



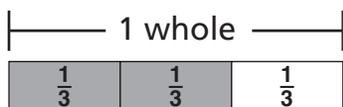
## Family Letter

### Content Overview

Dear Family,

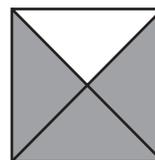
In this unit, your child will be introduced to fractions. Students will build fractions from unit fractions and explore fractions as parts of a whole.

#### Unit Fraction



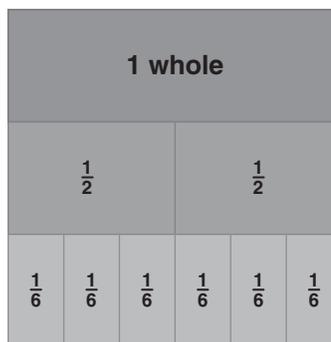
$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

#### Fraction of a Whole



$\frac{3}{4}$  ← numerator  
 $\frac{3}{4}$  ← denominator

Students will find equivalent fractions, and compare fractions with either the same denominator or the same numerator.



$$\frac{1}{2} = \frac{3}{6}$$

$$\frac{1}{2} > \frac{1}{6}$$

$$\frac{2}{4} < \frac{3}{4}$$

In this unit, your child will also solve real world problems using his or her understanding of fraction concepts.

Please call if you have any questions or comments.

Sincerely,  
Your child's teacher



CA CC

Unit 7 addresses the following standards from the *Common Core State Standards for Mathematics with California Additions*: 3.NF.1, 3.NF.2, 3.NF.2a, 3.NF.2b, 3.NF.3, 3.NF.3a, 3.NF.3b, 3.NF.3c, 3.NF.3d, 3.G.2, and for all Mathematical Practices.



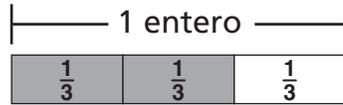
Carta a la familia

**Un vistazo general al contenido**

**Estimada familia:**

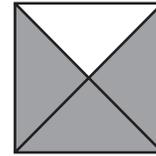
En esta unidad, se le presentarán por primera vez las fracciones a su niño. Los estudiantes formarán fracciones con fracciones unitarias y explorarán las fracciones como partes de un entero.

**Fracción unitaria**



$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

**Fracción de un entero**



3 ← numerador  
4 ← denominador

Los estudiantes hallarán fracciones equivalentes y compararán fracciones del mismo denominador o del mismo numerador.



$$\frac{1}{2} = \frac{3}{6}$$

$$\frac{1}{2} > \frac{1}{6}$$

$$\frac{2}{4} < \frac{3}{4}$$

En esta unidad, su niño también resolverá problemas cotidianos usando los conceptos que aprenda sobre fracciones.

Si tiene alguna duda o algún comentario, por favor comuníquese conmigo.

*Atentamente,  
El maestro de su niño*



**CA CC**

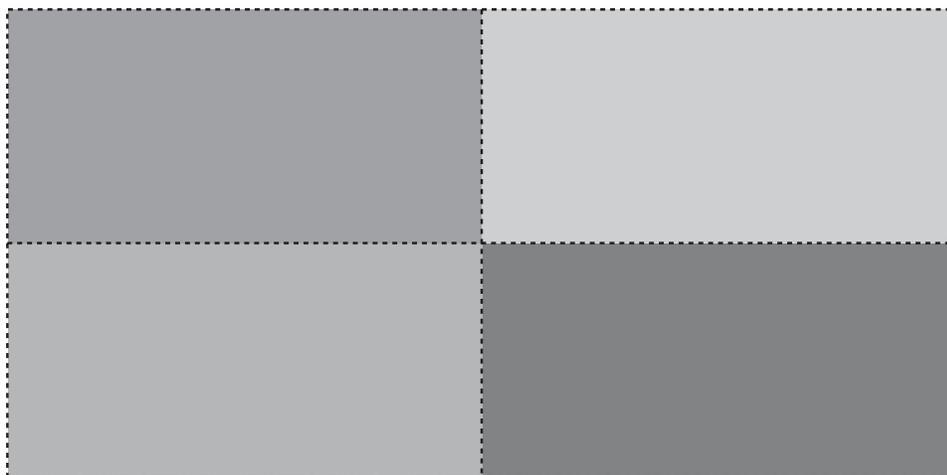
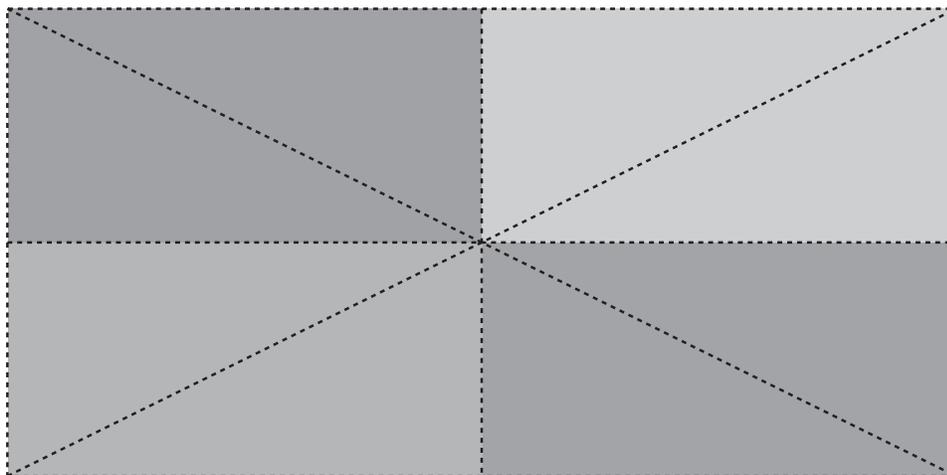
En la Unidad 7 se aplican los siguientes estándares auxiliares, contenidos en los *Estándares estatales comunes de matemáticas con adiciones para California*: 3.NF.1, 3.NF.2, 3.NF.2a, 3.NF.2b, 3.NF.3, 3.NF.3a, 3.NF.3b, 3.NF.3c, 3.NF.3d, 3.G.2 y todos los de prácticas matemáticas.

## ► Fraction Rectangles

Cut out the bottom rectangle first.

Then cut on the dotted lines to make 4 rectangles.

Wait to cut out the top rectangle.





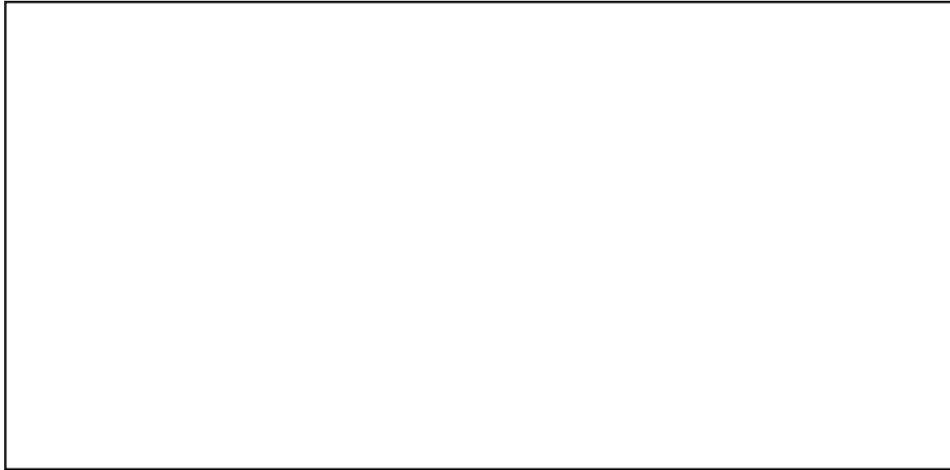
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## ► Explore Unit Fractions

Use your rectangles from page 369A to make the whole shape. Count the equal parts. What unit fraction of the whole shape is one of the rectangles?

