Explore Multiplying with 0, 1, 2, 5, and 10

Previously, you learned about the meaning of multiplication. This lesson will take a closer look at certain multiplication facts. Use what you know to try to solve the problem below.

Jenny draws 6 cartoon bugs. Each bug has 10 legs. How many legs did she draw?

Learning Targets

- Apply properties of operations as strategies to multiply and divide.
- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.

SMP 1, 2, 3, 4, 5, 6, 8

TRY IT

Math Toolkit

- base-ten blocks
- counters
- hundred charts
- multiplication models

DISCUSS IT

Ask your partner: How did you get started?

Tell your partner: A model I used was . . . It helped me . . .

CONNECT IT

1 LOOK BACK

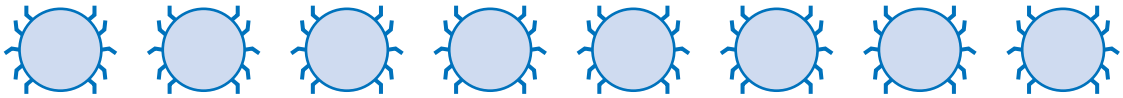
Explain how you found the number of legs Jenny drew for the 6 cartoon bugs.

2 LOOK AHEAD

You can show and solve multiplication problems in different ways, such as using arrays or equal groups.

One way to find products when multiplying with 2, 5, or 10 is to use skip-counting.

Suppose Jenny draws 8 cartoon bugs with 10 legs each.



a. Show how you could use skip-counting to find the number of legs Jenny drew.

10, 20, ...

b. Write a multiplication fact to find the number of legs.

number of bugs × legs on each bug = total number of legs

..... × ..... = ...

3 REFLECT

Suppose you have 8 bugs with 8 legs each. What other method besides skip-counting can you use to find the total number of legs?

.....

.....

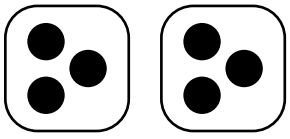
Prepare for Multiplying with 0, 1, 2, 5, and 10

1 Think about what you know about multiplication. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.

My Definition	My Illustrations
Examples	Non-Examples

multiplication fact

2 What multiplication fact is shown by the model?



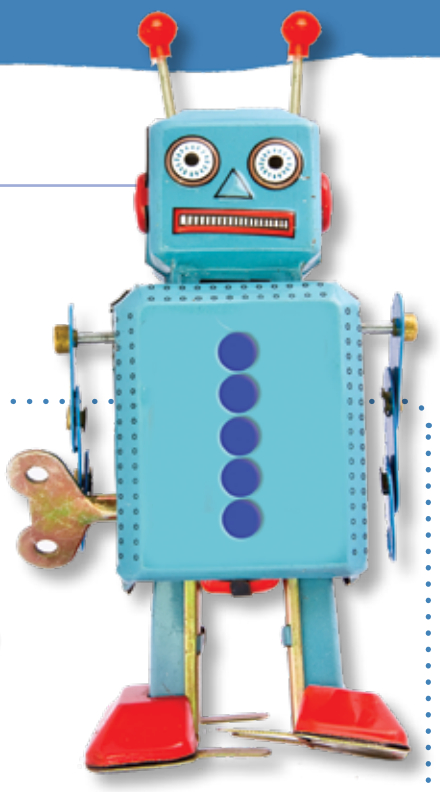
3 Solve the problem. Show your work.

Julio makes 7 cookies. Each cookie has 5 chocolate chips. How many chocolate chips did he use?

Solution

4 Check your answer. Show your work.

Develop Multiplying with 2, 5, and 10



Read and try to solve the problem below.

A company makes a toy robot that has 2 antennas and 5 buttons. How many antennas and buttons are needed for 6 robots?

TRY IT

Math Toolkit

- counters
- cups
- 1-centimeter grid paper
- multiplication models

DISCUSS IT

Ask your partner: Why did you choose this strategy?

Tell your partner: I started by . . .

Explore different ways to understand multiplying with 2, 5, and 10.

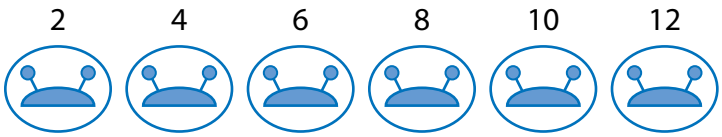
A company makes a toy robot that has 2 antennas and 5 buttons. How many antennas and buttons are needed for 6 robots?

MODEL IT

You can use equal groups and skip-count.

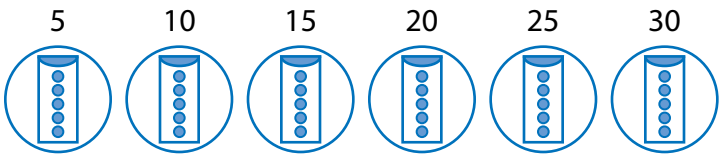
The drawings show the antennas and buttons of **6** robots.

You can skip-count by **twos** to find the number of antennas.



6 groups of **2** antennas

You can skip-count by **fives** to find the number of buttons.

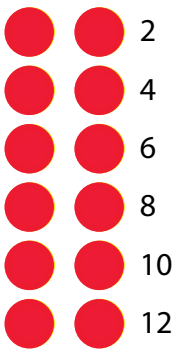


6 groups of **5** buttons

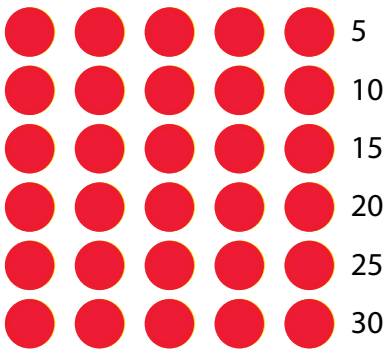
MODEL IT

You can use arrays and skip-count.

The left array shows the number of antennas. You can skip-count by **twos**.
The right array shows the number of buttons. You can skip-count by **fives**.



6 rows of **2** antennas



6 rows of **5** buttons

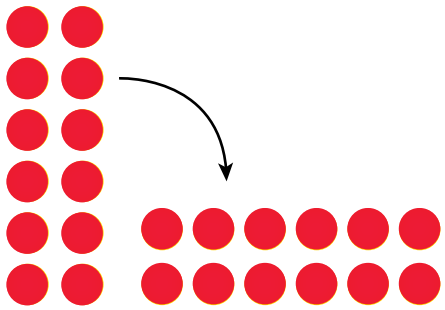
CONNECT IT

Now you will use the problem from the previous page to help you understand how to multiply with 2, 5, and 10.

1. Look at both **Model Its**. What multiplication equations can you write for the number of antennas and number of buttons?

2. How do both models use skip-counting?

3. If you take the antenna array in the second **Model It** and turn it, what would the equation be for each array?



4. Did the order of the factors in problem 3 change the product? Explain why or why not.

5. What addition doubles fact can you write for the turned array in problem 3? Why can you use a doubles fact when you multiply with 2?

6 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for multiplying with 2 and 5? Explain.

APPLY IT

Use what you just learned to solve these problems.

