

11

Understand Fraction Equivalence and Comparison

- Do you like to cook? What is your favorite recipe?
- How do you use fractions when cooking? Why is it important to understand fractions when following a recipe?

Chapter Learning Target:

Understand fractions.

Chapter Success Criteria:

- I can define a fraction.
- I can find fractions on a number line.
- I can explain how to use a number line to find fractions.
- I can compare fractions on a number line.

11

Name _____

Vocabulary

Review Words




eighths
sixths
unit fraction
whole

Organize It

Use the review words to complete the graphic organizer.

Fraction

A number that represents
part of a

<input type="text"/>		$\frac{1}{3}$
<input type="text"/>		$\frac{2}{6}$
<input type="text"/>		$\frac{6}{8}$

Define It

Use your vocabulary cards to complete the definitions.

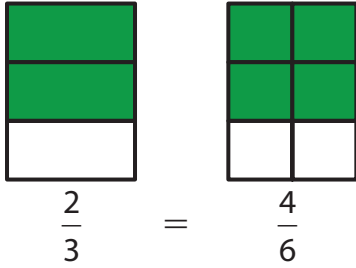
1. equivalent: Having the same _____
2. equivalent fractions: Two or more _____ that name the same _____ of a _____

Chapter 11 Vocabulary Cards

equivalent

equivalent
fractions

Two or more fractions that name the same part of a whole



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Having the same value

$$\frac{8}{8} = 1$$
$$3 = \frac{3}{1}$$
$$2 = \frac{4}{2} = \frac{6}{3}$$

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Learning Target: Model and write equivalent fractions.**Success Criteria:**

- I can model equivalent fractions.
- I can write equivalent fractions.



Explore and Grow

Use the model to write fractions that are the same size as $\frac{1}{2}$.

1 whole							
$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{3}$			$\frac{1}{3}$			$\frac{1}{3}$	
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$	
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$



Reasoning Can you write a fraction with a denominator of 8 that is the same size as $\frac{3}{4}$? Explain.

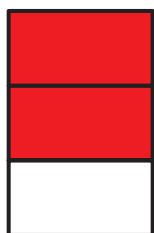


Think and Grow: Model Equivalent Fractions

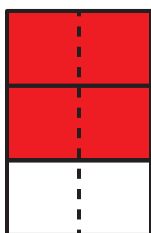
Two or more numbers that have the same value are **equivalent**. Two or more fractions that name the same part of a whole are **equivalent fractions**.

Example Use the models to find an equivalent fraction for $\frac{2}{3}$.

Both models show the same whole.



$$\frac{2}{3}$$



$$\frac{\square}{6}$$

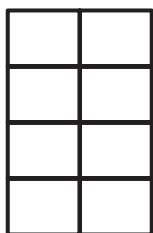
The shaded parts show the same part of the whole.

$\frac{2}{3}$ and $\frac{\square}{6}$ are equivalent fractions. So, $\frac{2}{3} = \frac{\square}{6}$.

Show and Grow

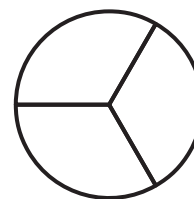
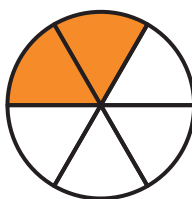
Use the models to find an equivalent fraction. Both models show the same whole.

1.



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

2.



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

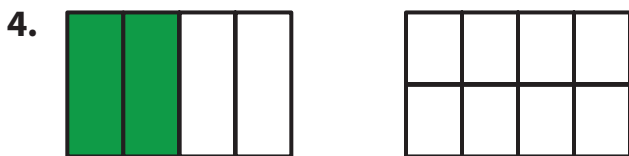
3. Shade 1 part of the model. Then divide the model into 4 equal parts. Write the equivalent fraction.