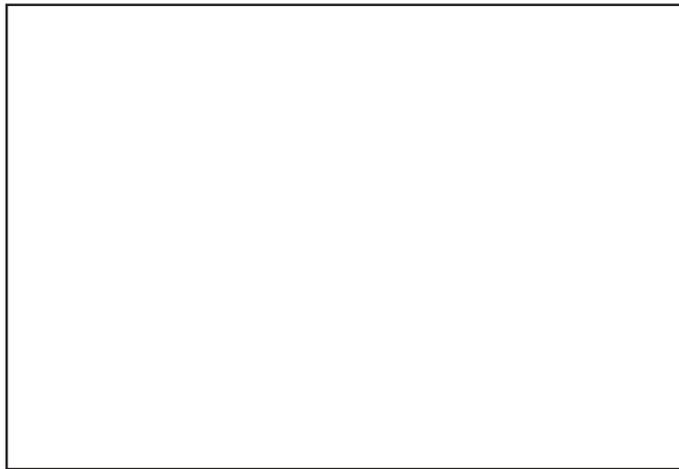
1.



Number of equal parts \_\_\_\_\_

Unit fraction \_\_\_\_\_

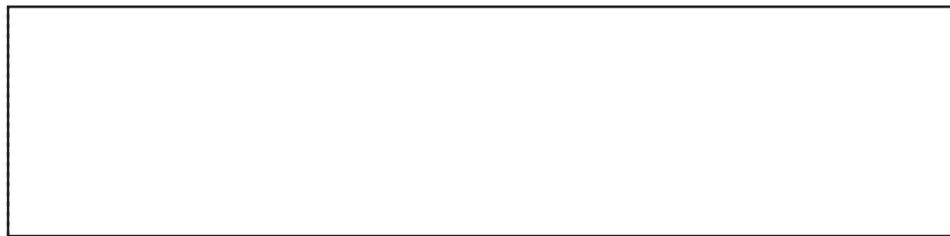
2.



Number of equal parts \_\_\_\_\_

Unit fraction \_\_\_\_\_

3.



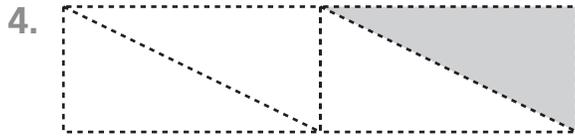
Number of equal parts \_\_\_\_\_

Unit fraction \_\_\_\_\_



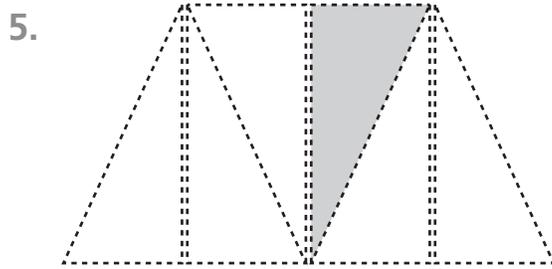
## ► Explore Unit Fractions (continued)

Use your triangles from page 369A to make a whole shape like the model shown. Count the equal parts in the whole. What unit fraction of the whole shape is the shaded triangle?



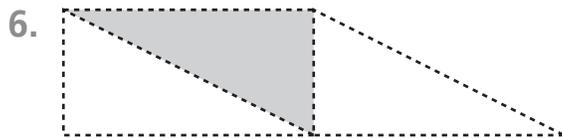
There are \_\_\_\_\_ equal parts in the whole shape.

The shaded triangle is \_\_\_\_\_ of the whole shape.



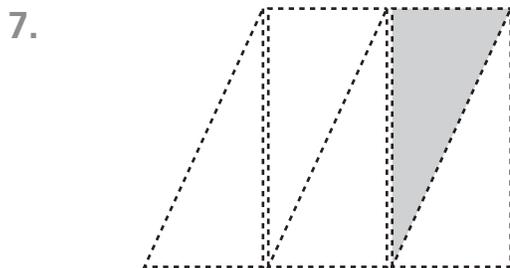
There are \_\_\_\_\_ equal parts in the whole shape.

The shaded triangle is \_\_\_\_\_ of the whole shape.



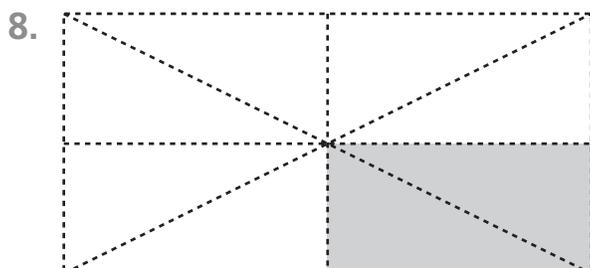
There are \_\_\_\_\_ equal parts in the whole shape.

The shaded triangle is \_\_\_\_\_ of the whole shape.



There are \_\_\_\_\_ equal parts in the whole shape.

The shaded triangle is \_\_\_\_\_ of the whole shape.



There are \_\_\_\_\_ equal parts in the whole shape.

One shaded triangle is \_\_\_\_\_ of the whole shape.