7 How much is 5 groups of 10? Write a multiplication equation. Show your work.

Solution

8 How much is 10 groups of 5? Write a multiplication equation. Show your work.

Solution

9 Each cabin at camp has 5 beds. There are 4 cabins. How many beds are there at camp? Show your work.

Solution

Practice Multiplying with 2, 5, and 10

Study the Example showing how to multiply with 5. Then solve problems 1–5.

EXAMPLE

Wes has 3 rows of tomato plants. There are 5 plants in each row. How many tomato plants does Wes have in all?

$3 \times 5 = 15$. Wes has 15 tomato plants.

1 Circle equal groups of 2. Then fill in the blanks to show the multiplication fact.

_____ groups of _____ is _____, so _____ × _____ = _____.

2 Each box of pencils has 10 pencils. Write a multiplication fact for 8, 9, and 10 boxes of pencils.

a. 8 boxes: _____ × 10 = _____ pencils

b. 9 boxes: _____ × _____ = _____ pencils

c. 10 boxes: _____ × _____ = _____ pencils

3 Cole arranges his blueberries into different arrays before he eats them. Write a multiplication fact for each array.

a. 

....

b. 

.....

4 Fill in the blanks to complete the multiplication facts for 2.

$0 \times 2 =$ ..... $6 \times 2 =$ .....

$1 \times 2 =$ ..... $7 \times 2 =$ .....

$2 \times 2 =$ ..... $8 \times 2 =$ .....

$3 \times 2 =$ ..... $9 \times 2 =$ .....

$4 \times 2 =$ ..... $10 \times 2 =$ .....

$5 \times 2 =$ .....

5 Fill in the blanks to complete the multiplication facts for 5.

$0 \times 5 =$ ..... $6 \times 5 =$ .....

$1 \times 5 =$ ..... $7 \times 5 =$ .....

$2 \times 5 =$ ..... $8 \times 5 =$ .....

$3 \times 5 =$ ..... $9 \times 5 =$ .....

$4 \times 5 =$ ..... $10 \times 5 =$ .....

$5 \times 5 =$ .....

Develop Multiplying with 0 and 1

Read and try to solve the problem below.

Jon says 6 × 1 = 6. Jeff says 6 × 0 = 6. Who is right? Explain how you know.

TRY IT

Math Toolkit

- counters
- cups
- number lines
- 1-centimeter grid paper

DISCUSS IT

Ask your partner: Can you explain that again?

Tell your partner: I do not understand how . . .

Explore different ways to understand multiplying with 0 and 1.

Jon says $6 \times 1 = 6$. Jeff says $6 \times 0 = 6$. Who is right? Explain how you know.

MODEL IT

You can use equal groups to understand multiplying with 1.

6×1 means there are 6 groups with 1 in each group.

MODEL IT

You can use equal groups to understand multiplying with 0.

6×0 means there are 6 groups with 0 in each group. A group of 0 is empty.

CONNECT IT

Now you will use the problem from the previous page to help you understand how to multiply with 1 and 0.

1. Look at the first **Model It** for 6 × 1. There are _____ groups of _____, so 6 × 1 = _____. Is Jon right? _____.

2. Draw the first **Model It** and add another group of 1.

   Now there are _____ groups of 1, so _____ × 1 = _____.

3. What do you notice about the number of groups and the product when you multiply 6 × 1? 7 × 1?

4. Look at the second **Model It** for 6 × 0. There are _____ groups of _____, so 6 × 0 = _____. Is Jeff right? _____.

5. Explain what would happen if more groups of 0 were added.

6. What do you think is true about the product of any number multiplied by 1? Multiplied by 0?

7 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for multiplying by 1 and 0? Explain.

APPLY IT

Use what you just learned to solve these problems.

8 Fill in the missing numbers to complete each fact.

a. $5 \times 0 =$ _____

b. _____ $\times 1 = 5$

c. $3 \times$ _____ $= 0$

d. $3 \times 1 =$ _____

9 Which of the following facts have a product of 0?

Ⓐ $1 \times 0 = ?$

Ⓑ $0 \times 1 = ?$

Ⓒ $10 \times 1 = ?$

Ⓓ $5 \times 1 = ?$

Ⓔ $5 \times 0 = ?$

10 Draw a model to show 4×0. Then find the product.

$4 \times 0 =$ _____

Practice Multiplying with 0 and 1

Study the Example showing how to multiply with 1. Then solve problems 1–4.

EXAMPLE

Steve uses a model to create a list of multiplication facts for 1. He starts with 0 equal groups of 1 and then keeps adding a group of 1 for each fact as shown. Describe a pattern he can use to find the 1s facts for 6, 7, 8, 9, and 10.

$0 \times 1 = 0$	
$1 \times 1 = 1$	★
$2 \times 1 = 2$	★ ★
$3 \times 1 = 3$	★ ★ ★
$4 \times 1 = 4$	★ ★ ★ ★
$5 \times 1 = 5$	★ ★ ★ ★ ★

Steve can see that any number times 1 equals that number.

$6 \times 1 = 6$
$7 \times 1 = 7$
$8 \times 1 = 8$
$9 \times 1 = 9$
$10 \times 1 = 10$

The number of groups of 1 is the same as the product.

1 Create a model of 7×1 and 1×7. How are they different? How are they the same?

Solution

2 Jenna makes a table to show the school supplies she has. Write a multiplication fact to show how many of each school item Jenna has.

Materials	Number of Boxes	Multiplication Fact
Box of 8 crayons	0	
Box of 10 pencils	1	
Box of 5 erasers	1	
Box of 6 markers	0	

3 Is each multiplication fact correct?

	Yes	No
$1 \times 0 = 1$	Ⓐ	Ⓑ
$9 \times 1 = 0$	Ⓒ	Ⓓ
$0 \times 5 = 0$	Ⓔ	Ⓕ
$6 \times 0 = 6$	Ⓖ	Ⓗ

4 Xavier starts to create a list of multiplication facts for 1. Explain the mistake he is making. What will make his facts correct?

$1 \times 1 = 2$

$2 \times 1 = 3$

$3 \times 1 = 4$

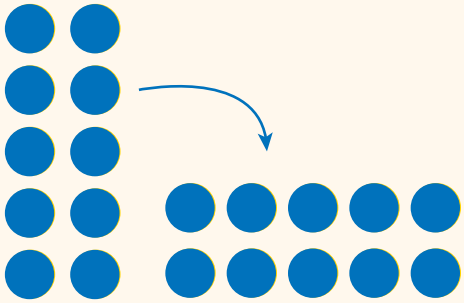
Refine Multiplying with 0, 1, 2, 5, and 10

Complete the Example below. Then solve problems 1–9.

EXAMPLE

Liam says 2 × 5 has the same product as 5 × 2. Do you agree?

Look at how you could show your work using an array.



5 × 2 = 10 2 × 5 = 10

Solution

Liam created 5 rows of 2 and 2 rows of 5.

PAIR/SHARE
How can you find the total once you create an array?

APPLY IT

1 Find 7 × 2. Then find 8 × 2 and 9 × 2 using the same model. Explain the pattern you see in the products. Show your work.

