a score of 20 for that round.
  - After 4 rounds, each team totals their points; high score wins.
- 2 Take the first turn, using the organizer to record your results.
  - Roll the die and record the number rolled on the organizer as the *Reference Set*.
  - Invite a student to spin the spinner for you. Record the result in the blank provided, and check off that many boxes to show that you'll multiply the reference set that many times.
  - Work with student input to write an equation to match the display. Have them give the answer, and invite volunteers to explain their thinking.
  - Finally, enter the total in the space provided.



3 Invite a student to roll and spin for the group. Then support students in recording the results of their turn on their record sheets.

- 4 Continue to take turns with the students until you've played four rounds. You will need to wipe your graphic organizer between each turn and record your products on the board to keep track of them, while students will be able to record all of their turns on the same sheet.
- 5 At the end of the game, work with student input to find the sum of your four products. Then ask them to find the sum of their products. Finally, have the group compare the two sums to determine the winner.

### Practice Page More Games of Dragon's Gold

Assign a More Games of Dragon's Gold Practice Page.

Read the instructions and review the example at the top of the page. Complete the first problem with the students, and support them as needed in completing the other two.

# Session 12 Compare Problems, Total Unknown

#### Materials

Cards & Mats	Other Materials	Print Originals
<ul> <li>Number Cards (1 deck, 3s–9s only)</li> <li>Graphic Organizer 1 (1 for display)</li> <li>Graphic Organizer 3 (1 per student</li></ul>	<ul> <li>one 1–6 die and one 4–9 die</li> <li>Multiply or Divide? chart</li> <li>student whiteboards, markers, and erasers</li> <li>blue and red dry-erase markers, 1 each per</li></ul>	<b>P4–P5</b> Training for
and 1 for display)	student and teacher	a Marathon

Copy instructions are located at the top of each print original.

### Warm-Up 1 Roll a Target

1 Have students work as a team to play Roll a Target against you. Follow the game rules and procedures described in Session 11, Warm-Up 1.

### Warm-Up 2 Multiply or Divide? Equal Groups

- 1 Following procedures described in Session 11, Warm-Up 2, work with students to record key information and solve equations for the problem situations below. Ask:
  - » What information do we know?
  - » What are we trying to find?
  - » Where does this information go in the organizer?
  - » What equation matches this problem?
  - » How will you solve it?
  - » How did you decide which operation to use?
  - » Is your answer reasonable?

Today, the Patel family—Anika, Dev, Jai, Grandma, and also Anika's mom and dad—are going to the zoo. If the zoo charges \$8 for admission, how much will it cost for the 6 of them to get in? [Number of Groups: 6; Number in Each Group: \$8; Total: Unknown;  $6 \times 8 =$ \_\_; \$48]

It costs \$3 to ride on the Zoo Train. Mr. Patel paid \$12 at the ticket booth. How many Zoo Train tickets did he buy? [Number of Groups: Unknown; Number in Each Group: \$3; Total: \$12;  $12 \div 3 =$ \_\_; 4 Zoo Train tickets]

They had lunch at the Zoo Café. It cost \$42 for the 6 of them, and everyone's lunch cost exactly the same amount. How much did each lunch cost? [Number of Groups: 6; Number in Each Group: Unknown; Total:  $$42; 42 \div 6 = __; $7 per lunch]$ 

### **Instructional Goals**

Solve multiplication and division problem situations with products and dividends to 100 involving situations of equal groups

Write a multiplication equation to represent a multiplicative comparison

### Activity Compare Problems, Total Unknown

- 1 Let students know that they'll solve some problem situations today. Display a Compare Problems graphic organizer. Ask them what they remember about what a graphic organizer is.
- 2 Share the first problem:

Mateo was playing a game of Dragon's Gold with his friend Dustin. On his first turn, Mateo rolled a 4 and spun 3 times as many. What was Mateo's total for that round?