## VOCABULARY

fraction

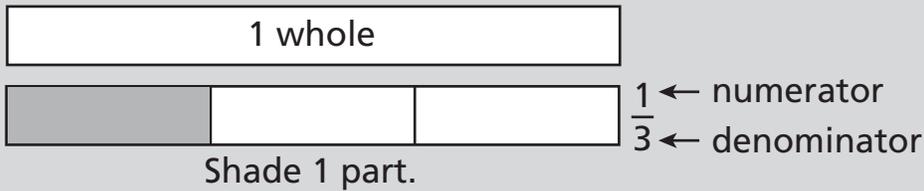
denominator

numerator

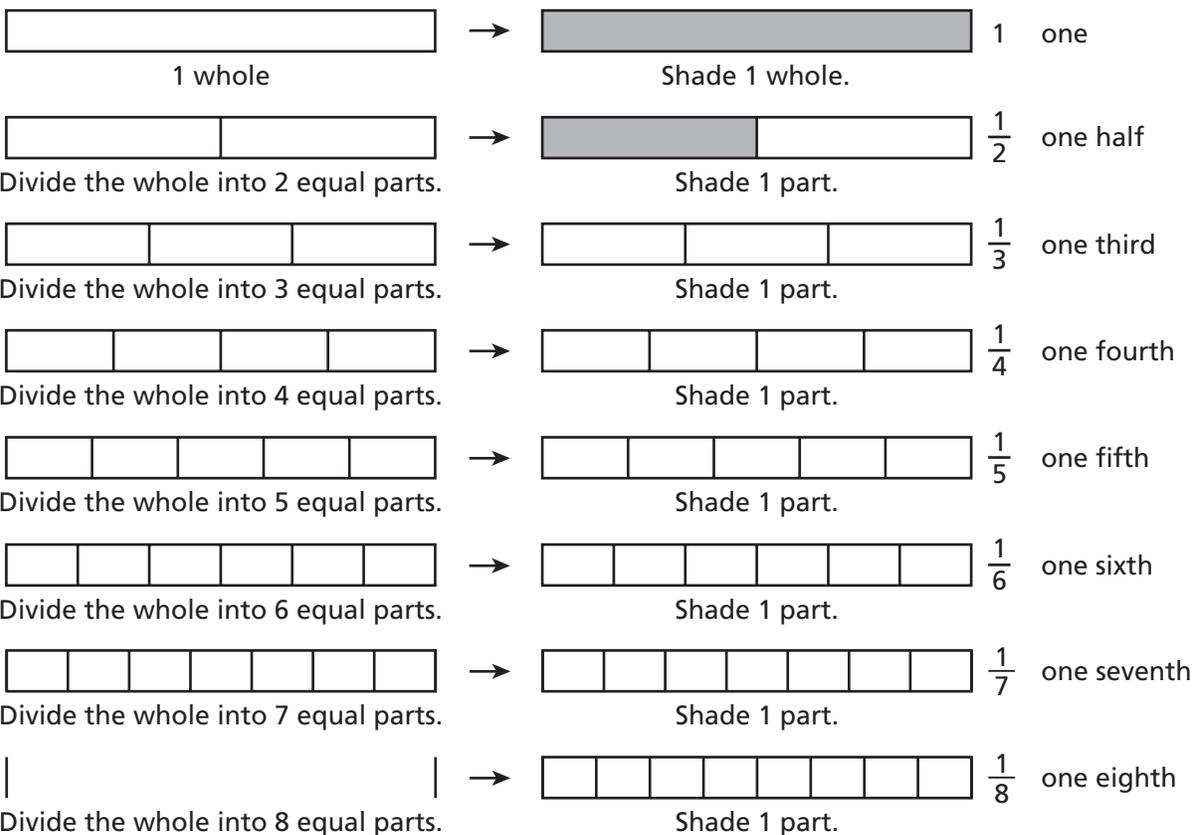
unit fraction

## ► Unit Fractions and Fraction Bars

You can represent a **fraction** with a fraction bar. The **denominator** tells how many equal parts the whole is divided into. The **numerator** tells how many equal parts you are talking about.



A **unit fraction** has a numerator of 1. Shade the rest of the fraction bars at the right below to represent unit fractions. What patterns do you see?





## ► Build Fractions from Unit Fractions

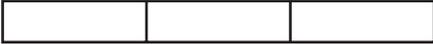
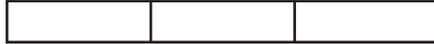
Write the unit fractions for each whole. Next, shade the correct number of parts. Then show each shaded fraction as a sum of unit fractions.

9.  →  Shade 2 parts.  
Divide the whole into 5 equal parts.

$$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$$

$$\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$$


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10.  →  Shade 2 parts.  
Divide the whole into 3 equal parts.

---

11.  →  Shade 5 parts.  
Divide the whole into 7 equal parts.

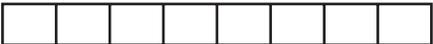
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12. → Shade 7 parts.  
Divide the whole into 8 equal parts.

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13. → Shade 3 parts.  
Divide the whole into 6 equal parts.

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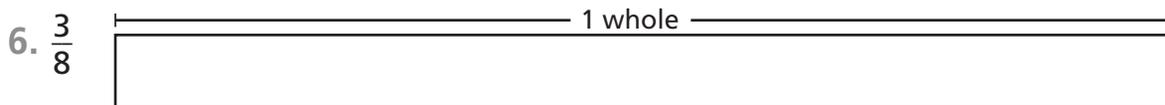
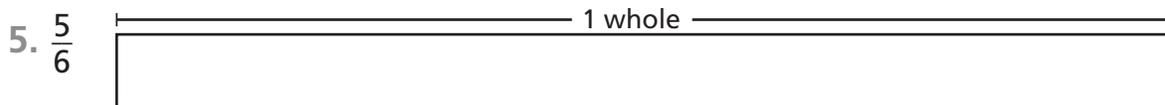
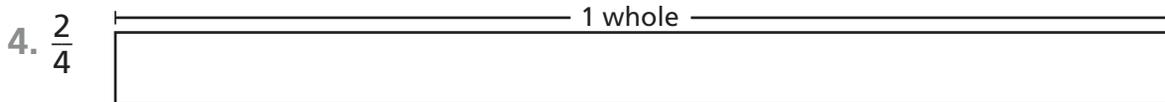
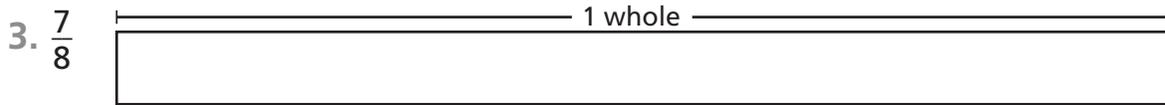
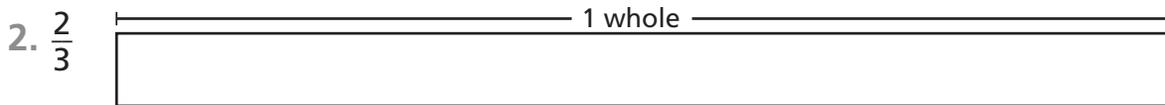
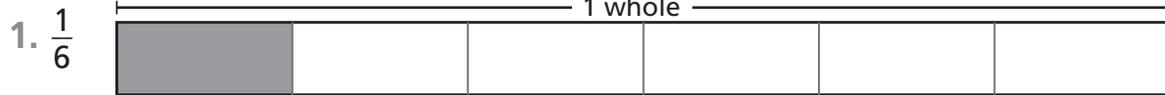
14.  → Shade 8 parts.  
Divide the whole into 8 equal parts.

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## ► Use Fraction Bars

Shade each fraction bar to show the fraction.

First, divide the fraction bar into the correct unit fractions.



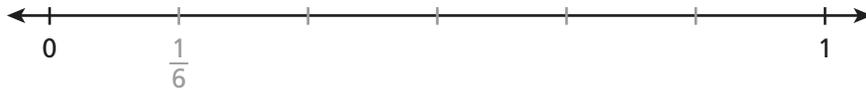


### ► Use Number Lines

Mark each number line to show the fraction.

First, divide the number line into the correct unit fractions.