How many are in each group?

Solution

PAIR/SHARE
How did finding all three facts with the same model help you see the pattern?

2 Rami has 1 bag with 7 apples, 8 bags with 0 oranges, and 3 bags with 10 peaches. How many apples, oranges, and peaches does Rami have? Show your work.

Think about what you know about multiplying with 0 and 1.

PAIR/SHARE

How are your models the same as your partner's models? How are they different?

Solution

3 Which of the following equals 10?

Ⓐ 2×5

Ⓑ 5×5

Ⓒ 10×0

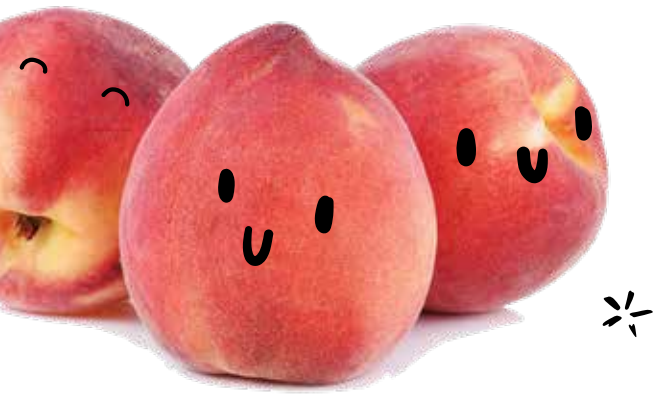
Ⓓ 1×9

Find the product of each choice first.

Rey chose Ⓒ as the correct answer. How did he get that answer?

PAIR/SHARE

What strategy for multiplying do you like best?



4 Which factor will correctly complete all of the following facts:

$1 \times \_\_\_\_ = 1$ $2 \times \_\_\_\_ = 2$ $3 \times \_\_\_\_ = 3$ $4 \times \_\_\_\_ = 4$

Ⓐ 0

Ⓑ 1

Ⓒ 2

Ⓓ 10

5 Fill in the blanks to complete the multiplication facts for 10.

$0 \times 10 =$ ..... $6 \times 10 =$ .....

$1 \times 10 =$ ..... $7 \times 10 =$ .....

$2 \times 10 =$ ..... $8 \times 10 =$ .....

$3 \times 10 =$ ..... $9 \times 10 =$ .....

$4 \times 10 =$ ..... $10 \times 10 =$ .....

$5 \times 10 =$ .....

6 Is each multiplication fact *True* or *False*?

	True	False
$7 \times 2 = 14$	Ⓐ	Ⓑ
$10 \times 0 = 10$	Ⓒ	Ⓓ
$1 \times 10 = 10$	Ⓔ	Ⓕ
$5 \times 0 = 5$	Ⓖ	Ⓗ
$2 \times 1 = 2$	Ⓘ	Ⓙ
$3 \times 10 = 30$	Ⓚ	Ⓛ

7 Emile has 4 packs of shirts. Each pack has 2 shirts. He also has 2 packs of shorts. Each pack has 3 shorts. Does he have more shirts or shorts? Show your work.

Solution

8 Principal Green talks to 5 different students every school day. How many students does she talk to in 10 school days?

Noa says this is a 10 groups of 5 problem and can be solved by multiplying 10×5 or skip-counting by fives 10 times. Sara says this problem can be solved by skip-counting by tens 5 times or finding 5×10. Who is correct? Explain and provide the answer.

9 MATH JOURNAL

Explain how you would solve the problem below. What multiplication fact could you use?

Lauren paints 8 paintings. She puts 2 trees in each painting. How many trees does Lauren paint?

SELF CHECK Go back to the Unit 2 Opener and see what you can check off.

Explore How Multiplication and Division Are Connected

How are multiplication and division related?

Learning Target

- Understand division as an unknown-factor problem.

SMP 1, 2, 3, 4, 5, 6, 7

MODEL IT

Solve the problems below.

1 **a.** Draw an array of 4 rows of 3 pennies to the right.

b. Write a multiplication equation for your array.

c. Now break your array into 4 equal groups. Write a division equation for this array.

d. What three numbers do both equations use? Tell what each number represents.

2 The result of division is called the **quotient**. Circle the quotient in your division equation in problem 1c. Circle the same number in your multiplication equation in problem 1b. Did you circle a factor or the product in your multiplication equation?

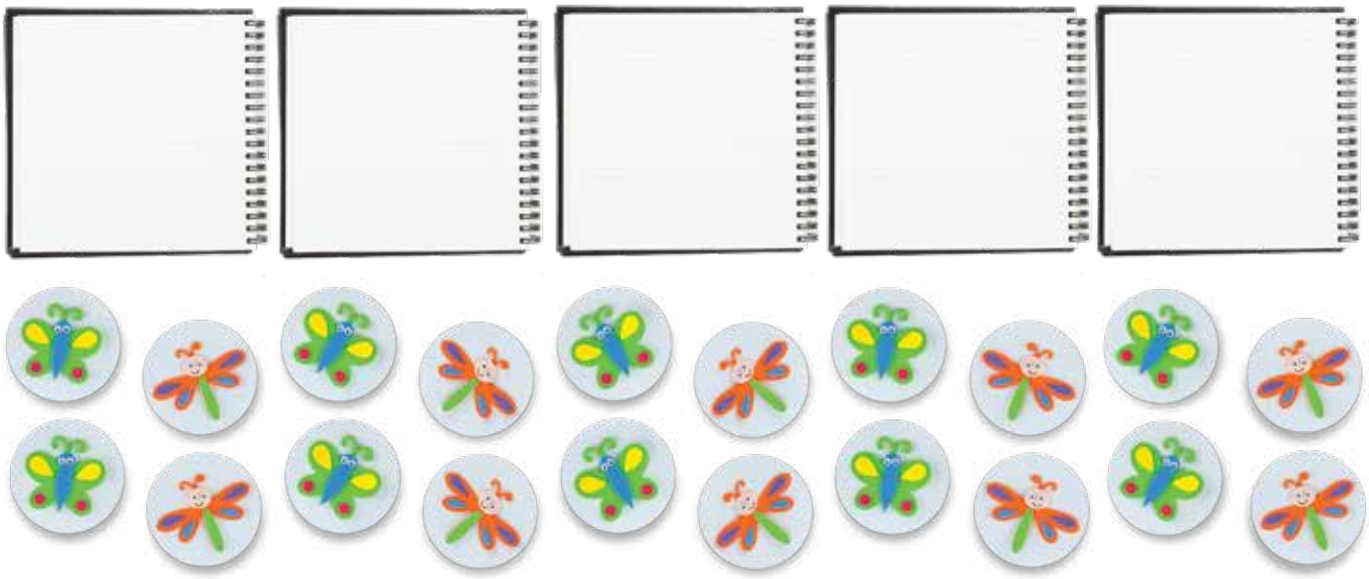
DISCUSS IT

- How do you and your partner think the multiplication and division equations are alike and different?
- I think multiplication and division are related because . . .

MODEL IT

Complete the problems below.