3 Work with student input to enter the information in blue on the Compare Problems organizer.

#### **Reference Set: 4**

**Teacher** In the game of Dragon's Gold, *what does the number you roll on the die tell?* 

**Student** It's kind of like the starting number, and then you spin to find out how much you get to times it by.

**Teacher** That's right. The roll of the die gives you the starting number. We call it a *reference set* because we have to refer to it—pay attention to it—to get the total. If the dragon's spinner says you get 3 times as many, you have to know 3 times as many as what. *So, what is the reference set in this problem? Do we know?* 

Student It's 4 because that's what he got for his dice roll.



#### Times as Much/Many: 3

**Teacher** What does the spinner tell you in this game?

**Student** It tells the times as many. He landed on 3 times as many, so you have to write a 3 where it says that.

**Student** And you have to make checks in 3 of the boxes, so it's kind of like 3 fours.

**Teacher** Yes, that's right. Three times as many as 4 means the same thing as 3 times 4, and the checkmarks help us remember that. *So, what's the unknown in this problem? What are we trying to figure out?* 

Student How much he got on his first turn.

Teacher OK, I'll use a red box to show that our unknown is the total.

Graphic Organizer 3 Compare F	roblems	Equation:
0 The Math Learning Center	WATER SOLUBLE MARKERS ONLY	qciam

A graphic organizer is a tool people use to record and organize information so they can see and work with it more easily. This particular organizer is helpful in solving multiplication and division problem situations that involve comparisons. 4 Work with student input to write and solve an equation to match the display. Read the equation to the group as a comparison statement: *3 times as many as 4 is 12*. Then record the total in the red box.



5 Give each student a Compare Problems organizer and markers in red and blue. Repeat steps 2–4 with the problem below, and have the students work on their organizers as you work on yours.

Dustin rolled a 6 and spun 5 times as many when it was his turn. What was his total for that round?  $[5 \times 6 = ]$ , 30 points]

- 6 Next, have students read the equation as a comparison statement.
  - Write the following sentence frame on the board: \_\_\_\_ times as many as \_\_\_\_ is \_\_\_\_
  - Fill it in with student input and read it aloud with the students.

5 times as many as 6 is 30

7 Ask students to erase their mats as you erase yours. Then pose a problem that involves a situation unrelated to the game of Dragon's Gold.

After they finished playing Dragon's Gold, Mateo and Dustin decided to play a video game. After just a few minutes, Dustin had 20 points, and Mateo had 4 times as many points as that. How many points did Mateo have?

8 Read the problem again, and record the key information on the board. Ask: Which piece of information represents the reference set? Which piece of information represents the number of times as many? Press them to justify their responses.

> 20 points 4 times as many as that

**Students** Twenty points has to be the starting number.

Yeah, that's the number that you have to go 4 times as many as.

9 Repeat the process described in steps 2–4 to organize the information and solve the problem with the group.

When you are finished, have students read the equation as a comparison statement: *4 times as many as 20 is 80*.

Reference	<sub>Set</sub> 20	)		Equation:	
times as much/many	$\overline{\mathbf{A}}$			4 × 20	) = (80)
Total:	)				_

10 Repeat steps 7–9 with the following problems.

By the end of the video game level, Mateo had 300 points and Dustin had 3 times as many points as that. How many points did Dustin have?  $[3 \times 300 = \___, 900 \text{ points}]$ 

Then the boys went into the kitchen to get some baby carrots for a snack. Dustin ate 9 of the carrots. Mateo ate 2 times as many carrots as Dustin. How many baby carrots did Mateo eat?  $[2 \times 9 = \_$ , 18 baby carrots]

Dustin stopped at the store to pick up something for his mom on the way home. It took him 5 minutes to walk from Mateo's house to the store. It took him 3 times that long to walk from the store to his house. How long did it take Dustin to walk from the store to his house?  $[3 \times 5 = \_\_, 15 minutes]$ 

### Practice Page Training for a Marathon

Assign a Training for a Marathon Practice Page.

Read the instructions and review the example at the top of the page. Complete the first problem with the students, and support them as needed in completing the other one.

