Objective Fractions by Fractions Division

Warm-Up

Use benchmark fractions to estimate each product.

1. $2\frac{5}{6} \times 3\frac{1}{8}$

Sample worked out

$$2\frac{5}{6} \quad \times \quad 3\frac{1}{8}$$
$$\downarrow \qquad\qquad \downarrow$$
$$\text{Closest value} \qquad \text{Closest value}$$
$$\downarrow \qquad\qquad \downarrow$$
$$3 \quad \times \quad 3 \quad = \quad 9$$

2. $5\frac{7}{9} \times 7\frac{2}{15}$

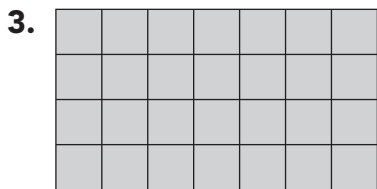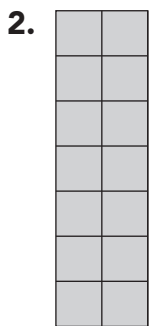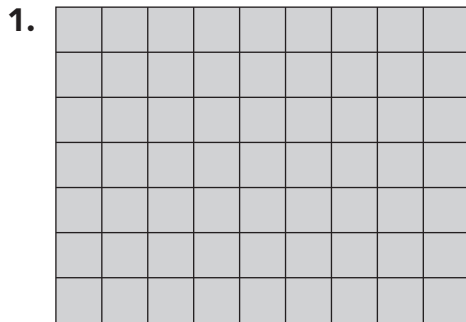**3.** $6\frac{5}{7} \times 1\frac{4}{5}$

4. $4\frac{6}{7} \times 1\frac{2}{9}$

All in the Fact Family

Write the multiplication-division fact family for each rectangular array.

1.

**2.**

3.

4. For each fact family, which numbers represent the side lengths of the area model? Which numbers represent the area?
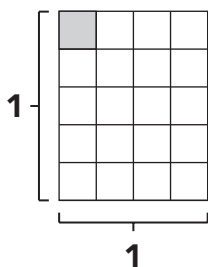
Fractional Fact Families

Collect all the diagrams you sorted in the lesson Thinking Rationally. Just like fact families for whole-number area models, you can also write multiplication-division fact families for models involving fractions.
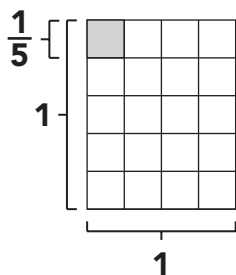
Consider the model shown.
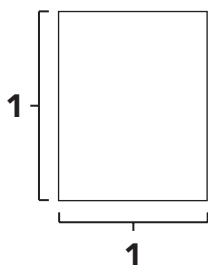
This model is a 1×1, that will be broken down in sections.

Notice that the shaded area represents the fraction $\frac{1}{20}$, because 1 rectangle is shaded of the 20 total unit rectangles.

The **height** of the shaded rectangle is $\frac{1}{5}$ of the height of 1 that the model represents.
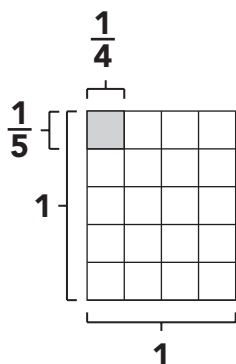
The **width** of the shaded rectangle is $\frac{1}{4}$ of the width of 1 that the model represents. So, the shaded area of the rectangle represents the product

**1. Write a multiplication-division fact family for the model.**

2. Describe how the model shows the division of fractions.

3. Write multiplication-division fact families with fractions for the remaining diagrams that you sorted. Show your work.

You can also use fraction strip models to represent fraction division. For example, this model shows $\frac{3}{4} \div \frac{1}{4}$. The division expression asks, how many $\frac{1}{4}$ s are in $\frac{3}{4}$?

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	

$$\frac{3}{4}$$
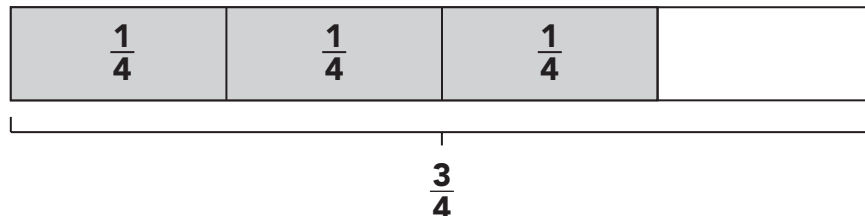
1. What is the quotient: $\frac{3}{4} \div \frac{1}{4}$ = ?

2. Write a sentence to describe the answer.

3. Write a sentence to describe what each division expression is asking. Then, draw a fraction-strip diagram to represent the division problem. Finally, calculate the quotient and write a sentence to describe your answer.

a. $\frac{3}{2} \div \frac{1}{4}$ 　　　　　　　　　**b.** $\frac{1}{2} \div \frac{1}{8}$ 　　　　　　　　　**c.** $\frac{3}{4} \div \frac{1}{8}$

4. How can you check each of your answers in Question 3 to make sure you were correct? Explain your reasoning.

CHALLENGE

5. Mason has $\frac{2}{3}$ of a foot of ribbon. He needs to divide the ribbon into $\frac{1}{6}$-foot pieces. How many pieces can he cut from the ribbon?

Write a division problem to represent this situation. Use the ruler to answer the question and show your work.

LESSON 2.3a
Yours Is to Reason Why!

Objective   Fractions by Fractions Division

Find the reciprocal.

1. $\dfrac{5}{7}$ _____

2. $\dfrac{3}{4}$ _____

3. $\dfrac{3}{5}$ _____

4. $\dfrac{1}{10}$ _____

5. $\dfrac{4}{9}$ _____

6. $\dfrac{13}{14}$ _____

7. $\dfrac{7}{12}$ _____

8. $\dfrac{3}{10}$ _____

9. $\dfrac{5}{8}$ _____

Divide. Write each answer in simplest form.

10. $\dfrac{5}{6} \div \dfrac{1}{2}$ _____

11. $\dfrac{7}{8} \div \dfrac{2}{3}$ _____

12. $\dfrac{9}{10} \div \dfrac{3}{4}$ _____

13. $\dfrac{3}{4} \div 9$ _____

14. $\dfrac{6}{9} \div \dfrac{6}{7}$ _____

15. $\dfrac{5}{6} \div \dfrac{3}{10}$ _____

16. $\dfrac{5}{6} \div \dfrac{3}{4}$ _____

17. $\dfrac{5}{8} \div \dfrac{3}{5}$ _____

18. $\dfrac{21}{32} \div \dfrac{7}{8}$ _____

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