3 Nick buys 20 stickers. He puts the same number of stickers on each of 5 pages in his scrapbook. Draw the stickers Nick puts on the pages. Write a division equation and a multiplication equation for this problem.



Division equation: .....

Multiplication equation: .....

4 Explain how you could use a multiplication equation to find 20 ÷ 5.

DISCUSS IT

- What numbers are used in both the multiplication and division equations in problem 3? What do the numbers mean?
- I think I can use multiplication to help me divide because . . .

5 REFLECT

How is division doing the reverse of multiplication?

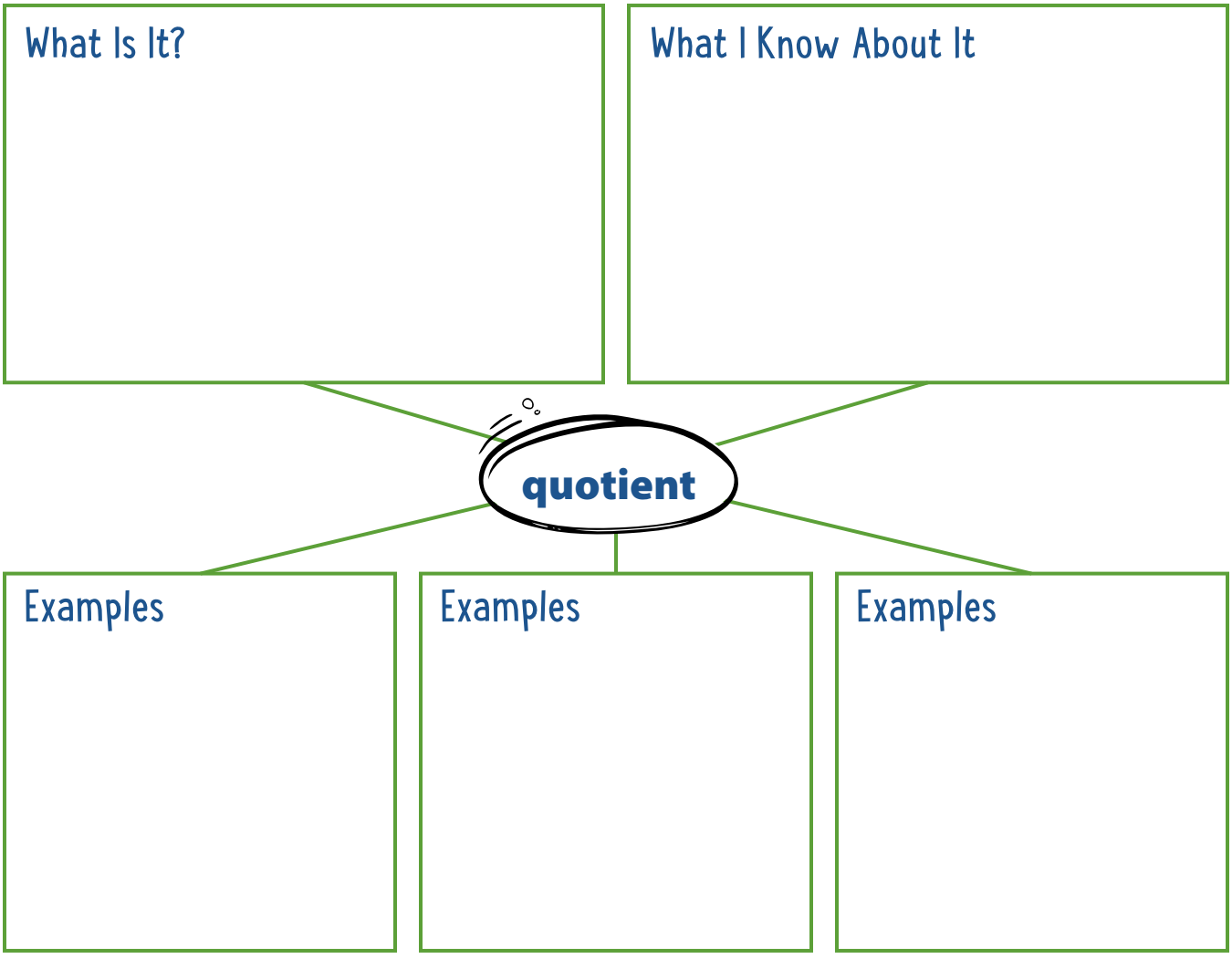
.....

.....

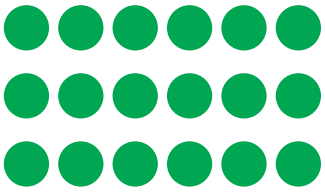
.....