# Session 13 Compare Problems, Number of Times as Many Unknown

#### Materials

Cards & Mats	Other Materials	Print Originals
<ul> <li>Number Cards (1 deck per student pair, 3s–9s only)</li> <li>Graphic Organizer 2 (1 for display)</li> <li>Graphic Organizer 3 (1 per student and 1 for display)</li> </ul>	<ul> <li>1-6 dice, 1 die per student pair</li> <li>4-9 dice, 1 die per student pair</li> <li>Multiply or Divide? chart</li> <li>student whiteboards, markers, and erasers</li> <li>blue and red dry-erase markers, 1 each per student and teacher</li> </ul>	<b>P6–P7</b> Video Games

Copy instructions are located at the top of each print original.

### Warm-Up 1 Roll a Target

- 1 Students will play Roll a Target in pairs today. If students have played this game previously, ask them to review and share the rules of the game. If this game is new to the students, explain the rules to them.
  - Each pair gets 2 dice (one 4–9 and one 1–6) and and a prepared deck of Number Cards.
  - One player rolls the dice and arranges them in either order to form a 2-digit target number.
  - Each player draws two cards and multiplies the numbers. The player with the product closest to the 2-digit target number, either under or over, takes all 4 cards.
  - Players continue in this fashion until time is called or they've used all their cards. The player with more cards at the end of the game wins.
- Pair students, distribute materials, and have students play the game.
   After 3 minutes, have students count and compare their cards to determine a winner.

## Warm-Up 2 Multiply or Divide? Arrays

You'll need an Array Problems organizer and markers in red and blue. Display the Multiply or Divide? chart created in the last module for students' reference.

- 1 Explain that you're going to read a problem situation. Ask:
  - What is the important information?
  - Where does it fit in the graphic organizer?
  - How do you know?
  - What are we trying to find out?
  - What equation matches this problem?
- 2 Share the first problem:

The Patels are spending a quiet day at Grandma's house today. Dev and Anika are going to play chess.

Dev said, "Hey, Anika ... do you know there are 64 squares on a chessboard?"

Anika said, "Yes I do! I also know that the 64 squares are arranged into 8 rows. Do you know how many squares there are in each row?"

"Umm...no, but I can figure it out," said Dev.

### **Instructional Goals**

Solve multiplication and division problem situations with products and dividends to 100 involving situations of arrays

Solve for the unknown in a multiplication equation involving 3 whole numbers

Solve problem situations involving a multiplicative comparison using multiplication

Have the students guide you in entering the known information on the organizer and identifying the unknown.

**Student** Put 64 in the middle for the total—that's how many squares in all.

**Student** It's 8 for the number of rows, and a red box for how many in each row, because that's what you have to figure out.



Ask students to write and solve an equation to represent the information on the organizer. Invite volunteers to share their thinking with the group.
 Press students to explain how they decided which operation to use.

**Student** You have to divide. It doesn't make sense to multiply on this one.

**Teacher** Why doesn't it make sense? Why do you have to divide?

**Student** Because you know there are 64 squares on the board, and they're in 8 rows, so if you divide by 8 it tells you how many there are in every row.

4 Repeat the process with the following problems:

Jai is helping Grandma make a quilt. They have finished all the quilt squares, and now they're going to stitch the squares together in 6 rows, with 8 squares in each row. How many quilt squares is that in all? [Number of Rows: 6; Number in Each Row: 8; Total: Unknown;  $6 \times 8 =$ \_\_\_; 48 quilt squares in all]

Later in the afternoon, Dev decided to lay out his entire collection of basketball cards on the floor. He has 84 cards and he wants to arrange them in rows, with 12 in each row. How many rows can he make? [Number of Rows: Unknown; Number in Each Row: 12; Total: 84;  $84 \div 12 =$ \_\_; 7 rows]

### Activity Compare Problems, Number of Times as Many Unknown

1 Let students know that they'll solve some more comparison problems today. Then share the first problem:

Last week, Kyra and Ariel went to the sporting goods store. Kyra said, "Let's play the high/low game. We choose something to look for. Then you find the most expensive one and I find the least expensive one, and we compare them." Ariel said, "OK! That sounds like fun!"