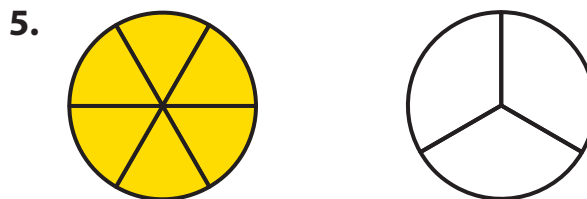
$$\frac{1}{2} = \frac{\square}{\square}$$

Apply and Grow: Practice

Use models to find an equivalent fraction. Both models show the same whole.

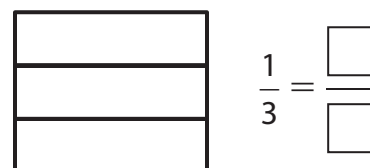


$$\frac{2}{4} = \frac{\square}{\square}$$



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

6. Shade 1 part of the model. Then divide the model into 6 equal parts. Write the equivalent fraction.



Find the equivalent fraction.

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

8. $\frac{4}{4} = \frac{\square}{2}$

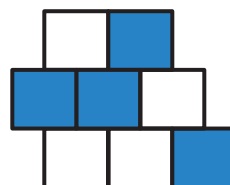
9. $\frac{2}{3} = \frac{\square}{6}$

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

11. **MP Structure** Descartes shades $\frac{3}{4}$ of a rectangle. Divide and shade the model to show an equivalent fraction for $\frac{3}{4}$.



12. **Which One Doesn't Belong?** Which model does *not* belong with the other three?





Think and Grow: Modeling Real Life

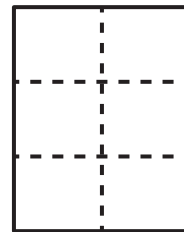
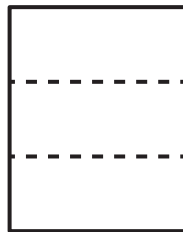
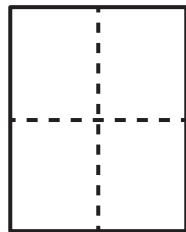
You, Newton, and Descartes divide your posters for a science fair as shown. You finish 3 parts, Newton finishes 2 parts, and Descartes finishes 4 parts. Who has finished the same amount?

Model:

You

Newton

Descartes



Fraction finished:

 $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$

_____ and _____ finish the same amount.

Show and Grow

13. You, Newton, and Descartes divide your submarine sandwiches as shown. You eat 1 part, Newton eats 2 parts, and Descartes eats 2 parts. Who eats the same amount?

You

Newton

Descartes



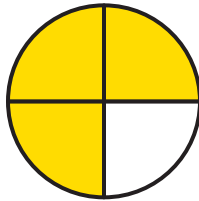
14. **DIG DEEPER!** You and your friend have small pizzas. You cut your pizza into sixths. Your friend cuts her pizza into eighths. You eat $\frac{3}{6}$ of your pizza. Your friend eats the same amount of her pizza. What fraction of her pizza does your friend eat? How many slices does your friend eat? Explain.

Learning Target: Model and write equivalent fractions.

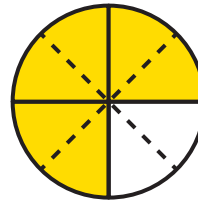
Example Use the models to find an equivalent fraction for $\frac{3}{4}$.



Both models show the same whole.



$$\frac{3}{4}$$

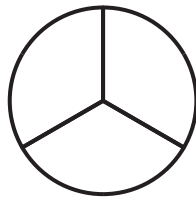
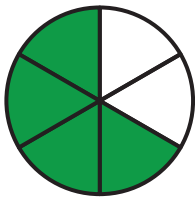


$$\frac{6}{8}$$

$\frac{3}{4}$ and $\frac{6}{8}$ are equivalent fractions. So, $\frac{3}{4} = \frac{6}{8}$.

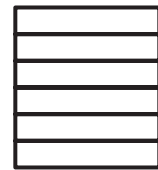
Use models to find an equivalent fraction. Both models show the same whole.

1.



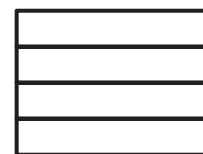
$$\frac{4}{6} = \frac{\square}{\square}$$

2.