Prepare for Exploring How Multiplication and Division Are Connected

1 Think about what you know about division. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.

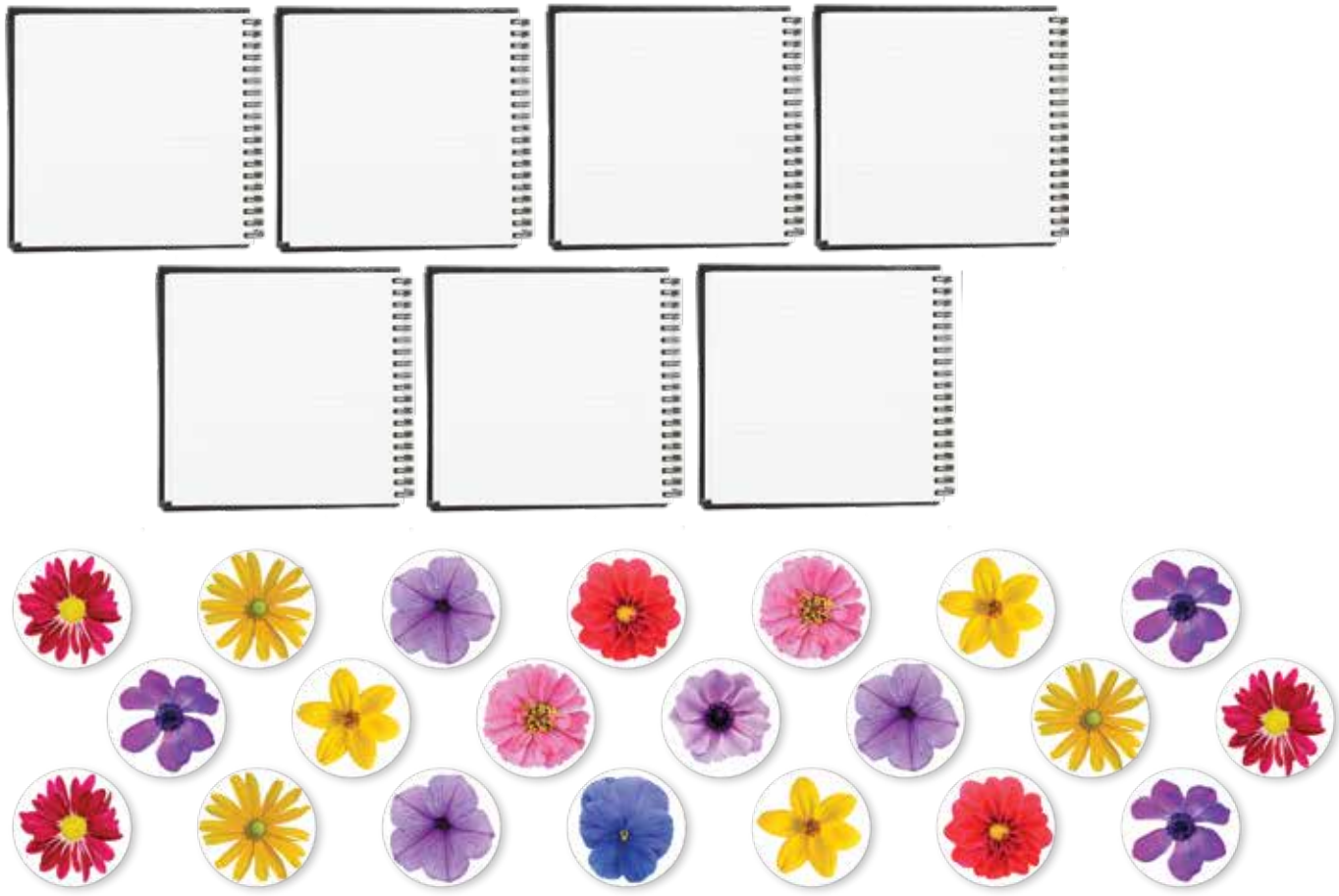


2 Write a multiplication equation and a division equation for the array.



Solve.

3 Yuki has 21 flowers. She puts the same number of flowers on each of 7 pages in her scrapbook to dry them. Draw the flowers Yuki puts on the pages. Write a division equation and a multiplication equation for this problem.



Division equation: Multiplication equation:

4 Explain how you could use a multiplication equation to find 21 ÷ 7.

5 How is multiplication doing the reverse of division?

Develop Understanding of How Multiplication and Division Are Connected

MODEL IT: MULTIPLICATION AND DIVISION SITUATIONS

Read the following problem. Then try problems 1–3.

A pet store has 18 hamsters. The shop owner wants to put 3 hamsters in each cage. How many cages does the shop owner need for all the hamsters?

1 Draw a model using equal groups or an array to show the problem.

2 **a.** Write a division equation for the problem. Use a ? for the unknown number.

b. Write a multiplication equation for the problem. Use a ? for the unknown number.

3 The shop owner needs ..... cages.

DISCUSS IT

- Did you and your partner write the same equations for problem 2? How did you know which equations to write?
- I think word problems that can be solved using division can also be solved using multiplication because . . .

MODEL IT: MULTIPLICATION AND DIVISION FACTS

Find the value of ? to complete each fact.

4 $24 \div 3 = ?$

$3 \times ? = 24$

$? =$ .....

5 $? \times 9 = 54$

$54 \div ? = 9$

$? =$ .....

DISCUSS IT

- How did you find the missing number in each fact?
- I can think of a division fact as a multiplication problem because . . .

CONNECT IT

Complete the problems below.

6 How can you use the three numbers in a division equation to write the related multiplication equations?

7 Use the numbers 7, 8, and 56 to write two multiplication equations and two division equations.

Practice How Multiplication and Division Are Connected

Study how the Example shows one way to relate multiplication and division. Then solve problems 1–12.

EXAMPLE

Marta bakes **15** muffins. She puts an equal number of muffins in **3** baskets.

She thinks, **3** times what number equals **15**?

3 × ? = **15**

3 × **5** = **15**

So, Marta puts **5** muffins in each basket.

1 Draw an array of 15 muffins in 3 rows.

2 How many muffins did you put in each row? _____

3 Fill in the blanks to write a division equation for the array you drew.

_____ ÷ _____ = _____

Use the array to complete the equations.

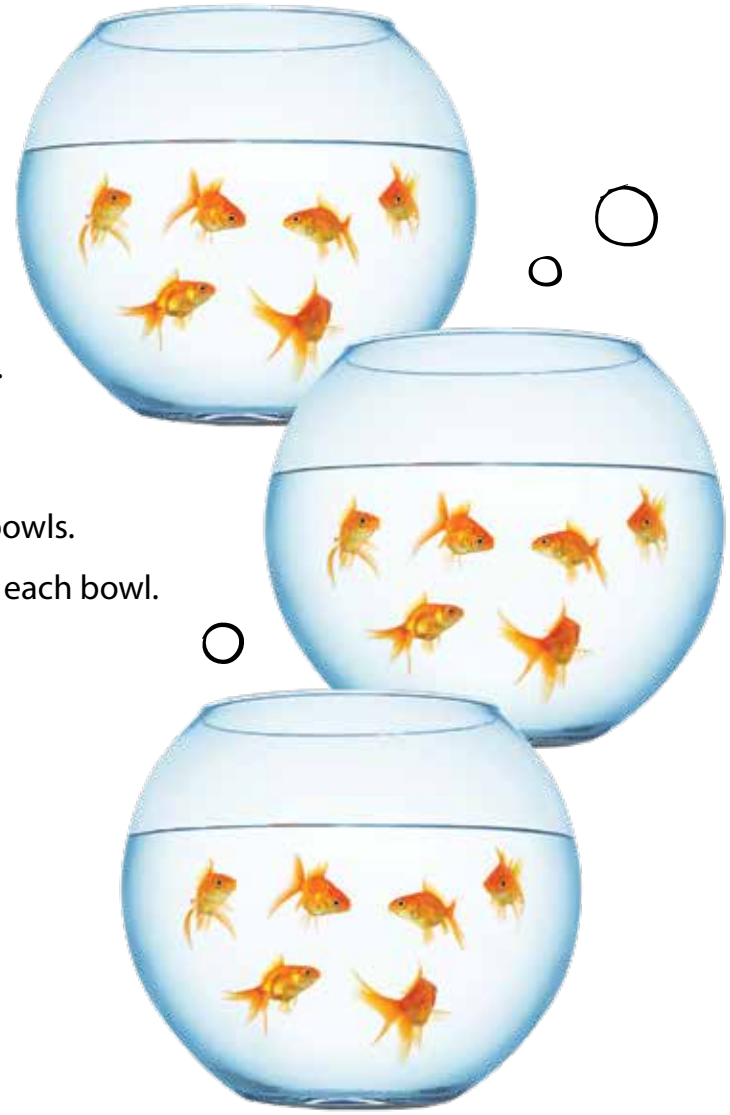
4 2 × _____ = 12 and 12 ÷ 2 = _____

5 6 × _____ = 12 and 12 ÷ 6 = _____

Vocabulary

divide to separate into equal groups and find the number in each group or the number of groups.

array a set of objects arranged in equal rows and equal columns.



Use the numbers 3, 6, and 18 to write the equations for problems 6–8.

6 There are 18 fish. Each bowl holds 6 fish.

Write an equation that shows the number of bowls.

.... = ...

7 There are 18 fish. An equal number of fish are in 3 bowls.

Write an equation that shows the number of fish in each bowl.

.... = ...

8 There are 3 bowls. 6 fish are in each bowl.

Write two different equations that show the total number of fish.