They started by looking at hair ties. They found a pack of fancy pink hair ties for \$15 and a pack of multicolored hair ties for \$5. How many times as much as the multicolored ties did the pink ties cost?

2 Read the problem again, and work with student input to record the key information on the board.

> Pink hair ties \$15 Multicolored hair ties \$5

- 3 Then give each student a Compare Problems organizer, and have them use its labels to help determine what each piece of information represents.
  - Explain that the labels on the mat show the three parts of a comparison problem situation—the reference set, the number of times as many, and the total.
  - Remind students that a problem situation has to supply two of the parts, leaving the third for the problem-solver to figure out.
- 4 Work with student input to record the information on your mat. Use blue to show the known information, and red to highlight the unknown part. Then write a multiplication equation to represent the situation, and ask students to explain how the equation matches the problem situation.



**Student** The girls are trying to figure out how many times more the pink ties cost than the multicolored ties, so I've written an equation to match: "15 is how many times as much as 5?"

5 Give students time to solve the problem mentally. Then invite volunteers to share and explain their thinking. Record the completed equation, and work with students to restate it in the context of the problem.



**Teacher** *Fifteen is 3 times as many as 5, which in our story would mean what?* 

Students The pink ties were \$15 and the other ones were \$5.

What you wrote is like saying the pink ties cost 3 times as much as the multicolored ties.

#### Questioning Strategies

Questions to ask for student input include:

What is the key information?

Where does it fit in the graphic organizer?

How do you know?

What are we trying to find out?

What equation matches this problem?

Is your answer reasonable?

#### Volume 7 Module 3 Session 13

6 Distribute blue and red markers. Repeat steps 1–5 with the problems below, and have the students work on their organizers as you work on yours.

Then Kyra and Ariel looked at the footballs. They found an NFL official football for \$100 and a VS football for \$20. How many times as much as the VS football did the NFL football cost?  $[100 = \_\_ \times 20$ , five times as much]

After that, they looked at catcher's mitts. The most expensive one was \$250, and the least expensive was \$50. How many times as much as the least expensive catcher's mitt did the most expensive mitt cost?  $[250 = \_\_ \times 50$ , five times as much]

Next, they looked at soccer balls. They found an official match ball for \$160 and a practice ball for \$20. How many times as much as the practice ball did the official match ball cost? [ $160 = \_ \times 20$ , eight times as much]

Finally, they looked at basketballs. They found an official NBA ball for \$140, and a varsity basketball for \$14. How many times as much as the varsity basketball did the NBA ball cost? [140 =  $\_$  × 14, ten times as much]

### Practice Page Video Games

Assign a Video Games Practice Page.

Read the instructions and review the example at the top of the page. Complete the first problem with the students, and support them as needed in completing the other one.

# Session 14 Compare Problems, Reference Set Unknown

#### Materials

Cards & Mats	Other Materials	Print Originals
<ul> <li>Number Cards (1 deck per student pair, 3s–9s only)</li> <li>Graphic Organizer 2 (1 for display)</li> <li>Graphic Organizer 3 (1 per student and 1 for display)</li> </ul>	<ul> <li>1-6 dice, 1 die per student pair</li> <li>4-9 dice, 1 die per student pair</li> <li>Multiply or Divide? chart</li> <li>student whiteboards, markers, and erasers</li> <li>blue and red dry-erase markers, 1 each per student and teacher</li> </ul>	<b>P8–P9</b> More Collections

Copy instructions are located at the top of each print original.

### Warm-Up 1 Roll a Target

Explain that students will play Roll a Target in pairs again today.
 Follow the game rules and procedures described in Session 13, Warm-Up 1.

### Warm-Up 2 Multiply or Divide? Arrays

- 1 Following questioning strategies described in Session 13, Warm-Up 2, work with students to record key information and solve equations for the problem situations below.
  - Read the problem situation to the group. Work together to record information from the problem on the Array Problems organizer, identifying the unknown with a red box.
  - Have students write and solve an equation to match on their whiteboards, then invite volunteers to share. Press them to explain how they decided what operation to use.