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

3. Shade 1 part of the model. Then divide the model into 8 equal parts. Write the equivalent fraction.



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

Find the equivalent fraction.

4. $\frac{2}{2} = \frac{\square}{8}$

5. $\frac{6}{8} = \frac{\square}{4}$

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

7. $\frac{2}{4} = \frac{\square}{2}$

8. **Open-Ended** Divide one model into an odd number of equal parts and the other model into an even number of equal parts. Then model and write two equivalent fractions.



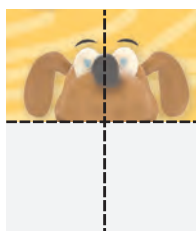
$$\frac{\square}{\square} = \frac{\square}{\square}$$

9. **Modeling Real Life** You, Newton, and Descartes divide your portrait canvases as shown. You paint 2 parts, Newton paints 2 parts, and Descartes paints 8 parts. Who paints the same amount of the portrait canvas?

You



Newton



Descartes



10. **DIG DEEPER!** You and your friend paint 2 roundabouts for a park. You divide your roundabout into thirds. Your friend divides his roundabout into sixths. You paint $\frac{1}{3}$ of your roundabout. Your friend paints the same amount of his roundabout. What fraction does your friend paint? Explain.



Review & Refresh

11. Round to the nearest ten to estimate the sum.

$$\begin{array}{r} 431 \\ + 109 \\ \hline \end{array} \quad \begin{array}{r} \square \\ + \square \\ \hline \square \end{array}$$

12. Round to the nearest hundred to estimate the sum.

$$\begin{array}{r} 551 \\ + 268 \\ \hline \end{array} \quad \begin{array}{r} \square \\ + \square \\ \hline \square \end{array}$$

Learning Target: Use a number line to find equivalent fractions.

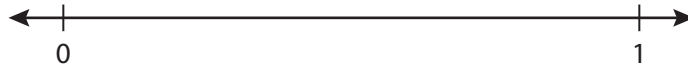
Success Criteria:

- I can plot fractions on a number line.
- I can find equivalent fractions on a number line.
- I can explain how to use a number line to find equivalent fractions.



Explore and Grow

Use Fraction Strips to label thirds on the number line.



Use Fraction Strips to label sixths on the number line.



Use the number lines to complete the equivalent fraction.

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



Structure How can you tell whether fractions are equivalent using a number line?

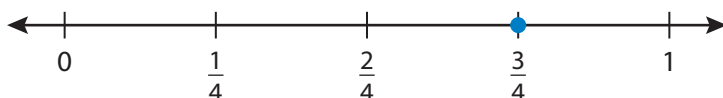


Think and Grow: Equivalent Fractions on a Number Line

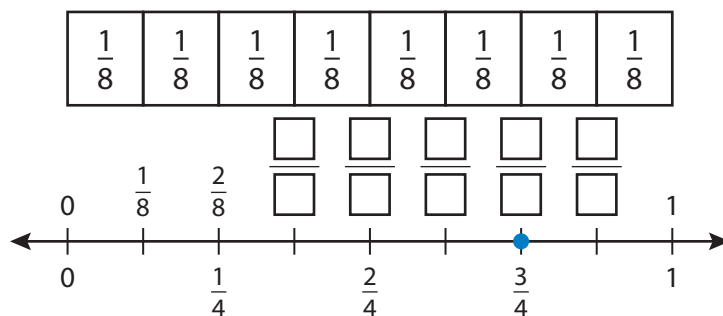
You can use a number line to find equivalent fractions. Equivalent fractions represent the same point on a number line.

Example Use a number line to find an equivalent fraction for $\frac{3}{4}$.

Step 1: Plot $\frac{3}{4}$ on a number line.



Step 2: Divide the number line into eighths. Label each tick mark to show eighths.



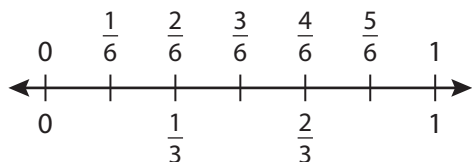
Remember that a number line can be divided into any number of equal parts.