.... = ...

.... = ...

This array shows that 6 × 7 = 42. Use this fact to complete the equations in problems 9–12.

9 6 × 7 = ... 7 × 6 = ...

10 6 × ..... = 42 42 = ... × 6

11 42 ÷ 6 = ... 42 ÷ ..... = 6

12 ..... = 42 ÷ 7 7 = 42 ÷ .....

Refine Ideas About How Multiplication and Division Are Connected

APPLY IT

Complete these problems on your own.

1 IDENTIFY

Ed plants the same number of flowers in each pot at the right. Write two multiplication equations and two division equations that this picture shows.

2 EXPLAIN

Yasmin sees $63 \div ? = 7$ and thinks, "There are 63 things in all that are divided into groups. There are 7 in each group." Explain how Yasmin can use multiplication to help her find the number of groups.

3 ANALYZE

Marissa has 4 boxes of markers with 6 markers in each box. She wrote the following equations:

$4 \times 6 = 24$ $6 \times 4 = 24$ $24 \div 4 = 6$ $24 \div 6 = 4$

Circle the number in each equation that shows the total number of markers. Put a box around the number in each equation that shows the number of groups. Underline the number in each equation that shows the number in each group.

PAIR/SHARE

Discuss your solutions for these three problems with a partner.

Use what you have learned to complete problem 4.

4 Look at the division equation $15 \div 5 = ?$.

Part A Write a multiplication equation you can use to solve this division problem. Use a ? for the unknown number.

Part B Draw a model that could help you solve the division problem. Then solve the problem.

$15 \div 5 =$ .....

5 MATH JOURNAL

Write a story problem that can be modeled by the equation $35 \div 7 = ?$. Explain how you can use multiplication to solve this problem. Then solve the problem.

Explore Multiplication and Division Facts

You learned that multiplication and division are related. In this lesson you will see how multiplication can help you with division facts. Use what you know to try to solve the problem below.

Kenny has 24 marbles. He puts the same number of marbles into each of 3 bags. How many marbles are in each bag?

Learning Targets

- Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.

SMP 1, 2, 3, 4, 5, 6, 7, 8

TRY IT

Math Toolkit

- connecting cubes
- counters
- buttons
- cups
- multiplication models
- number lines

DISCUSS IT

Ask your partner: How did you get started?

Tell your partner: I knew . . . so I . . .

CONNECT IT

1 LOOK BACK

How many marbles are in each bag? Explain how you can prove you are right.

2 LOOK AHEAD

Fact families for multiplication and division are groups of related equations. All the equations, or facts, use the same numbers.

If you know one fact in a family, you can find all the others.

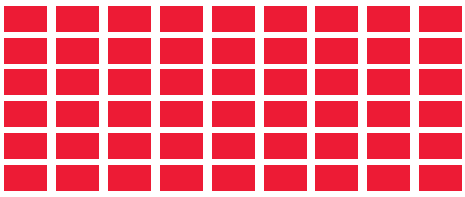
a. Say you need to solve $\square \div 9 = 6$. You can write the facts in this family to find one that you might know. Use the array to help you complete this fact family.

$6 \times 9 =$ .....

$9 \times 6 =$ .....

..... $\div 6 = 9$

..... $\div 9 = 6$



b. Look back at the problem on the previous page. Write the complete fact family using the three numbers for this situation.

....

....

3 REFLECT

How are the multiplication facts in the fact families above alike? How are they different? How are the division facts alike and different?

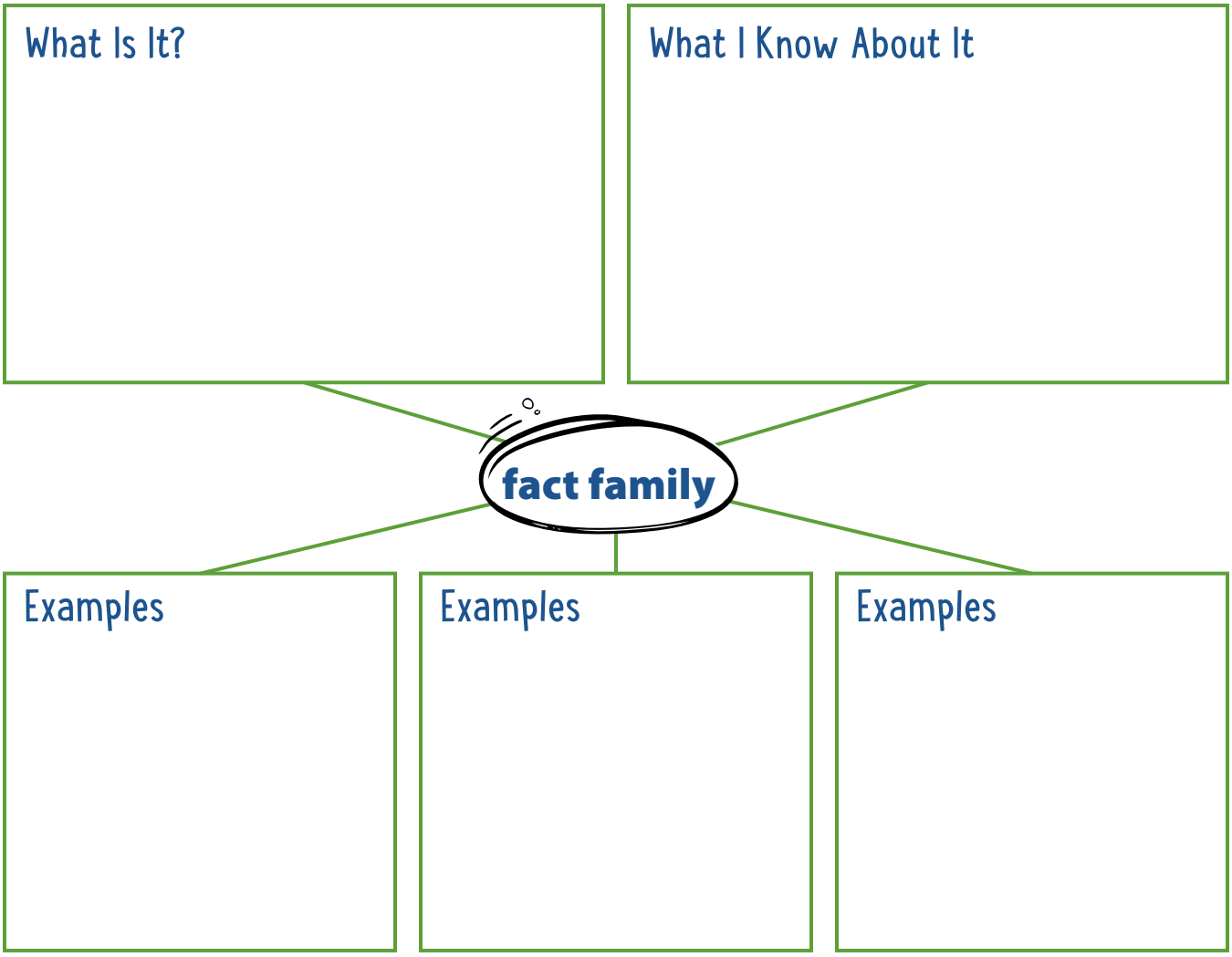
.....