Anika and her grandma went to the Farmer's Market. At the first stall, they saw 7 rows of juicy peaches, 8 peaches in each row. How many peaches in all? [Number of Rows: 7; Number in Each Row: 8; Total: Unknown;  $7 \times 8 =$ \_\_\_; 56 peaches]

In the next stall, they saw ears of corn in rows of 10. Anika quickly figured out that there were 120 ears of corn in all. How many rows were there? [Number of Rows: Unknown; Number in Each Row: 10; Total: 120;  $120 \div 10 =$ \_\_\_\_, 12 rows]

Later, they saw a man unpacking jars of jam and honey to sell. He arranged 36 jars of honey into 4 equal rows. How many jars were in each row? [Number of Rows: 4; Number in Each Row: Unknown; Total: 36;  $36 \div 4 = \_\_; 9$  jars in each row]

## Activity Compare Problems, Reference Set Unknown

1 Ask students what they learned about compare problem situations in the previous sessions. *What does it mean to compare two things? What strategies did we use to solve the compare problem situations?* Share the first problem:

Yesterday, Mr. Harold went to the mall to buy some new clothes. He got a new pair of tennis shoes for \$45. The shoes cost 5 times as much as the T-shirt he got at another store. How much did the T-shirt cost?

2 Ask students to identify the key information and the problem to be solved.

Shoes cost \$45 5 times as much as a T-shirt How much did the T-shirt cost?

#### **Instructional Goals**

Solve multiplication and division problem situations with products and dividends to 100 involving situations of arrays

Solve for the unknown in a multiplication or division equation involving three whole numbers

Solve problem situations involving a multiplicative comparison using multiplication or division 3 Work with student input to transfer the information to your Compare Problems organizer. Then ask them how they might go about solving the problem.



#### Teacher How can we find out how much Eric's T-shirt cost?

**Students** It says the shoes cost 5 times as much as the T-shirt, so we could multiply 5 times 45.

But wait! That would be more than \$200! A T-shirt doesn't cost that much!

If the shoes are 5 times as much as the T-shirt, then the T-shirt costs way less than the shoes, right?

We would have to go 5 times as many as something is 45, I think. The "something" would be how much it cost for the T-shirt.

#### 4 Ask students:

- What equation matches this problem?
- Where do you see the key information in the equation?
- How did you solve this problem?
- What is your answer?
- Is it reasonable?
- Did anyone do it differently?



5 Repeat the process with the problems below, having students work on their organizers as you work on yours.

Mr. Harold also bought got a jacket for \$60. That was 3 times as much as the new pants he got. How much did the pants cost?  $[3 \times \_\_] = 60 \text{ or } 60 \div 3 = \_\_]$ , \$20]

Finally, Mr. Harold got a hoodie for \$40. That was 4 times as much as the shorts he got on sale. How much did the shorts cost?  $[4 \times \_\_ = 40 \text{ or } 40 \div 4 = \_\_, $10]$ 

When he finished shopping for clothes, he went to the toy store. He got a new game and a puzzle for his students. The game cost \$15, which was 3 times as much as the puzzle. How much did the puzzle cost?  $[3 \times \_\_] = 15$  or  $15 \div 3 = \_\_$ , \$5]

He also bought a stuffed animal and a box of sparkle markers. The stuffed animal, which was \$12 on sale, cost 2 times as much as the markers. How much did the markers cost?  $[2 \times \_\_] = 12$  or  $12 \div 2 = \_\_]$ , \$6]

Finally, he bought a train set and a tiny teddy bear. The train set cost \$12, which was 4 times as much as the bear. How much did the teddy bear cost?  $[4 \times \_\_ = 12 \text{ or } 12 \div 4 = \_\_, $3]$ 

# Multiplication or Division?

While this problem can be solved using either multiplication or division, students will likely choose multiplication as they try to make sense of a situation that involves 5 times as many. If no one suggests using division to solve the problem, guide them to understand that the situation can be represented and solved both ways.