The fractions that name the same point are $\frac{3}{4}$ and $\frac{\square}{\square}$. So, $\frac{3}{4} = \frac{\square}{\square}$.

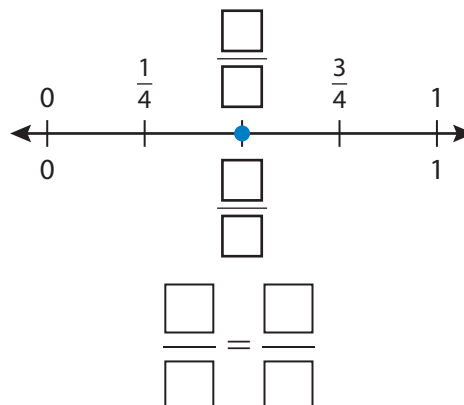
Show and Grow

1. Use the number line to find an equivalent fraction.



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

2. Write two fractions that name the point shown.



Apply and Grow: Practice

Write two fractions that name the point shown.

3.

$\frac{\square}{\square} = \frac{\square}{\square}$

4.

$\frac{\square}{\square} = \frac{\square}{\square}$

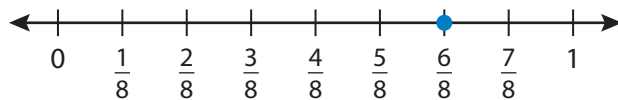
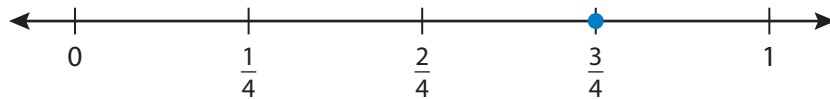
5.

$\frac{\square}{\square} = \frac{\square}{\square}$

6.

$\frac{\square}{\square} = \frac{\square}{\square}$

7. **YOU BE THE TEACHER** Your friend says $\frac{3}{4}$ and $\frac{6}{8}$ are *not* equivalent because they are not the same distance from 0. Is your friend correct? Explain.



8. **MP Reasoning** Explain why $\frac{1}{3}$ is equal to two $\frac{1}{6}$ s.



Think and Grow: Modeling Real Life

Newton rests after biking $\frac{2}{3}$ of a race. Descartes rests after biking $\frac{2}{6}$ of the same race. Do they rest at the same point along the race path?



Model:



They _____ rest at the same point.

Explain:

Show and Grow

9. Newton hikes $\frac{7}{8}$ of a trail. Descartes hikes $\frac{3}{4}$ of the same trail. Do they hike the same distance along the trail?

10. Newton chases Descartes for $\frac{3}{6}$ mile. Descartes turns around and chases Newton an equal distance. Write two equivalent fractions that can describe how far Descartes chases Newton.

11. **DIG DEEPER!** You cut a quiche into 8 equal slices. Your family eats $\frac{1}{2}$ of the quiche. How many slices does your family eat? Explain.

Learning Target: Use a number line to find equivalent fractions.

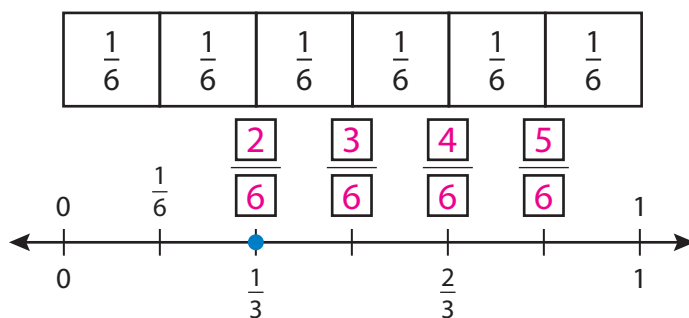


Example Use a number line to find an equivalent fraction for $\frac{1}{3}$.

Step 1: Plot $\frac{1}{3}$ on the number line.

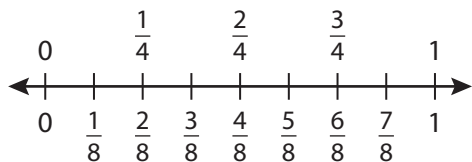


Step 2: Divide the number line into sixths. Label each tick mark to show sixths.