.....

.....

Prepare for Multiplication and Division Facts

1 Think about what you know about multiplication and division. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.



2 How can you use fact families to help find 40 ÷ 8? Explain.

3 Solve the problem. Show your work.

Jada has 28 muffins. She puts the same number of muffins into each of 4 boxes. How many muffins are in each box?

Solution

4 Check your answer. Show your work.

Develop Working with Division Facts

Read and try to solve the problem below.

Jo knows nickels are worth 5 cents, and she needs 40 cents altogether. She wants to find how many nickels she needs. Jo writes:

$$40 \div 5 = \square$$

How many nickels does Jo need?

TRY IT

Math Toolkit

- counters
- buttons
- cups
- 1-centimeter grid paper
- multiplication models
- number lines

DISCUSS IT

Ask your partner: Why did you choose this strategy?

Tell your partner: I started by . . .

Explore different ways to find the unknown number in a division fact.

Jo knows nickels are worth 5 cents, and she needs 40 cents altogether. She wants to find how many nickels she needs. Jo writes:

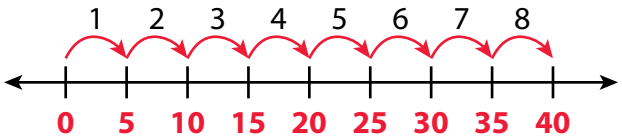
$40 \div 5 = \square$

How many nickels does Jo need?

MODEL IT

You can use a number line to help you understand the problem.

Skip-count by **fives** to find the answer. Start at 0 and jump by fives until you get to 40.



MODEL IT

You can use fact families and multiplication facts you know.

Here are the facts in this family:

$5 \times \square = 40$ $\square \times 5 = 40$ $40 \div \square = 5$ $40 \div 5 = \square$

Write the multiplication facts for 5:

$1 \times 5 = 5$	$2 \times 5 = 10$	$3 \times 5 = 15$	$4 \times 5 = 20$	$5 \times 5 = 25$
$6 \times 5 = 30$	$7 \times 5 = 35$	$8 \times 5 = 40$	$9 \times 5 = 45$	$10 \times 5 = 50$

Look for the fact that has the numbers you know from the fact family, 5 and 40. Use that fact to fill in the unknown numbers above.

CONNECT IT

Now you will use the problem from the previous page to help you understand how to use fact families to find an unknown number in a division fact.

1. Mo wants to know how many nickels he needs to make 45 cents. He writes $45 \div \square = 5$. What other division fact can he write to model this problem?

2. Write the two multiplication facts that are in the same fact family. Use $\square$ for the unknown number.

3. Look at the list of multiplication facts for 5 on the previous page. Which fact will help Mo answer his division problem? How many nickels does Mo need?

4. Explain how you know which multiplication fact you can use to help you find the unknown number in a division fact.

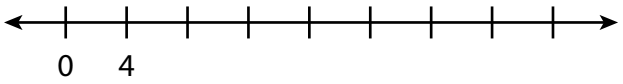
5 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for finding unknown numbers in multiplication and division facts? Explain.

APPLY IT

Use what you just learned to solve these problems.

6 Use the number line to solve 24 ÷ 4 = □.
Show your work.



Solution .....

7 Write the unknown product. Then complete this fact family.

2 × 3 = ...

.....

.....

.....

8 Write two multiplication facts Brice can use to solve □ ÷ 3 = 7.

Practice Working with Division Facts

Study the Example showing how a drawing can help you understand division facts. Then solve problems 1–9.

EXAMPLE

Here is an array of 15 fish.

There are 3 rows with 5 fish in each row.

The fact family describes the array in different ways.

$3 \times 5 = 15$ $15 \div 5 = 3$

$5 \times 3 = 15$ $15 \div 3 = 5$

Write one of the facts from the list above that can help you solve problems 1–3.

1. How many fish are there altogether?

2. 15 fish swim in 3 equal rows. How many fish are in each row?

3. 15 fish swim in rows of 5 fish. How many rows of fish are there?

4. You know that $4 \times 9 = 36$. Write the whole fact family. Use the numbers 4, 9, and 36.

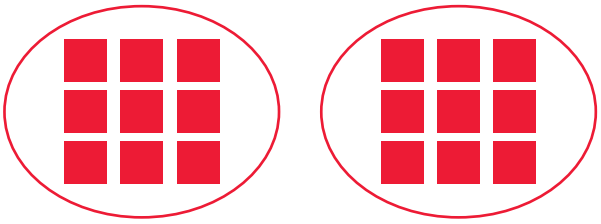
..... × ..... = ...

..... × ..... = ...

..... ÷ ..... = ...

..... ÷ ..... = ...

5 Sienna draws 18 squares in two equal groups of 9. Which division equation does her drawing show?



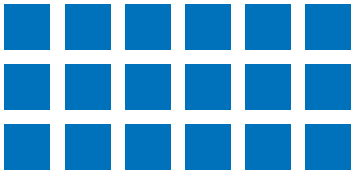
Ⓐ $9 \div 3 = 3$

Ⓑ $18 \div 6 = 3$

Ⓒ $18 \div 2 = 9$

Ⓓ $6 \div 2 = 3$

6 Write two different division equations about the array.

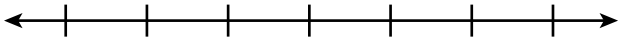


..... ÷ ..... = ...

..... ÷ ..... = ...

Chee has 24 trading cards. He gives away all his cards to friends. He gives 8 cards to each friend.

7 Use the number line to show how you can find how many friends Chee gave cards to.



Solution .....

8 Write two different division facts for the story.

..... and .....

9 Write the multiplication facts that belong to the same fact family.

..... and .....

Develop Using a Multiplication Table

Read and try to solve the problem below.

Complete the facts.

$2 \times \square = 10$ $24 \div 6 = \square$ $\square \times 6 = 48$ $\square \div 1 = 8$

TRY IT

Math Toolkit

- connecting cubes
- counters
- multiplication tables
- 1-centimeter grid paper
- multiplication models
- number lines

DISCUSS IT

Ask your partner: Do you agree with me? Why or why not?

Tell your partner: The strategy I used to find the answer is . . .

Explore different ways to use a multiplication table to complete multiplication and division facts.

Complete the facts.

$2 \times \square = 10$ $24 \div 6 = \square$ $\square \times 6 = 48$ $\square \div 1 = 8$

PICTURE IT

You can use a multiplication table to find the numbers in multiplication and division fact families.

A **multiplication table** shows both multiplication and division fact families.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

MODEL IT

Use the table above to complete the fact family.

The multiplication table shows the three numbers that belong in the fact family for $2 \times \square = 10$. Look at the row for 2. Go across to find 10. Then look up to the top of that column to find the third number in the fact family. Fill in the blanks below.

$2 \times$ _____ $= 10$ $10 \div 2 =$ _____

_____ $\times 2 = 10$ $10 \div$ _____ $= 2$

CONNECT IT

Now you will use the problem from the previous page to help you understand how to use a multiplication table to complete a multiplication or division fact.