### Practice Page More Collections

Assign a More Collections Practice Page.

Read the instructions and review the example at the top of the page. Complete the first problem with the students, and support them as needed in completing the other one.

# Session 15 **Progress Monitoring 7-3**

#### Materials

Cards & Mats	Other Materials	Print Originals
<ul> <li>Graphic Organizer 1 (1 for interview)</li> <li>Graphic Organizer 2 (1 for interview)</li> </ul>	• blue and red dry- erase markers, 1 each	<ul> <li>P10 Progress Monitoring 7-3 Interview Story</li> <li>P11 Progress Monitoring 7-3 Record Sheet</li> <li>P12 Progress Monitoring 7-3 Scoring Guide</li> <li>Student Progress Monitoring Record, Volume 7 (Module 1 Print Originals, P1)</li> </ul>

Copy instructions are located at the top of each print original.

### Part 1 Written Progress Monitoring

Give each student a copy of the Progress Monitoring 7-3 Record Sheet. Read the instructions and problems to the group, clarifying as needed. When students understand what to do, give them time to complete the problems as you pull individuals aside one at a time to do the interview task with you.

### Part 2 Individual Interview

Interview each student individually as the others complete the written tasks and go on to do a game or practice page from a previous session.

- 1 Set out the Equal Groups Problems and Array Problems graphic organizers, along with blue and red dry-erase markers.
- 2 Read the problem on the Progress Monitoring 7-3 Interview Story sheet to the student, and set it out on the table for the student's reference.

Mrs. Johnson's class has received 18 postcards from other schools around the world. They are going to hang the postcards on the bulletin board. They want to arrange the postcards so there are 6 postcards in each row. How many rows can they make?

3 Ask the student to choose the organizer that matches the problem situation type. Then have the student complete the steps listed below.

If you need to reread the problem to the student in the process, that's fine.

- Enter the known information on the organizer in blue, and draw a red box on the line beside the unknown part.
- Write and solve an equation to represent the problem in the box provided.
- Explain how they decided which operation to use-multiplication or division.
- Write the answer in the red box on the organizer and label it with the correct units.



17

#### Instructional Goals

Solve division problem situations with dividends to 100 involving situations of arrays

Solve for the unknown in a multiplication or division equation involving three whole numbers

Solve problem situations involving a multiplicative comparison using multiplication or division Volume 7 | Module 3 Session 15

### Scoring

Use the Progress Monitoring 7-3 Scoring Guide to determine scores. Use copies of the Student Progress Monitoring Record (found in the Module 1 Print Originals) to track individual students' progress.

Bridges Intervention | Teachers Guide

# **Print Originals**

Volume 7 Module 3



DATE



# More Games of Dragon's Gold Version A

Cole and Deja are playing a game of Dragon's Gold. Help them record their results.

**ex** On his first turn, Cole rolled a 5 and spun *7 times as many*. What was his total for that turn?



1 On her first turn, Deja rolled a 4 and spun 9 *times as many*. What was her total for that turn?



**2** Next, Cole rolled a 6 and spun 8 *times as many*. What was his total for that turn?



**3** Then, Deja rolled a 3 and spun 4 *times as many*. What was her total for that turn?



# More Games of Dragon's Gold Version B

Jade and Luis are playing a game of Dragon's Gold. Help them record their results.

**ex** On her first turn, Jade rolled a 2 and spun 6 *times as many*. What was her total for that turn?



**1** On his first turn, Luis rolled a 5 and spun *3 times as many*. What was his total for that turn?



**2** Next, Jade rolled a 4 and spun *7 times as many*. What was her total for that turn?



**3** Then, Luis rolled a 6 and spun 9 *times as many*. What was his total for that turn?



# Training for a Marathon Version A

Read each problem below and record information on the organizer. Then solve the problem, circle the answer, and label it with the correct units. Write an equation to match.

**ex** Dan and his mom are training to run a marathon next month. Last week, they ran 10 kilometers. This week, they ran 3 times that many kilometers. How many kilometers did they run this week?