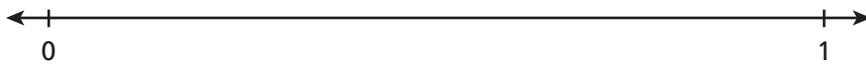
7.  $\frac{1}{6}$



8.  $\frac{2}{3}$



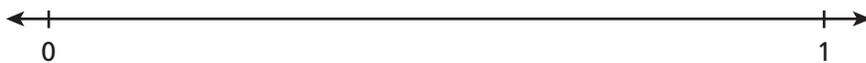
9.  $\frac{7}{8}$



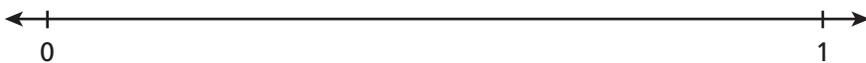
10.  $\frac{2}{4}$



11.  $\frac{5}{6}$



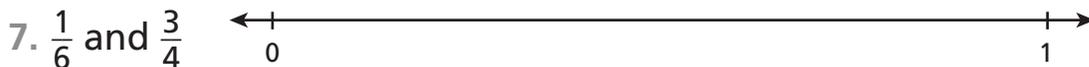
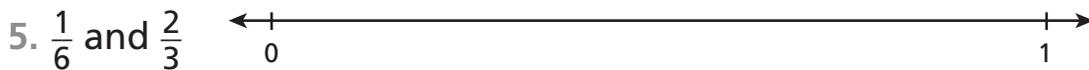
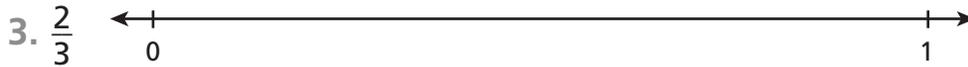
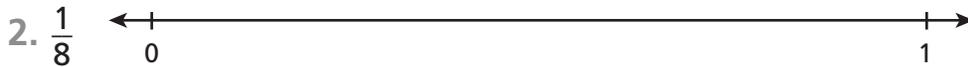
12.  $\frac{3}{8}$



## ► Locate Fractions Less Than 1

Locate each fraction on the number line.

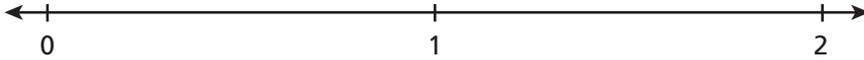
Draw more number lines if you need to.



► Locate Fractions Greater Than 1

Locate each fraction on the number line.

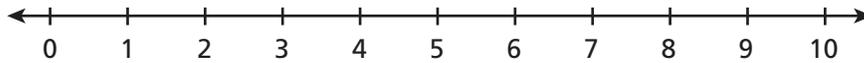
8.  $\frac{5}{4}$



9.  $\frac{8}{3}$



10.  $\frac{5}{1}$



11.  $\frac{8}{6}$



12.  $\frac{6}{2}$



13. Explain how you located the fraction for one of the Exercises from 8–12.

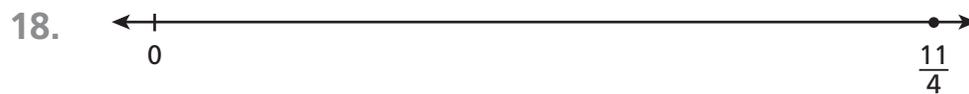
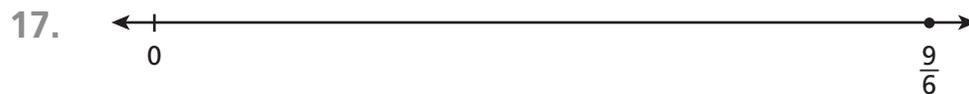
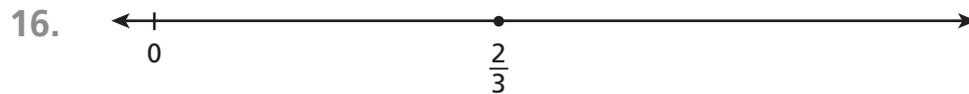
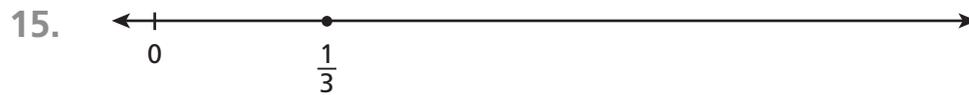
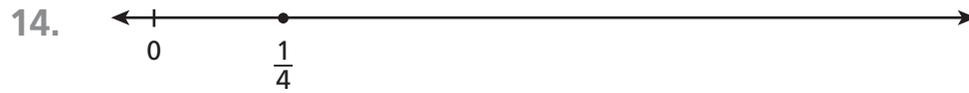
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## ► Find 1

Locate 1 on each number line.



19. Explain how you located 1 for Exercise 17.

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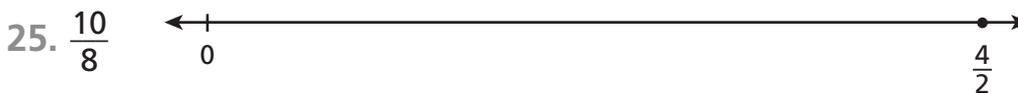
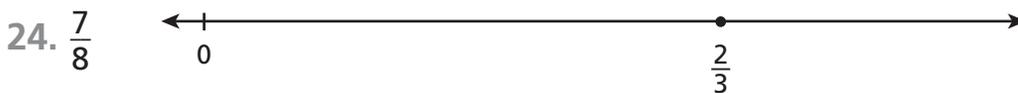
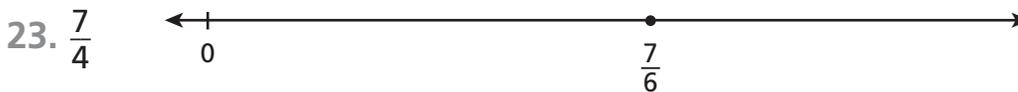
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## ► Find Fractions

Locate each fraction on the number line.