1. Look at the multiplication table. What are the three numbers in the fact family for $24 \div 6 = \square$?

   Now fill in the blank: $24 \div 6 =$ _____

2. What are the three numbers in the fact family for $\square \times 6 = 48$?

   Now fill in the blank: _____ $\times 6 = 48$

3. What are the three numbers in the fact family for $\square \div 1 = 8$?

   Fill in the blank: _____ $\div 1 = 8$

4. Explain how you can use a multiplication table to find the three numbers in any fact family.

5 REFLECT

Look back at your **Try It**, strategies by classmates, and **Picture It** and **Model It**. Which models or strategies do you like best for completing multiplication and division facts? Explain.

APPLY IT

Use what you just learned to solve these problems.

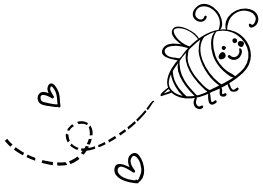
6 Use the multiplication table to write the equations in the fact family that includes 42 and 6. Show your work.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Solution .....

7 Fill in the blank.

56 ÷ ..... = 8



8 Jan and Jon pick 18 apples. They share them equally. Which facts could be used to find the number of apples each person gets?

Ⓐ $6 \times 3 = 18$

Ⓑ $2 \times 9 = 18$

Ⓒ $18 \div 2 = 9$

Ⓓ $18 \div 3 = 6$

Ⓔ $18 \div 9 = 2$

Practice Using a Multiplication Table

Study the Example showing how a multiplication table can help you solve multiplication and division problems. Then solve problems 1–6.

EXAMPLE

You can use the multiplication table to multiply or divide.

Look at the green row of products for 4. Look at the green column of products for 6.

You can see how $4 \times 6 = 24$ is related to $24 \div 4 = 6$ and related to $24 \div 6 = 4$.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

1 Write the fact family for the three numbers 6, 4, and 24.

_____ × _____ = _____ _____ ÷ _____ = _____

_____ × _____ = _____ _____ ÷ _____ = _____

2 Use the table or your fact family in problem 1 to fill in the unknown numbers.

$4 \times$ _____ $= 24$ $24 \div 6 =$ _____

_____ $\times 4 = 24$ _____ $\div 4 = 6$

3 Find 21 on the table above. Use the table to fill in the unknown numbers in this fact family.

$7 \times$ _____ $= 21$ $21 \div 3 =$ _____

_____ $\times 7 = 21$ $21 \div$ _____ $= 3$

Use the multiplication table to solve problems 4–6.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

4 What are the three numbers in the fact family for $28 \div 4 = \square$? _____

Write the fact family.

_____ × _____ = _____ _____ ÷ _____ = _____

_____ × _____ = _____ _____ ÷ _____ = _____

5 What are the three numbers in the fact family for $6 \times \square = 42$? _____

Write the fact family.

_____ × _____ = _____ _____ ÷ _____ = _____

_____ × _____ = _____ _____ ÷ _____ = _____

6 What are the three numbers in the fact family for $\square \div 6 = 8$? _____

Write the fact family.

_____ × _____ = _____ _____ ÷ _____ = _____

_____ × _____ = _____ _____ ÷ _____ = _____

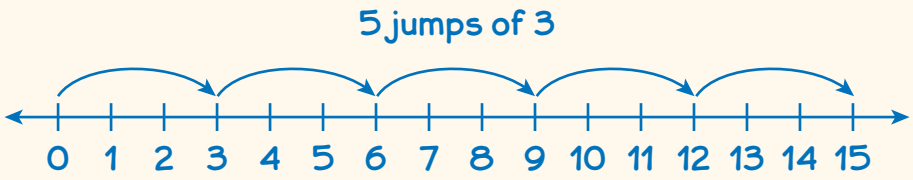
Refine Working with Multiplication and Division Facts

Complete the Example below. Then solve problems 1–9.

EXAMPLE

Today some students will give an oral report. The teacher is planning to have all the reports done in 15 minutes. Each student will get 3 minutes. How many students will give reports? Solve 3 × ☐ = 15.

Look at how you could show your work using a number line.



Solution

Each jump on the number line shows the amount of time a student gets.

PAIR/SHARE
What other equations can be used to solve this problem?

APPLY IT

1 Solve 35 ÷ ☐ = 5. Show your work.

How can you find the third number in this fact family?

Solution

PAIR/SHARE
What are the other facts that belong to this fact family?

2 Solve $4 \times 9 = \square$. Show your work.

Are you looking for a factor or a product?

PAIR/SHARE

Explain how you solved this problem.

Solution

3 Mrs. Tobin needs 30 juice boxes for her class. The juice boxes come in packages of 6. How many packages does she need? Solve $30 \div 6 = \square$.

Ⓐ 4

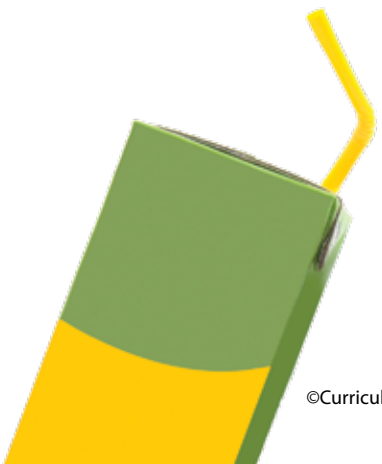
Ⓑ 5

Ⓒ 6

Ⓓ 36

Pia chose Ⓓ as the correct answer. How did she get that answer?

Do you know a multiplication fact that can help you solve this problem?



PAIR/SHARE

Does Pia's answer make sense?

4 Which equation does NOT belong to the same fact family as $12 \div \square = 4$?

Ⓐ $\square \times 4 = 12$

Ⓑ $\square \times 2 = 12$

Ⓒ $4 \times \square = 12$

Ⓓ $12 \div 4 = \square$

5 Which fact can you use to solve $\square \div 5 = 4$?

Ⓐ $5 \times 5 = 25$

Ⓑ $4 \times 5 = 20$

Ⓒ $5 + 4 = 9$

Ⓓ $6 \times 4 = 24$

6 Does putting the number 8 in the box make each equation true?

	Yes	No
$9 \times \square = 64$	Ⓐ	Ⓑ
$6 \times \square = 48$	Ⓒ	Ⓓ
$56 \div \square = 8$	Ⓔ	Ⓕ
$32 \div \square = 4$	Ⓖ	Ⓗ

7 Some fact families have only one multiplication equation and one division equation. Fill in the blanks to show an example.

_____ × _____ = _____

_____ ÷ _____ = _____

8 Sasha has 32 stickers to use in her scrapbook. The scrapbook has 8 pages, and she wants to put the same number of stickers on each page. Write two multiplication facts Sasha can use to find how many stickers to put on each page. How many stickers can Sasha put on each page?

Solution _____

9 MATH JOURNAL

Draw a picture to show a fact family. Then write the fact family.

SELF CHECK Go back to the Unit 2 Opener and see what you can check off.