



Lesson 6: More Division Stories

Student Outcomes

- Students demonstrate further understanding of division of fractions by creating their own word problems.
- Students choose a partitive division problem, draw a model, find the answer, choose a unit, and set up a situation. They also discover that they must try several situations and units before finding which ones are realistic with given numbers.

Lesson Notes

This lesson is a continuation of Lesson 5 and focuses on asking students to write fraction division story problems that are partitive in nature.

Classwork

Opening (5 minutes)

Provide students a few minutes to share the division stories they wrote for the previous lesson's problem set. Clarify any misconceptions that surface regarding the process of creating story problems when using measurement division.

Discussion (5 minutes)

- Partitive division is another interpretation of division problems. What do you recall about partitive division?
 - We know that when we divide a whole number by a fraction, the quotient will be greater than the whole number we began with (the dividend). This is true regardless of whether we use a partitive approach or a measurement approach.*
 - We know what the whole is and how many groups we are making, but must figure out what size the groups are.*

Scaffolding:

Paper fraction tile strips can be pre-cut for students who have difficulty making accurate sketches.

Example 1 (10 minutes)

- Today, we will work with partitive division.
- Step 1: Let's use an example that uses partitive division: $50 \div \frac{2}{3}$.

Example 1

Divide $50 \div \frac{2}{3}$.

Step 1: Decide on an interpretation.

The interpretation, partitive division, is given in this problem.

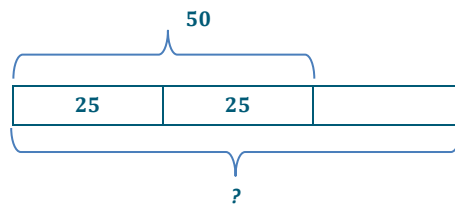
- Step 2 is to draw a model. How many equal sized rectangles do we need? How do you know?
 - The denominator of the fraction tells us we are using thirds. We need 3 rectangles in the whole unit.

Step 2: Draw a model.



- The 50 accounts for how many of those 3 rectangles?
 - It accounts for two because the numerator tells us how many thirds that the 50 represents.
- So, the 50 must be spread out evenly between two thirds. How many would be in each box?
 - 25

Step 2: Draw a model.



- Step 3 is to find the answer. $50 \div \frac{2}{3}$ means 50 is $\frac{2}{3}$ of some number that is greater than 50. By looking at our tape diagram, we can see that $25 = \frac{1}{3}$ of the number.

Step 3: Find the answer.

By looking at our tape diagram, we see that $50 \div \frac{2}{3} = 25 \cdot 3 = 75$.

Step 4: Choose a unit.

Answers will vary, but dollars will be used throughout the discussion below.

Step 5: Set up a situation.

Answers will vary, but there is a story problem provided in the discussion.

- Now that we have the answer, we can move on to the fourth step, choosing a unit. Let's choose dollars.
- Step 5 is to set up a situation. Remember that this means writing a story problem that includes all of the information necessary to solve it and that is also interesting, realistic, short, and clear. It may take several attempts before you find a story that works well with the given dividend and divisor.
- Spending money gives a "before and after" word problem. We are looking for a situation where $\frac{2}{3}$ of some greater dollar amount is \$50.

- One story problem that might go well with these numbers is the following: Adam spent \$50 on a new graphing calculator. This was $\frac{2}{3}$ of his money. How much money did he start with?

Exercise 1 (5 minutes)

Allow students to work with a partner to create the story problem. Also, take time to share and discuss their work.

Exercise 1

Using the same dividend and divisor, work with a partner to create your own story problem. You may use the same unit, dollars, but your situation must be unique. You could try another unit, such as miles, if you prefer.

Possible story problems:

- Ronaldo has ridden 50 miles during his bicycle race and is $\frac{2}{3}$ of the way to the finish line. How long is the race?
- Samantha used 50 tickets ($\frac{2}{3}$ of her total) to trade for a kewpie doll at the fair. How many tickets did she start with?

