CHAPTER 2
Lesson 5

Name _____

Model Multiplication and Division Equations

Florida's B.E.S.T.
- **Algebraic Reasoning** 5.AR.1.1, 5.AR.2.4
- **Number Sense & Operations** 5.NSO.2.1, 5.NSO.2.2
- **Mathematical Thinking & Reasoning** MTR.2.1, MTR.3.1, MTR.5.1

I Can model and solve multiplication and division equations.

UNLOCK the Problem Real World

Rashid is buying a movie ticket and a box of popcorn for $12. The ticket costs 2 times as much as the popcorn. How much does the popcorn cost? How much does the ticket cost?

The cost of the ticket is $2 \times p$, where p is the price of the popcorn.

- How does knowing that a ticket costs 2 times as much as the popcorn help you choose an operation to write an expression?

_____

_____

Use a related equation.

STEP 1

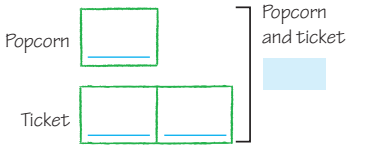
Complete the bar model to represent the popcorn and ticket cost.

The popcorn costs p. Label the box for the popcorn. It represents 1 unit.

The cost of the ticket is _____ times as much. Label the boxes for the ticket.

What is the total cost? _____

How many units are shown in the model? _____



STEP 2

Use the bar model to write a multiplication equation.

Cost of popcorn and ticket: $3 \times p$ = Total cost: _____

To find a missing factor, write a division equation that is related to the multiplication equation. Then divide.

_____ $\div 3 = p$ _____ $= p$

So, 1 bag of popcorn costs _____.

The cost of 1 ticket is 2 times the cost of 1 bag of popcorn.

So, 1 ticket costs _____.

Math Idea

You can write $3 \times p$ as $3 \times p$, $3p$, $3(p)$, or $3 \bullet p$.

Math Talk

MTR 3.1 Complete tasks with mathematical fluency.

What is the total cost of 3 boxes of popcorn and 6 tickets?

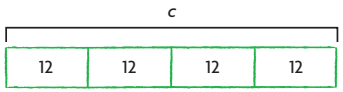
Examples Use a related equation.

Katrina buys a package of trading cards. She divides the cards into 4 equal piles. Each pile contains 12 cards. The equation that describes the number of cards in the package is $c \div 4 = 12$. How many cards were in the package when Katrina bought it?

Write a related equation.

MODEL

- Use a bar model to represent the problem.



SOLVE

- Write a related multiplication equation.

Multiplication equation: _____

c = _____

So, the package Katrina bought had _____ trading cards in it.

Math Talk

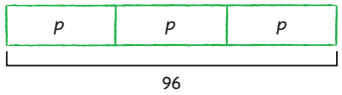
MTR 2.1 Demonstrate understanding in multiple ways.

Explain how the bar models for multiplication and division are related.

Share and Show Math Board

Use the bar models to write an equation. Then solve.

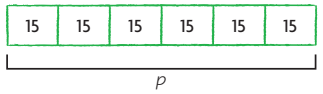
1. The cost of 3 pencils is 96 cents. Each pencil costs the same. What is the cost of 1 pencil, p?



Equation: _____ = 96 p = _____

One pencil costs _____ cents.

2. Chef makes 6 batches of chili. Each batch contains 15 pints of tomato sauce. How many pints does she use in all?



Equation: _____ p = _____

If one pint equals 2 cups, chef uses _____ cups of sauce.

On Your Own

Use a bar model or a related equation to solve. Check your solution.

3. $128 = 8 \times d$

4. $r \div 9 = 17$

5. $6m = 78$

6. $7 = b \div 17$

7. WRITE Math How can you justify that $j = 348$ is the solution to $j \div 12 = 29$? Explain.

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