

Name _____

Relate Multiplication to Division

Essential Question How is multiplication used to solve a division problem?

You can use the relationship between multiplication and division to solve a division problem. Using the same numbers, multiplication and division are opposite, or **inverse operations**.

$$\begin{array}{ccccccc}
 3 & \times & 8 & = & 24 & & 24 & \div & 3 & = & 8 \\
 \uparrow & & \uparrow & & \uparrow & & \uparrow & & \uparrow & & \uparrow \\
 \text{factor} & & \text{factor} & & \text{product} & & \text{dividend} & & \text{divisor} & & \text{quotient}
 \end{array}$$



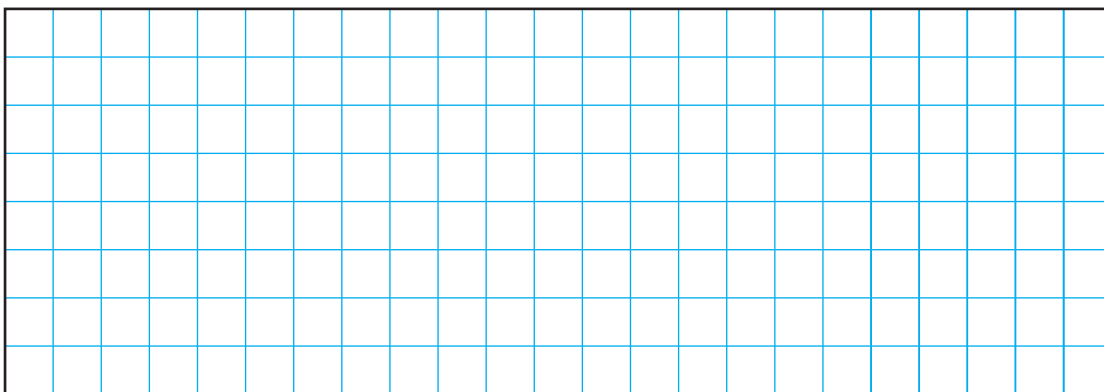
UNLOCK the Problem REAL WORLD

Joel and 5 friends collected 126 marbles. They shared the marbles equally. How many marbles will each person get?

- Underline the dividend.
- What is the divisor? _____

One Way Make an array.

- Outline a rectangular array on the grid to model 126 squares arranged in 6 rows of the same length. Shade each row a different color.



- How many squares are shaded in each row? _____
- Use the array to complete the multiplication sentence. Then, use the multiplication sentence to complete the division sentence.

$$6 \times \underline{\quad} = 126 \qquad 126 \div 6 = \underline{\quad}$$

So, each of the 6 friends will get _____ marbles.



Another Way Use the Distributive Property.

Divide. $52 \div 4$

You can use the Distributive Property and an area model to solve division problems. Remember that the Distributive Property states that multiplying a sum by a number is the same as multiplying each addend in the sum by the number and then adding the products.

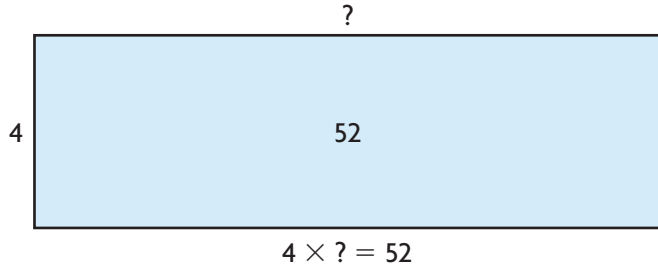
STEP 1

Write a related multiplication sentence for the division problem.

Think: Use the divisor as a factor and the dividend as the product. The quotient will be the unknown factor.

$$52 \div 4 = \square$$

$$4 \times \square = 52$$

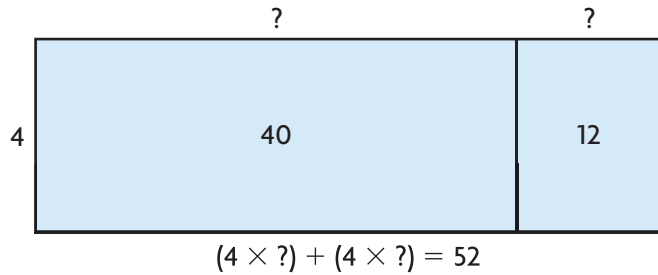


STEP 2

Use the Distributive Property to break apart the large area into smaller areas for partial products that you know.

$$(40 + 12) = 52$$

$$(4 \times \underline{\quad}) + (4 \times \underline{\quad}) = 52$$



STEP 3

Find the sum of the unknown factors of the smaller areas.

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

STEP 4

Write the multiplication sentence with the unknown factor that you found. Then, use the multiplication sentence to find the quotient.

$$4 \times \underline{\quad} = 52$$

$$52 \div 4 = \underline{\quad}$$

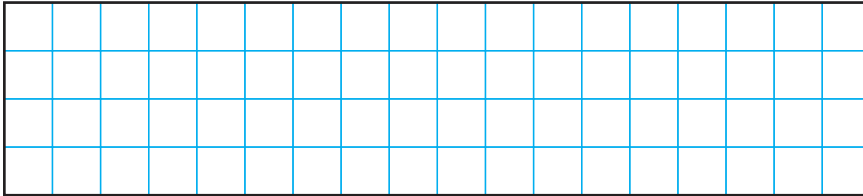
- **Explain** how you can use the Distributive Property to find the quotient of $96 \div 8$.

Name _____

Share and Show


1. Brad has 72 toy cars that he puts into 4 equal groups. How many cars does Brad have in each group? Use the array to show your answer.


$4 \times \underline{\quad} = 72$ $72 \div 4 = \underline{\quad}$



Use multiplication and the Distributive Property to find the quotient.

2. $108 \div 6 = \underline{\quad}$

 3. $84 \div 6 = \underline{\quad}$

 4. $184 \div 8 = \underline{\quad}$

Math Talk

MATHEMATICAL PRACTICES

Explain how using multiplication as the inverse operation helps you solve a division problem.

On Your Own.....

Use multiplication and the Distributive Property to find the quotient.

5. $60 \div 4 = \underline{\quad}$

6. $144 \div 6 = \underline{\quad}$

7. $252 \div 9 = \underline{\quad}$



Find each quotient. Then compare. Write $<$, $>$, or $=$.

8. $51 \div 3$ ○ $68 \div 4$

9. $252 \div 6$ ○ $135 \div 3$

10. $110 \div 5$ ○ $133 \div 7$

Problem Solving

Use the table to solve 11–13.

11. A group of 6 friends share a bag of the 45-millimeter bouncy balls equally among them. How many does each friend get?

12. **H.O.T.** Mr. Henderson has 2 bouncy-ball vending machines. He buys one bag of the 27-millimeter balls and one bag of the 40-millimeter balls. He puts an equal number of each in the 2 machines. How many bouncy balls does he put in each machine?

13. Lindsey buys a bag of each size of bouncy ball. She wants to put the same number of each size of bouncy ball into 5 party-favor bags. How many of each size of bouncy ball will she put in a bag?

14. **What's the Error?** Sandy writes $(4 \times 30) + (4 \times 2)$ and says the quotient for $128 \div 4$ is 8. Is she correct? **Explain.**

15. **Test Prep** Which of the following can be used to find $150 \div 6$?

- (A) $(6 \times 20) + (6 \times 5)$
- (B) $(6 \times 10) + (6 \times 5)$
- (C) $(2 \times 75) + (2 \times 3)$
- (D) $(6 \times 15) + (6 \times 5)$



SHOW YOUR WORK