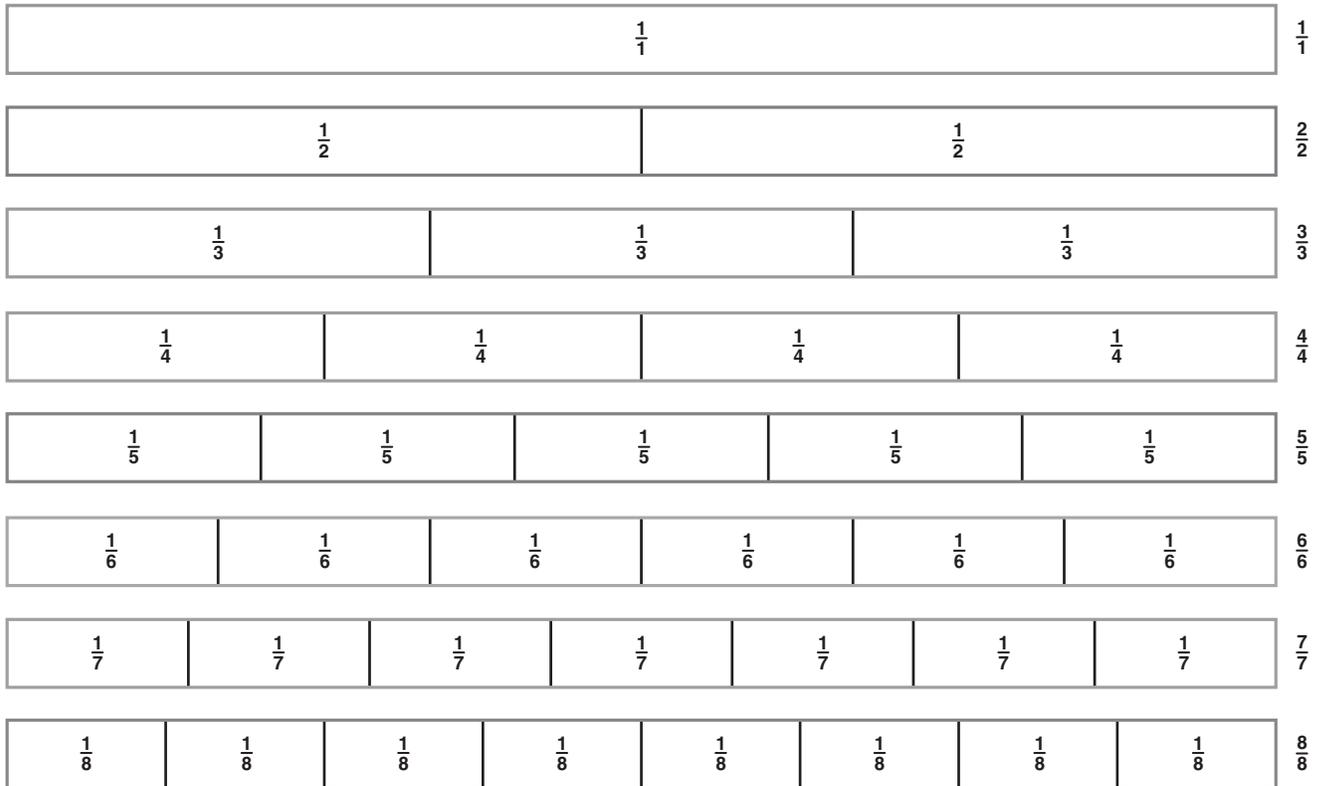
Draw another number line if you need to.



## ► Compare Unit Fractions with Fraction Bars

The fraction bars are made up of unit fractions.

Look for patterns.



1. Describe two patterns that you see in the fraction bars.

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**Compare.**

2.  $\frac{1}{3} \bigcirc \frac{1}{7}$

3.  $\frac{1}{3} \bigcirc \frac{1}{2}$

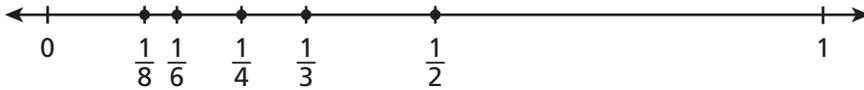
4.  $\frac{1}{6} \bigcirc \frac{1}{7}$



## ► Compare Unit Fractions with Number Lines

The number line shows unit fractions.

Look for patterns in the number line.



5. Describe a pattern that you see in the number line.

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Compare. Use the fraction bars or the number line, if needed.

6.  $\frac{1}{3} \bigcirc \frac{1}{8}$

7.  $\frac{1}{4} \bigcirc \frac{1}{2}$

8.  $\frac{1}{5} \bigcirc \frac{1}{8}$

9.  $\frac{1}{2} \bigcirc \frac{1}{8}$

10.  $\frac{1}{4} \bigcirc \frac{1}{7}$

11.  $\frac{1}{6} \bigcirc \frac{1}{8}$

Solve. Use the fraction bars or the number line.

12. Between which two unit fractions would  $\frac{1}{5}$  be on the number line?

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13. Think about making a fraction bar for tenths.

a. How many unit fractions would be in the fraction bar?

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b. How do you write the unit fraction?

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14. **Predict** Can the fraction bars for any unit fractions with even denominators always be split into two equal parts? Explain your thinking.

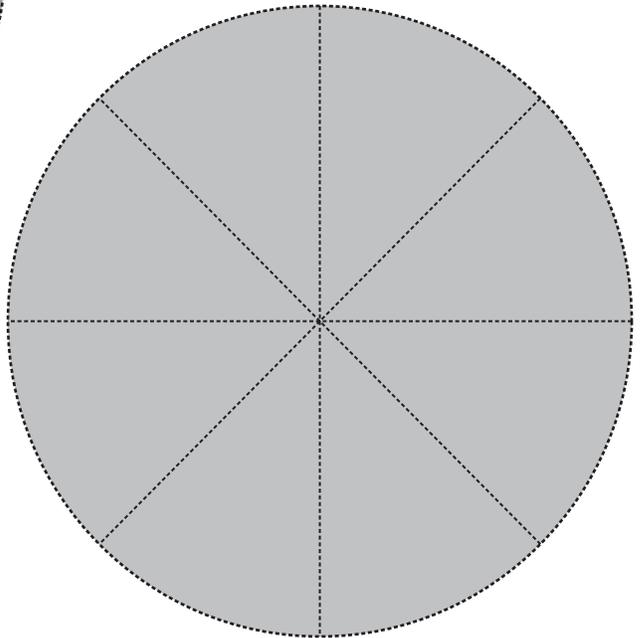
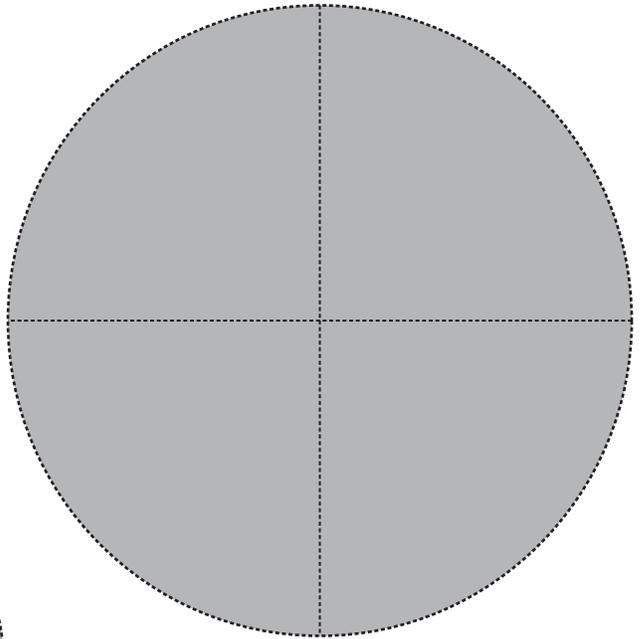
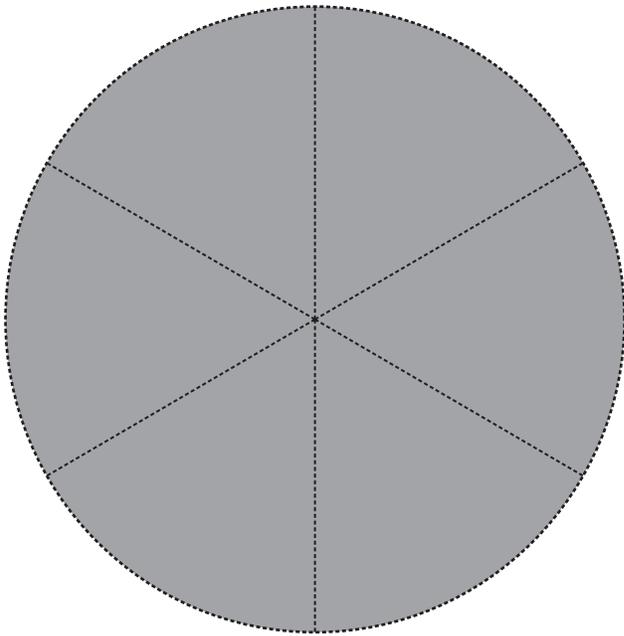
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## ► Fraction Circles

Label each unit fraction.  
Then cut out the fraction  
circles on the dashed lines.



