



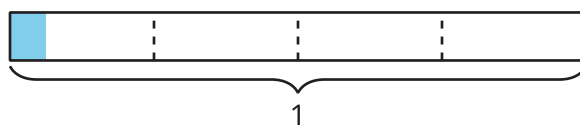
# Represent Division of Unit Fractions by Whole Numbers

Let's use diagrams to represent division of a unit fraction by a whole number.

## Warm-up

### Estimation Exploration: How Much Is Shaded?

How much is shaded?



Record an estimate that is:

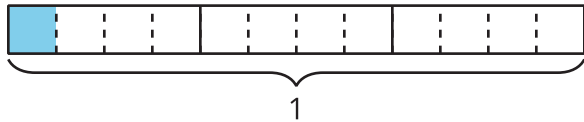
| too low | about right | too high |
|---------|-------------|----------|
|         |             |          |

## Activity 1

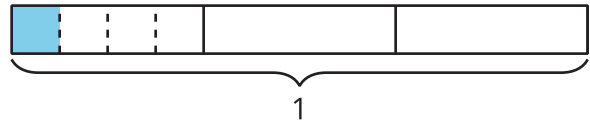
### Diagrams, Equations, Situations

Priya and Mai use these diagrams to find the value of  $\frac{1}{3} \div 4$ .

Priya's diagram



Mai's diagram



1. How are the diagrams alike?

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2. How are they different?

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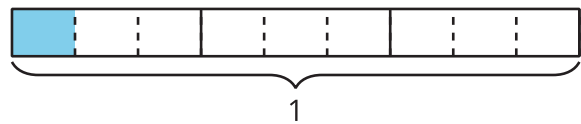


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3. Find the value that makes the equation true.

$$\frac{1}{3} \div 4 = \underline{\hspace{2cm}}$$

4. Han draws this diagram to represent  $\frac{1}{3} \div 3$ . How does his diagram show  $\frac{1}{3} \div 3$ ? Explain or show your reasoning.



5. Find the value that makes the equation true.  
Explain or show your reasoning.

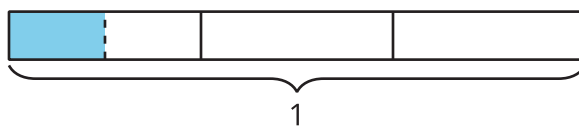
$$\frac{1}{3} \div 3 = \underline{\hspace{2cm}}$$

## Activity 2

### Noah's Work

1. Find the value of  $\frac{1}{3} \div 2$ . Explain or show your reasoning.

2. Noah is trying out Mai's diagram for this problem. Here is his work.



$\frac{1}{3} \div 2 = \frac{1}{2}$ , because I divided  $\frac{1}{3}$  into 2 equal parts and  $\frac{1}{2}$  of  $\frac{1}{3}$  is shaded in.

a. What questions do you have for Noah?

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b. Noah's equation is incorrect. How can Noah revise his explanation?

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## Activity 3

### Look for Patterns

1. Find the value that makes each equation true. Use a diagram if it is helpful.

a.  $\frac{1}{4} \div 2 = \underline{\hspace{2cm}}$

b.  $\frac{1}{4} \div 3 = \underline{\hspace{2cm}}$

c.  $\frac{1}{4} \div 4 = \underline{\hspace{2cm}}$

2. What patterns do you notice?

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3. How would you find the value of  $\frac{1}{4}$  divided by any whole number? Explain or show your reasoning.