Example 2 (10 minutes)

- Step 1: Let's use an example that uses partitive division: $45 \div \frac{3}{8}$.

Example 2

Divide $45 \div \frac{3}{8}$.

Step 1: Decide on an interpretation.

The interpretation, partitive division, is given in this problem.

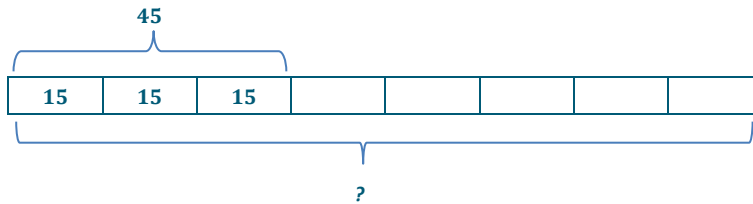
- Step 2 is to draw a model. How many equal sized rectangles do we need? How do you know?
 - The denominator of the fraction tells us we are using eighths. We need to partition the whole into 8 equal sized rectangles.*

Step 2: Draw a model.



- The 45 accounts for how many of those 8 rectangles?
 - It accounts for three because the numerator tells us how many eighths that the 45 represents.*
- So, the 45 must be spread out evenly among three eighths. How many would be in each box?
 - 15

Step 2: Draw a model.



- Step 3 is to find the answer. $45 \div \frac{3}{8}$ means 45 is $\frac{3}{8}$ of some number that is greater than 45. By looking at our tape diagram, we can see that $15 = \frac{1}{8}$ of the number.

Step 3: Find the answer.

By looking at our tape diagram, $45 \div \frac{3}{8} = 15 \cdot 8 = 120$.

Step 4: Choose a unit.

Answers will vary, but carnival prize tickets will be used throughout the discussion below.

Step 5: Set up a situation.

Answers will vary, but there is a story problem provided in the discussion.

- Now that we have the answer, we can move on to the fourth step, choosing a unit. Let's choose carnival prize tickets.
- Step 5 is to set up a situation. Remember that this means writing a story problem that includes all of the information necessary to solve it and that is interesting, realistic, short, and clear. It may take several attempts before you find a story that works well with the given dividend and divisor.
- One story problem that might go well with these numbers is the following: Scott gave away 45 carnival prize tickets to his niece. This was $\frac{3}{8}$ of his tickets. How many tickets did he start with?

Exercise 2 (5 minutes)

Allow students to work with a partner to create the story problem. Also, take time to share and discuss their work.

Exercise 2

Using the same dividend and divisor, work with a partner to create your own story problem. Try a different unit. Remember, spending money gives a "before and after" word problem. If you use dollars, you are looking for a situation where $\frac{3}{8}$ of some greater dollar amount is \$45.

Possible story problems:

- Daryl has been on a diet for 45 days and is $\frac{3}{8}$ of the way to the end of the diet program. How long is the program?*
- Amy collected 45 Box Tops for Education, which is $\frac{3}{8}$ of her goal. What is the total number she is trying to collect?*

Closing (3 minutes)

- How did we extend our work with division with fractions in this lesson?
 - *We took an answer to a partitive division problem, added a unit, and then thought of a story problem that would fit it.*
- What were your biggest challenges when writing story problems involving division with fractions?
 - *Accept all answers.*

Exit Ticket (2 minutes)