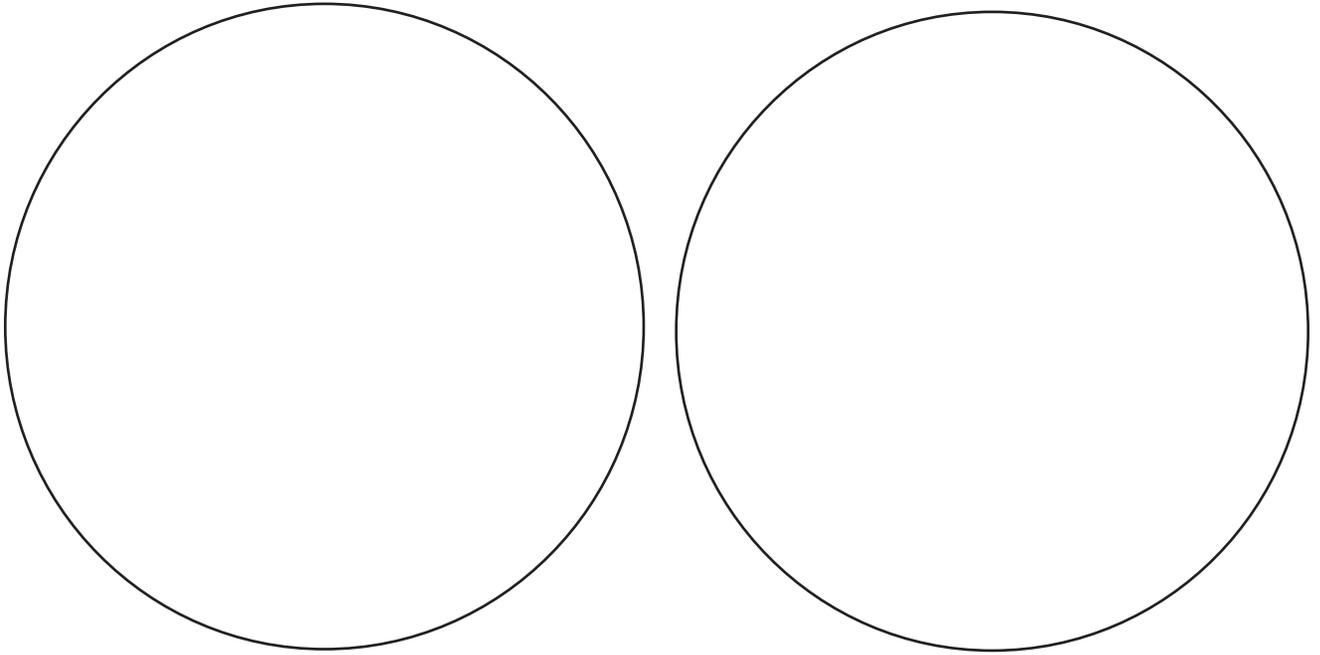


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## ► Compare Fractions

Use these two circles as wholes.

Work with a partner. Use your fraction circles to compare fractions during the class activity.



Record your work during the class activity.

1.  $\frac{7}{8} \bigcirc \frac{5}{8}$

2.  $\frac{3}{6} \bigcirc \frac{5}{6}$

3. Explain how to compare two fractions that have the same denominator.

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4.  $\frac{3}{4} \bigcirc \frac{3}{8}$

5.  $\frac{5}{8} \bigcirc \frac{5}{6}$

6. Explain how to compare two fractions that have the same numerator.

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## ► Use Symbols to Compare Fractions

Compare. Use  $<$ ,  $>$ , or  $=$ .

7.  $\frac{2}{2} \bigcirc \frac{2}{3}$

8.  $\frac{1}{3} \bigcirc \frac{5}{3}$

9.  $\frac{3}{2} \bigcirc \frac{3}{6}$

10.  $\frac{5}{6} \bigcirc \frac{4}{6}$

11.  $\frac{4}{6} \bigcirc \frac{5}{6}$

12.  $\frac{3}{4} \bigcirc \frac{3}{8}$

13.  $\frac{6}{3} \bigcirc \frac{5}{3}$

14.  $\frac{8}{4} \bigcirc \frac{8}{7}$

15.  $\frac{5}{6} \bigcirc \frac{5}{3}$

16.  $\frac{8}{5} \bigcirc \frac{12}{5}$

17.  $\frac{6}{5} \bigcirc \frac{6}{4}$

18.  $\frac{2}{2} \bigcirc \frac{4}{4}$

19.  $\frac{5}{8} \bigcirc \frac{3}{8}$

20.  $\frac{7}{3} \bigcirc \frac{7}{6}$

21.  $\frac{7}{8} \bigcirc \frac{3}{8}$

22.  $\frac{9}{4} \bigcirc \frac{9}{8}$

23.  $\frac{4}{4} \bigcirc \frac{6}{6}$

24.  $\frac{12}{7} \bigcirc \frac{11}{7}$

25.  $\frac{8}{6} \bigcirc \frac{8}{2}$

26.  $\frac{8}{1} \bigcirc \frac{12}{1}$

## ► What's the Error?

Dear Math Students,

Today my teacher asked me to compare  $\frac{3}{7}$  and  $\frac{3}{9}$  and to explain my thinking.

I wrote  $\frac{3}{7} = \frac{3}{9}$ . My thinking is that both fractions have 3 unit fractions so they must be equal.

Is my work correct? If not, please correct my work and tell me what I did wrong. How do you know my answer is wrong?

Your friend,  
Puzzled Penguin



27. Write an answer to Puzzled Penguin.

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## ► Make Fraction Strips

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## ► Halves, Fourths, and Eighths

Two fractions are **equivalent fractions** if they name the same part of a whole.

Use your halves, fourths, and eighths strips to complete Exercises 1–4.

$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{8}$							

1. If you compare your halves strip and your fourths strip, you can see that 2 fourths are the same as 1 half.

Complete these two equations:

\_\_\_\_\_ fourths = 1 half

$$\frac{\square}{4} = \frac{1}{2}$$

2. How many eighths are in one half? \_\_\_\_\_

Complete these two equations:

\_\_\_\_\_ eighths = 1 half

$$\frac{\square}{8} = \frac{1}{2}$$

3. What are two fractions that are equivalent to  $\frac{1}{2}$ ?  
\_\_\_\_\_

4. How many eighths are in one fourth? \_\_\_\_\_

Complete these two equations:

\_\_\_\_\_ eighths = 1 fourth

$$\frac{\square}{8} = \frac{1}{4}$$



## ► Thirds and Sixths

Use your thirds and sixths strips to answer Exercises 5–6.