1 Dan is swimming laps at the pool as part of his training. Last week, he swam 100 laps. This week, he wants to swim 2 times that many laps. How many laps would that be?



**2** Dan's mom has been riding a bike as part of her training. Last month, she rode 30 miles. This month, she rode 4 times as many miles. How many miles did she ride this month?

Referen	ce Set:	Equat	ion:
times as many			
Total:	v 		
Multiply.			
9 × 10 =	4 × 20 =	3 × 30 =	2 × 50 =

# E Training for a Marathon Version B

Read each problem below and record information on the organizer. Then solve the problem, circle the answer, and label it with the correct units. Write an equation to match.

**ex** Shelly lives next door to Dan. Shelly and her dad are also training to run the marathon. Last week, they ran 20 kilometers. This week, they ran 2 times that many kilometers. How many kilometers did they run this week?



1 Shelly is swimming laps at the pool as part of her training. Last week, she swam 50 laps. This week, she wants to swim 4 times that many laps. How many laps would that be?



2 Shelly's dad has been riding a bike as part of his training. Last month, he rode 40 miles. This month, he rode 3 times as many miles. How many miles did he ride this month?

Referenc	e Set:	Equation	on:
times as many			
Total:			
Multiply.			
7 × 10 =	5 × 20 =	2 × 30 =	2 × 40 =

3

# **Wideo Games** Version A

Read each problem below and record the information on the organizer. Solve the problem and circle the answer on the organizer. Then write a sentence to explain the answer.

**ex** Jacob is playing a video game with his sister Amy. After the first few minutes, Jacob had 100 points and Amy only had 25. How many times more points did Jacob have than Amy?



1 When the level was half over, Amy had 600 points and Jacob only had 300. How many times more points did Amy have than Jacob?

		Refe	rence S	Set:				Explanatior	1:
times as									
many	`								
	I	otal: _							

**2** At the end of the level, Amy lost points, and Jacob gained points. The final score was Jacob, 900 points and Amy, 300 points. How many times more points did Jacob have than Amy?

F	Reference Set:	Explanation:	
times as many			
Tot	tal:		
Multiply.			
20 × 30 =	$30 \times 30 =$	$20 \times 40 =$	20 × 50 =

P6

# **Wideo Games** Version B

Read each problem below and record the information on the organizer. Solve the problem and circle the answer on the organizer. Then write a sentence to explain the answer.

**ex** Taylor played a video game against the computer. At the end, Taylor had 30 points and the computer had 150 points. How many times more points did the computer get than Taylor?



1 At the end of the second round, Taylor had 150 points and the computer only had 50 points. How many times more points did Taylor get than the computer?



**2** At the end of the third round, Taylor had 400 points and the computer only had 100 points. How many times more points did Taylor get than the computer?

R	eference Set:	Explanation:			
times as many			]		
Tota	al:				
Multiply.					
30 × 40 =	$30 \times 60 =$	$40 \times 40 =$	$40 \times 50 =$		

P7

# More Collections Version A

Read each problem below and record the information on the organizer. Then solve the problem, circle the answer on the organizer, and label it with the correct units. Write a multiplication equation and a division equation to match.

**ex** Kiara has 3 times as many teddy bears as bunny rabbits in her collection of stuffed animals. She has 15 teddy bears. How many bunny rabbits does Kiara have?



1 Cody has 4 times as many football cards as baseball cards in his collection of sports trading cards. He has 80 football cards. How many baseball cards does Cody have?



**2** Jenna has 2 times as many agates as crystals in her rock collection. She has 30 agates. How many crystals does Jenna have?

Reference Set:	Equations:
times as many	
Total:	
Divide.	
30 ÷ 3 = 80 ÷ 10 =	60 ÷ 2 = 50 ÷ 5 =

# More Collections Version B

Read each problem below and record the information on the organizer. Then solve the problem, circle the answer on the organizer, and label it with the correct units. Write a multiplication equation and a division equation to match.