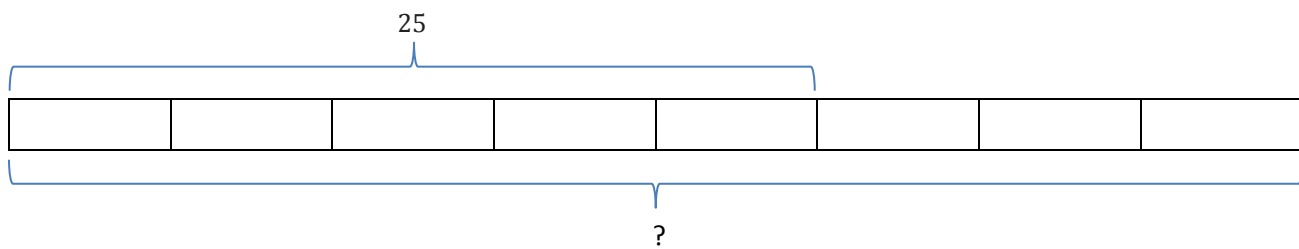
Name _____

Date _____

Lesson 6: More Division Stories

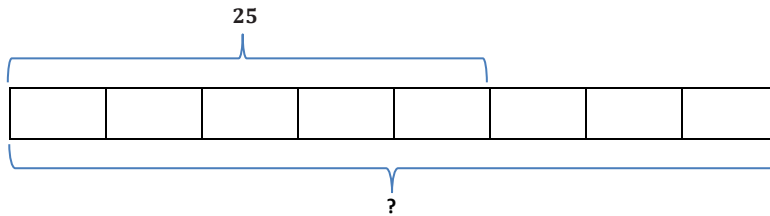
Exit Ticket

Write a word problem for the following partitive division: $25 \div \frac{5}{8} = 40$.



Exit Ticket Sample Solutions

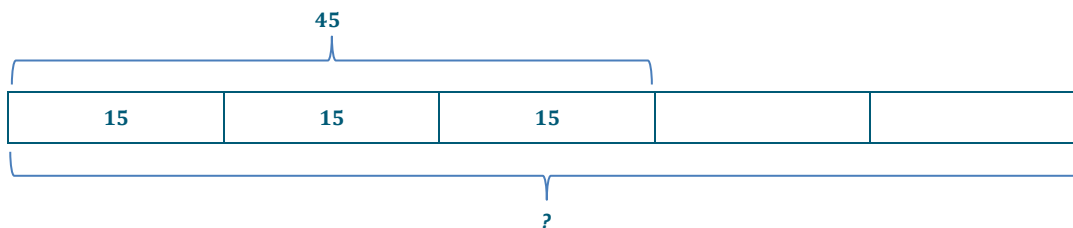
Write a word problem for the following partitive division: $25 \div \frac{5}{8} = 40$.



Zolanda spent $\frac{5}{8}$ of her class period, or 25 minutes, taking notes. How long was the class period? (Accept any other reasonable story problem showing $25 \div \frac{5}{8} = 40$.)

Problem Set Sample Solutions

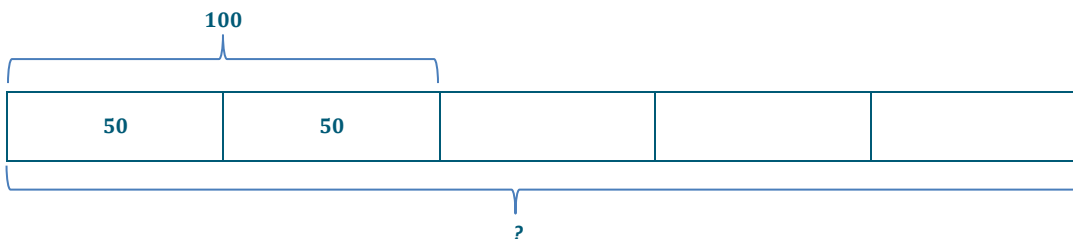
1. Write a partitive division story problem for $45 \div \frac{3}{5}$.



Answers may vary, but an example of a division story is provided.

Samantha Maria spent $\frac{3}{5}$ of her money, or \$45, on a pair of earrings. How much money did she have before she bought the earrings?

2. Write a partitive division story problem for $100 \div \frac{2}{5}$.



Answers may vary, but an example of a division story is provided.

There are 100 girls in the college marching band, which is $\frac{2}{5}$ of the total. How many members are there all together in the band?