5. How many sixths are in one third? \_\_\_\_\_

Complete these two equations:

\_\_\_\_\_ sixths = 1 third

$$\frac{\square}{6} = \frac{1}{3}$$

6. How many sixths are in two thirds? \_\_\_\_\_

Complete these two equations:

\_\_\_\_\_ sixths = 2 thirds

$$\frac{\square}{6} = \frac{2}{3}$$

## ► What's the Error?

Dear Math Students,

Today my teacher asked me to name a fraction that is equivalent to  $\frac{1}{2}$ .

I wrote  $\frac{2}{6} = \frac{1}{2}$

Is my answer correct? If not, please correct my work and tell me what I did wrong.

Your Friend,  
Puzzled Penguin



7. Write an answer to Puzzled Penguin.

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**CA CC** Content Standards **3.NF.2a, 3.NF.2b, 3.NF.3, 3.NF.3a, 3.NF.3b, 3.NF.3c** Mathematical Practices **MP.1, MP.2**

**VOCABULARY**  
equivalence chain

## ► Equivalent Fractions on Number Lines

1. Complete each number line. Show all fractions including each fraction for 1.



2. Write an **equivalence chain** with fractions that equal  $\frac{2}{2}$ .

\_\_\_\_\_

3. Why are the fractions in the equivalence chain for  $\frac{2}{2}$  equal?

\_\_\_\_\_

4. Why does the length of unit fractions grow smaller as their denominators get larger?

\_\_\_\_\_

## ► Equivalence Chains

Use your number lines from page 385 to write an equivalence chain.

5. With fractions that equal  $\frac{1}{2}$

\_\_\_\_\_

6. With fractions that equal  $\frac{1}{3}$

\_\_\_\_\_

7. With fractions that equal  $\frac{2}{3}$

\_\_\_\_\_

8. With fractions that equal  $\frac{1}{4}$

\_\_\_\_\_

9. With fractions that equal  $\frac{3}{4}$

\_\_\_\_\_

10. With fractions that equal  $\frac{8}{8}$

\_\_\_\_\_

**Solve. Use what you have learned about equivalent fractions and about comparing fractions.**

*Show your work.*

11. Jaime has  $\frac{1}{2}$  dozen red marbles and  $\frac{4}{8}$  dozen green marbles. Does he have more red or green marbles?

\_\_\_\_\_

12. Nancy buys  $\frac{3}{6}$  pound of walnuts. Sandra buys  $\frac{3}{4}$  pound of almonds. Who buys more nuts?

\_\_\_\_\_

13. Chin and Maya collected shells at the beach. They both used the same kind of basket. Chin collected  $\frac{3}{4}$  basket and Maya collected  $\frac{3}{3}$  basket. Who collected more shells?

\_\_\_\_\_

## ► Solve Fraction Problems

**Solve. Draw diagrams or number lines if you need to.** *Show your work.*

1. The shelves in Roger's bookcase are  $\frac{7}{8}$  yard long. Latanya's bookcase has shelves that are  $\frac{5}{8}$  yard long. Whose bookcase has longer shelves? How do you know?
- 

2. Rosa buys  $\frac{3}{4}$  pound of cheddar cheese. Lucy buys  $\frac{3}{8}$  pound of goat cheese. Who buys more cheese? Explain your answer.
- 

3. Martha baked  $\frac{8}{4}$  dozen cranberry muffins. Vera baked  $\frac{8}{6}$  dozen banana muffins. Who baked fewer muffins? How do you know?
- 

4. Lester walks  $\frac{3}{4}$  mile to school. Bert said that he walks farther because he walks  $\frac{6}{8}$  mile to school. Is his statement correct? Explain your answer.
- 

5. Jack's family has a pickup truck that weighs  $\frac{9}{4}$  ton. Ruth's family has a car that weighs  $\frac{9}{8}$  ton. Is the pickup truck or the car heavier? How do you know?
- 

6. Rusty painted  $\frac{5}{6}$  of a mural for the school hallway. Has he painted more than half of the mural? Explain your answer.  
*Hint: Find an equivalent fraction in sixths for  $\frac{1}{2}$ .*
-

► Solve Fraction Problems (continued)

Solve. Draw diagrams or number lines if it helps.

*Show your work.*

7. Pearl used  $\frac{3}{3}$  yard of fabric to make a pillow. Julia made her pillow from  $\frac{4}{4}$  yard of fabric. They both paid \$5 a yard for their fabric. Who paid more for fabric? How do you know?

---



---

8. At Binata's Bakery, two different recipes are used for wheat bread. For a round loaf,  $\frac{5}{2}$  cups of wheat flour is used. For a long loaf,  $\frac{7}{2}$  cups of wheat flour is used. For which kind of bread is more wheat flour used? Explain your answer.

---



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9. Deena's water bottle can hold a total of  $\frac{2}{5}$  liter of water. John's water bottle can hold a total of  $\frac{5}{2}$  liter of water. Whose water bottle holds more water? How do you know?

---



---

10. Andy, Lu, and Carlos have  $\frac{3}{3}$ ,  $\frac{3}{4}$ , and  $\frac{3}{6}$  dozen pencils, but not in that order. Andy has the fewest pencils and Lu has the most. How many pencils does each boy have? Explain.

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## ► Math and Paper Folding

The art of paper folding began in China. Later, Japan's version of paper folding, called origami, became very popular. Origami sculptures are made from a flat sheet of square paper through folding and sculpting techniques without cuts or glue.

### Complete.

1. Fold a square sheet of paper in half diagonally. What part of the square is each triangle?

---

2. Fold the paper in half again. What part of the square is each triangle?

---

3. Fold the paper in half again. Open the paper. What part of the square is each triangle?

---

4. Explain how you know the eight parts have the same area.

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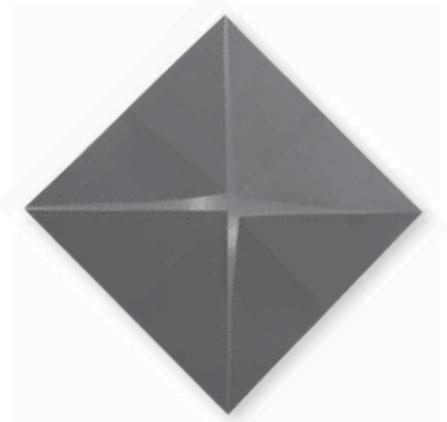
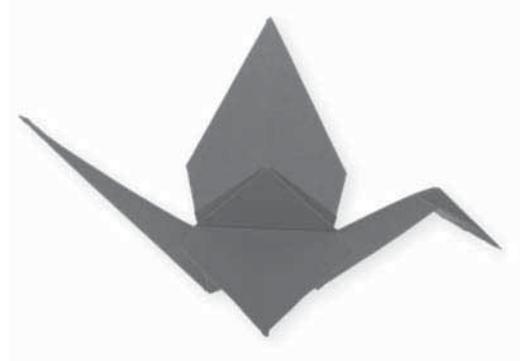
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5. Fold four triangles to the center as shown on the right. What part of the square is each triangle? Explain how you know.

---



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This basic origami fold is used for making many objects.

► Math and Design



**Complete.**

6. Fold a square sheet of paper in half three times. Open the paper. Choose two different colors. Color every other rectangle or triangle one color. Color the other rectangles or triangles the second color.
7. Write 3 equivalent fractions for the part of the square that is colored the same color.