**ex** Jamal has 3 times as many president stamps as bird stamps in his stamp collection. He has 75 president stamps. How many bird stamps does Jamal have?



1 Kaitlin has 5 times as many pennies as quarters in her coin jar. She has 100 pennies. How many quarters does Kaitlin have?



**2** Miguel has 6 times as many cars as trucks in his collection of models. He has 54 cars. How many trucks does Miguel have?

Refere		Equations:			
times as many					
Total:	v				
Divide.					
40 ÷ 10 =	70 ÷ 7 =	 90 ÷ 9 =	=	100 ÷ 4 =	

want to arrange the postcards so there are 6 postcards in each row. How many rows the world. They are going to hang the postcards on the bulletin board. They postcards from other schools around Mrs. Johnson's class has received 18

**Progress Monitoring 7-3 Interview Story** 

# Progress Monitoring 7-3 Record Sheet

Read each problem below. Then:

- Record the information on the organizer.
- Solve the problem.
- Circle the answer on the organizer, and label it with the correct units.
- Write an equation (multiplication or division, depending on the problem) to match.
- 1 Emma played her favorite video game twice. She scored 200 points the first time. She scored 3 times that many points the second time. How many points did she score the second time?

	Reference Set:						Equation:				
times as											
many	`	Total:									

**2** Darius has 5 times as many basketball cards as football cards. He has 50 basketball cards. How many football cards does he have?



g Guide	əmsN tnəbut2			rmation in the correct locations labeled with correct units lication equation that accurately situation	mation in the correct locations labeled with correct units n or multiplication equation that e problem situation		vo knowns and the unknown in graphic organizer n or multiplication equation that e problem thoice of operation in a way that tanding of the problem, e.g., "1 is wanted to divide up the cards sw," OR "I chose multiplication ands and he wanted 6 in each what number times 6 is 18 to is he could make."	
J-3 Scoring		Scoring		<ul> <li>3 pts.:</li> <li>1 pt. for placing the information on the organizer</li> <li>1 pt. for correct answer, labele</li> <li>1 pt. for writing a multiplication represents the problem situation</li> </ul>	<ul> <li>3 pts.:</li> <li>1 pt. for placing the information on the organizer</li> <li>1 pt. for correct answer, labele</li> <li>1 pt. for writing a division or n accurately represents the proc</li> </ul>		<ul> <li>4 pts. possible:</li> <li>1 pt. for recording the two kn correct locations on the graph correct locations on the graph accurately represents the probact of the probact state in the probact of the probact states and understanding the choice demonstrates an understanding the choice division because he ware so there were 6 in each row," C because there were 18 cards a row, so 1 thought about what r figure out how many rows he</li> <li>1 pt. for correct answer, labele</li> </ul>	10 pts.
Progress Monitoring		Skill Assessed	Part 1 Written Progress Monitoring	<ol> <li>Solves a "Compare, Unknown Product" problem situation: enters information on an organizer, solves problem, circles answer and labels it with correct units, writes an equation to match. <i>Reference Set</i>: 200; Times as Many: 3; Total/Unknown: 600 points; 3 × 200 = 600 or 200 × 3 = 600</li> </ol>	<b>2</b> Solves a "Compare, Reference Set Unknown" problem situation: enters information on an organizer, solves problem, circles answer and labels it with correct units, writes an equation to match. <i>Reference Set/Unknown: 10 football cards; Times as Many: 5; Total: 50; 50 <math>\div</math> 5 = 10 or 5 × 10 = 50</i>	Part 2 Individual Interview	1 Identifies a problem situation by type, enters information and the unknown on the corresponding graphic organizer, writes and solves an equation to represent the problem, explains choice of operation, and records answer labeled with correct units on the organizer. <i>Arrays Problem; Number of Rows: Unknown, Number in</i> <i>Each Row. 6, Total: 18, 18 + 6 = 3 (6 × 3 = 18 or 3 × 6 = 18 are</i> <i>also acceptable); Explanations will vary; 3 rows</i>	TOTAL SCORE