Fraction Division Problem Solving

Lesson 2-5

Name: _____ Date: _____ Class: _____

Key Vocabulary Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

A bar model showing 3/4 split into 1/8-size pieces, or the equation 3/4 ÷ 1/8 = 6

Model

A picture or math way to show a problem so you can solve it.

3/4 ÷ 1/8 = 6 — the left side (division) equals the right side (answer)

Equation

A math sentence with an equal sign showing both sides are the same.

In 3/4 ÷ 1/8 = 6, the solution is 6 portions

Solution

The answer to an equation or problem.

3 ÷ 1/4 = 12. Is 12 reasonable? Yes, because 1/4 is small so many pieces fit into 3.

Reasonableness

Checking if your answer makes sense.

If 3/4 ÷ 1/8 = 6, then 6 × 1/8 = 6/8 = 3/4. Multiplication checks division.

Inverse operations

Two math actions that undo each other, like × and ÷.

Key Ideas & Notes

- Agent Torres is closing the biggest case of the year.
- She has 2/3 of a gallon of fingerprint dust left and each test uses 1/6 of a gallon.
- Before the evidence expires, she needs to figure out exactly how many tests she can run.
- Can you write the equation and solve it?
- Read each word problem. Set up the fraction division equation, solve it, and check for reasonableness.

Think About It

- What is the total amount of fingerprint dust?
- How much does each test use?
- What operation will help solve this problem?

My Notes

Guided Examples

Example 1

A ribbon is 4/5 of a yard long. Each bow uses 1/10 of a yard. Which equation finds how many bows can be made?

Solution: The total (4/5 yard) is divided into groups of 1/10 yard each. The equation is $4/5 \div 1/10 = 4/5 \times 10/1 = 40/5 = 8$ bows.

Answer: A. $4/5 \div 1/10$

Example 2

A detective has 1/2 gallon of solution. Each test uses 1/8 gallon. How many tests can be run?

Solution: $1/2 \div 1/8 = 1/2 \times 8/1 = 8/2 = 4$ tests.

Answer: A. 4

Example 3

A trail is 3/4 mile long. A jogger runs laps of 1/4 mile each. How many laps does the jogger complete?

Solution: $3/4 \div 1/4 = 3/4 \times 4/1 = 12/4 = 3$ laps. This is reasonable: three 1/4-mile pieces fit into 3/4 mile.

Answer: A. 3 laps

Write About the Math

The Writing Revolution

I can explain my reasoning using the words model, equation, solution, and reasonableness.

1. Kernel Sentence

subject + verb

Model: Equation is a math sentence with an equal sign showing both sides are the same.
Ecuación es una oración matemática con un signo igual que muestra que ambos lados son iguales.

Write a kernel sentence about equation. Use a subject and a verb.
Escribe una oración base sobre ecuación. Usa un sujeto y un verbo.

2. Sentence Expansion

because · but · so

Kernel: Equation matters in math
Ecuación importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because *porque*

Equation matters in math because ____.
Ecuación importa en matemáticas porque ____.

but *pero*

Equation matters in math, but ____.
Ecuación importa en matemáticas, pero ____.

so *entonces*

Equation matters in math, so ____.
Ecuación importa en matemáticas, entonces ____.

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about equation.
Di un hecho verdadero sobre equation.

Equation ____.

Question
Pregunta

Ask a question about equation.
Haz una pregunta sobre equation.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about equation.
Muestra entusiasmo sobre equation.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with equation.
Dile a un compañero qué hacer con equation.

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

The problem asked me to ____.
El problema me pidió ____.

I divided because ____.
Dividí porque ____.

This is like when ____.
Esto es como cuando ____.

Try It

Solve on your own. Check the answer key when you are done.

1. A board is 5/6 foot long. Each shelf bracket needs 1/6 foot. How many brackets fit?

A. 5

B. 1/36

C. 6

D. 5/36

Show your work:

2. Marcus solved 2/3 ÷ 1/4 and got 8/3 = 2 2/3. He says 'That can't be right because I started with less than 1.' Is Marcus's math correct? Is his reasoning correct?

A. His math is correct (2 2/3), but his reasoning is wrong — dividing by a small fraction gives a larger result

B. His math and reasoning are both correct — the answer should be less than 1

C. His math is wrong — the answer should be 1/6

D. His math is wrong — the answer should be 8/12

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

Write your own fraction division word problem where the answer is 8. Then show the equation, solve it step by step, and explain how you know your answer is reasonable.

Sentence starter: My word problem: ____. The equation is ____ ÷ ____ = ____. I solved it using KCF: ____ × ____ = ____. The answer 8 is reasonable because ____.

Show your work:

Reflect — Exit Ticket

A pipe is 3/4 meter long. Each connector piece is 3/8 meter. How many connectors fit on the pipe?

A. 2

B. 9/32

C. 3/2

D. 6

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. 5 — *5/6 ÷ 1/6 = 5/6 × 6/1 = 30/6 = 5 brackets.*
2. **Try It 2:** A. His math is correct (2 2/3), but his reasoning is wrong — dividing by a small fraction gives a larger result — *2/3 ÷ 1/4 = 2/3 × 4/1 = 8/3 = 2 2/3. This IS correct. When you divide by a number less than 1, the quotient is greater than the dividend.*
3. **Exit Ticket:** A. 2 — *3/4 ÷ 3/8 = 3/4 × 8/3 = 24/12 = 2. Two connector pieces fit on the pipe.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Equation is a math sentence with an equal sign showing both sides are the same.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).