\_\_\_\_\_

8. Predict the number of shapes you would make if you folded the square 4 times. Explain.

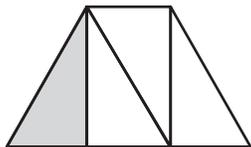
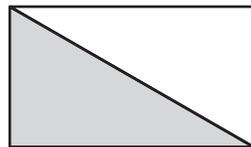
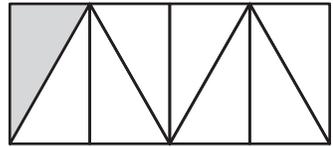
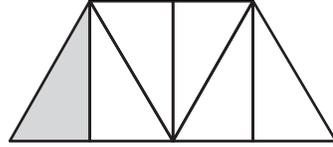
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1. Select the way that shows the shaded fraction.  
 Mark all that apply.



- (A)  $\frac{1}{4}$
- (B)  $\frac{4}{3}$
- (C)  $\frac{3}{4}$
- (D)  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$
- (E)  $\frac{4}{1} + \frac{4}{1} + \frac{4}{1}$

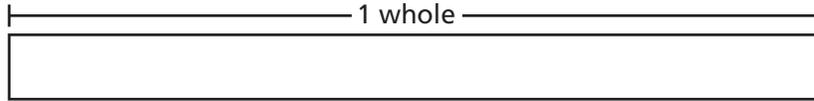
2. What unit fraction of the whole shape is the shaded triangle?  
 Draw a line from the shape to the unit fraction the shaded triangle represents.

	•		•	$\frac{1}{8}$
	•		•	$\frac{1}{6}$
	•		•	$\frac{1}{4}$
	•		•	$\frac{1}{2}$

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3. Use a straightedge to divide the fraction bar into 6 equal parts. Then shade four parts.



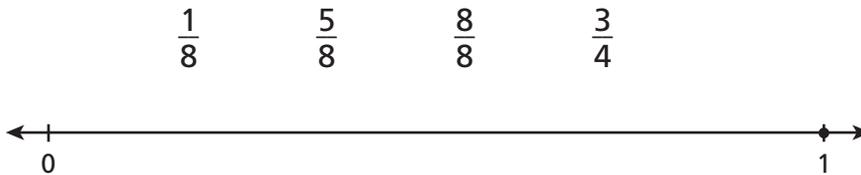
What fraction does the shaded fraction bar represent?

\_\_\_\_\_

Show the fraction as the sum of unit fractions.

\_\_\_\_\_

4. Mark the number line to show the fractions. First divide the number line into correct unit fractions.

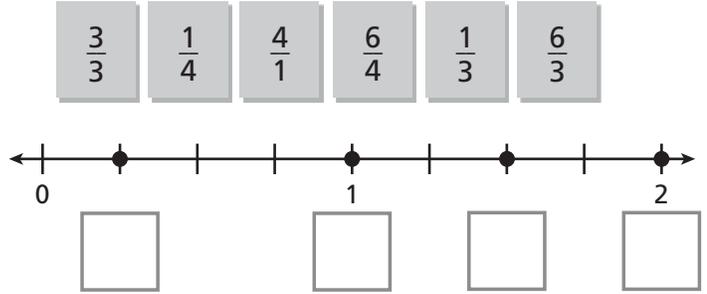


5. Write each fraction in the box to show whether it less than 1, equal to 1, or greater than 1.

$\frac{6}{1}$        $\frac{1}{3}$        $\frac{4}{4}$        $\frac{3}{2}$        $\frac{5}{6}$

Less Than 1	Equal to 1	Greater Than 1

6. Use the fractions to label each point on the number line.



7. Select the fraction that would be included in an equivalence chain for  $\frac{6}{6}$ . Mark all that apply.

- (A)  $\frac{3}{3}$
- (B)  $\frac{3}{6}$
- (C)  $\frac{4}{4}$
- (D)  $\frac{5}{5}$
- (E)  $\frac{6}{1}$

8. Choose the symbol that completes the comparison.

$$\frac{10}{3} \begin{matrix} < \\ > \\ = \end{matrix} \frac{10}{2}$$

How did you know which symbol to choose?



9. Noah compares  $\frac{1}{3}$  to other fractions.

For numbers 9a–9d, select True or False for each statement.

9a.  $\frac{1}{3} = \frac{2}{6}$        True     False

9b.  $\frac{1}{3} > \frac{1}{4}$        True     False

9c.  $\frac{1}{3} < \frac{3}{3}$        True     False

9d.  $\frac{1}{3} = \frac{3}{1}$        True     False

10. Draw a line from the fraction on the left to match the equivalent fraction or number on the right.

$\frac{4}{6}$  ●

● 8

$\frac{8}{1}$  ●

●  $\frac{2}{3}$

$\frac{3}{4}$  ●

● 1

$\frac{2}{8}$  ●

●  $\frac{6}{8}$

$\frac{2}{2}$  ●

●  $\frac{1}{4}$

11. Diane's water bottle holds  $\frac{5}{4}$  liter of water. Joe's holds  $\frac{3}{4}$  liter of water. Write a comparison.  
Which water bottle holds more water?

Comparison: \_\_\_\_\_

\_\_\_\_\_ liter

12. Tyler picks  $\frac{3}{3}$  dozen apples. Olivia picks  $\frac{5}{6}$  dozen apples. Samantha picks  $\frac{2}{3}$  dozen apples. Who picks the least number of apples?

\_\_\_\_\_

What strategy did you use to solve the problem?

13. Choose the fraction that makes the statement true.

$\frac{1}{3}$  would be between  $\frac{1}{2}$   
 $\frac{2}{3}$   
 $\frac{1}{5}$  and  $\frac{1}{4}$  on a number line.

14. Alyssa wants to write a fraction that is greater than  $\frac{1}{6}$ .

For numbers 14a–14d, choose Yes or No to tell whether Alyssa can write the fraction.

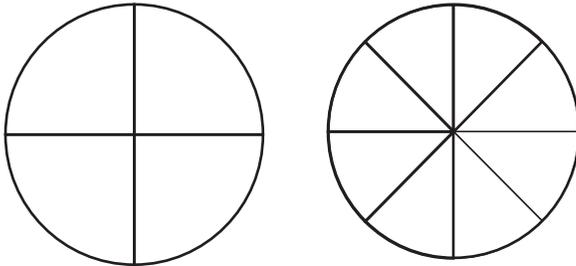
- 14a.  $\frac{2}{1}$                        Yes     No
- 14b.  $\frac{1}{8}$                          Yes     No
- 14c.  $\frac{1}{5}$                          Yes     No
- 14d.  $\frac{8}{2}$                          Yes     No



15. Dan walks  $\frac{5}{8}$  mile to school. Beth walks  $\frac{3}{4}$  mile to school.

**Part A**

Who walks farther? Label and shade the circles to help solve the problem.



\_\_\_\_\_ walks farther.

**Part B**

Suppose Dan walks  $\frac{6}{8}$  mile instead of  $\frac{5}{8}$  mile. Who walks farther? How do the circles help you decide?

16. Henry and Reiko both use 1 yard of ribbon to make bows. Write two different fractions to show that Henry and Reiko use the same amount of ribbon.

Henry uses \_\_\_\_\_ yard.

Reiko uses \_\_\_\_\_ yard.