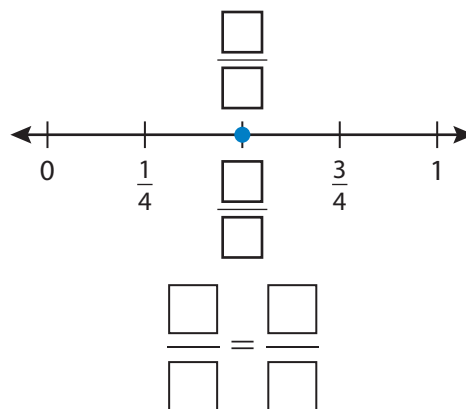
The fractions that name the same points are $\frac{1}{3}$ and $\frac{2}{6}$. So, $\frac{1}{3} = \frac{2}{6}$.

1. Use the number line to find an equivalent fraction.



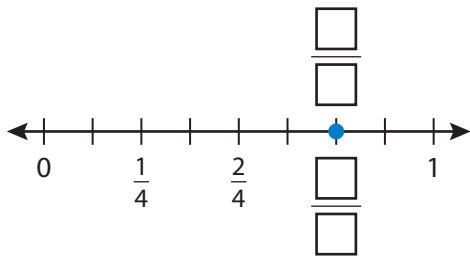
$$\frac{2}{8} = \frac{\square}{\square}$$

2. Write two fractions that name the point shown.



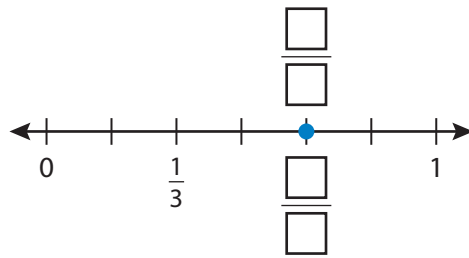
Write two fractions that name the same point shown.

3.



$$\frac{\square}{\square} = \frac{\square}{\square}$$

4.



$$\frac{\square}{\square} = \frac{\square}{\square}$$

5. **Which One Doesn't Belong?** Which fraction does *not* belong with the other three? Explain.

$$\frac{2}{4}$$

$$\frac{3}{6}$$

$$\frac{2}{3}$$

$$\frac{4}{8}$$

6. **MP Reasoning** How do you know that $\frac{3}{8}$ and $\frac{3}{4}$ are *not* equivalent when plotting the fractions on a number line?

7. **Modeling Real Life** You run $\frac{6}{8}$ of a race. Your friend runs $\frac{3}{4}$ of the same race. Do you and your friend run the same distance?

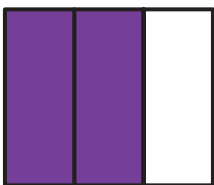


8. **DIG DEEPER!** You have a frame that holds 8 pictures. You fill $\frac{1}{4}$ of the frame. How many pictures do you put in the frame? Explain.

Review & Refresh

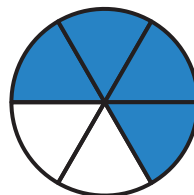
What fraction of the whole is shaded?

9.



$\frac{\square}{\square}$ is shaded.

10.



$\frac{\square}{\square}$ is shaded.

Learning Target: Relate fractions and whole numbers.

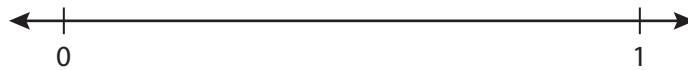
Success Criteria:

- I can label fractions on a number line.
- I can write whole numbers as fractions.
- I can use a number line to relate fractions and whole numbers.

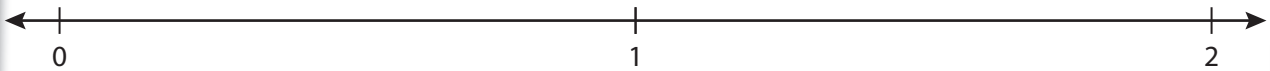


Explore and Grow

Use Fraction Strips to complete the fractions. Draw to show your models.



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



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



Repeated Reasoning How many more fourths did you use to model 2 than you did to model 1? How many more fourths would you need to model 3? Complete the fraction.

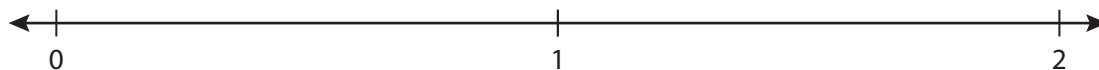
$$3 = \frac{\square}{4}$$



Think and Grow: Equivalent Fractions and Whole Numbers

Example Write the numbers 1 and 2 as fractions.

The number line shows 2 wholes. Each whole is divided into 1 equal part.

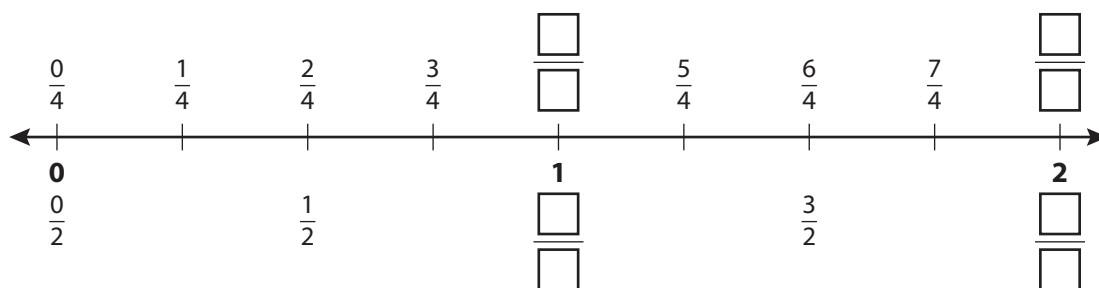


1 whole divided into 1 equal part can be written as $\frac{\square}{1}$.

2 wholes each divided into 1 equal part can be written as $\frac{\square}{1}$.

So, $1 = \frac{\square}{1}$ and $2 = \frac{\square}{1}$.

Example Write equivalent fractions for the numbers 1 and 2.

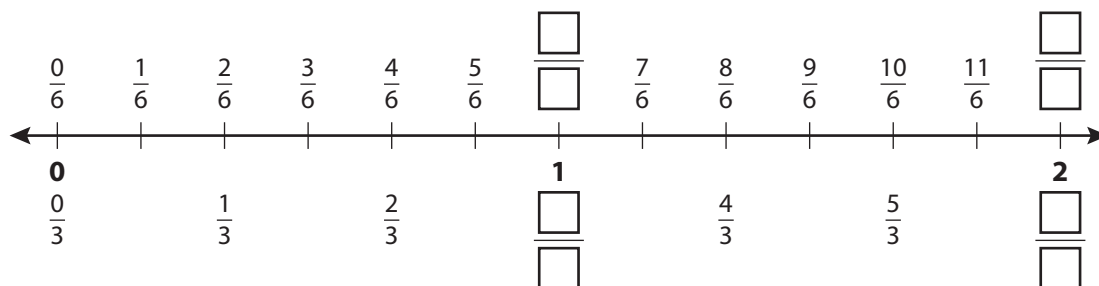


$$1 = \frac{\square}{1} = \frac{\square}{2} = \frac{\square}{4}$$

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

Show and Grow

1. Complete the number line. Then complete the statements.

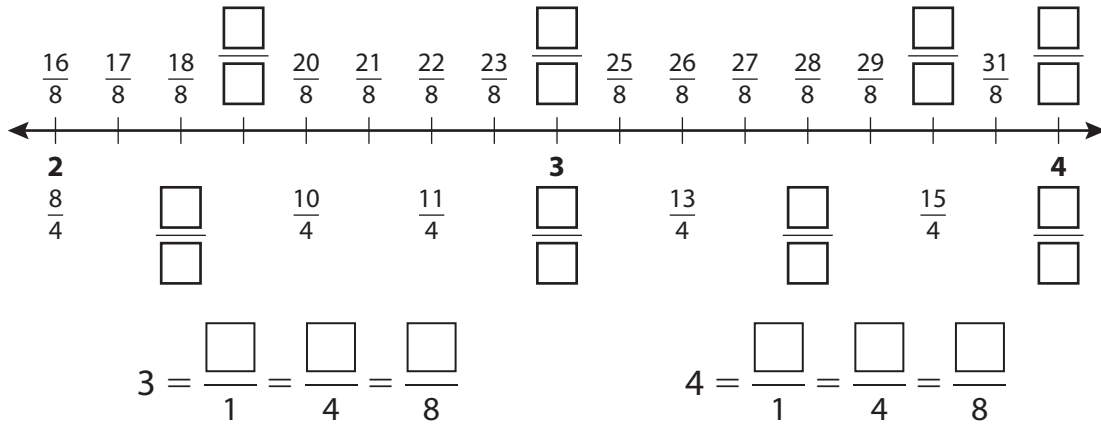


$$1 = \frac{\square}{1} = \frac{\square}{3} = \frac{\square}{6}$$

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

Apply and Grow: Practice

2. Complete the number line. Then write equivalent fractions for the numbers 3 and 4.



Write two equivalent fractions for the whole number.

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

4. $1 = \frac{\square}{2} = \frac{\square}{3}$

5. $3 = \frac{\square}{1} = \frac{\square}{2}$

Write the equivalent whole number.

6. $\frac{16}{2} = \frac{8}{1} = \square$

7. $\frac{4}{4} = \frac{6}{6} = \square$

8. $\frac{16}{4} = \frac{12}{3} = \square$

9. You cut a sandwich into 4 pieces. You eat the whole sandwich. What fraction of the sandwich do you eat?



10. **MP Number Sense** Write three fractions that are equivalent to 6 using the denominators 1, 2, and 6.

11. **MP Structure** Use a number line to show $\frac{5}{5} = 1$.



Think and Grow: Modeling Real Life

You run around a track 12 times. Each lap is $\frac{1}{4}$ mile. How many miles do you run? Write your answer as a whole number and as a fraction.

Model:



You run _____ or _____ miles.

Show and Grow

12. You ride your bike around a city block 24 times. Each time around is $\frac{1}{6}$ mile. How many miles do you ride? Write your answer as a whole number and as a fraction.

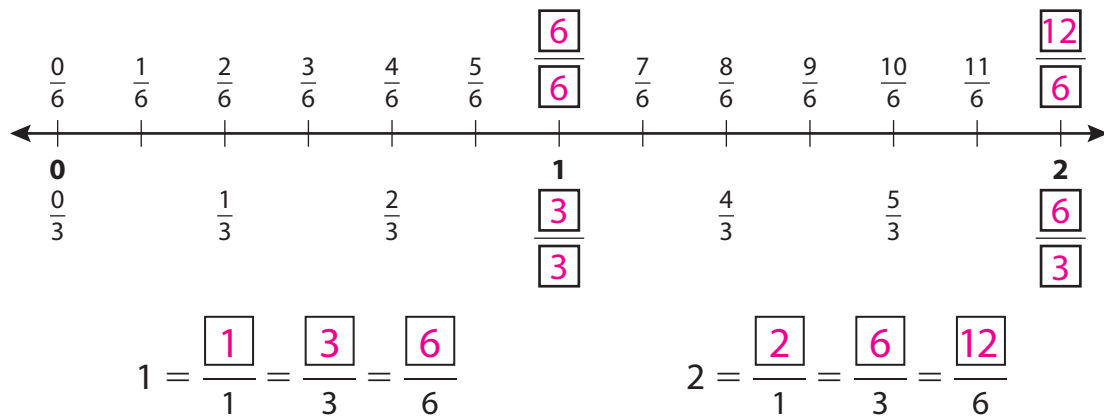
13. There are 5 Great Lakes: Lake Erie, Lake Huron, Lake Michigan, Lake Ontario, and Lake Superior. You complete a project and use 1 whole poster for each lake. Write a fraction that gives the number of posters you use in all.



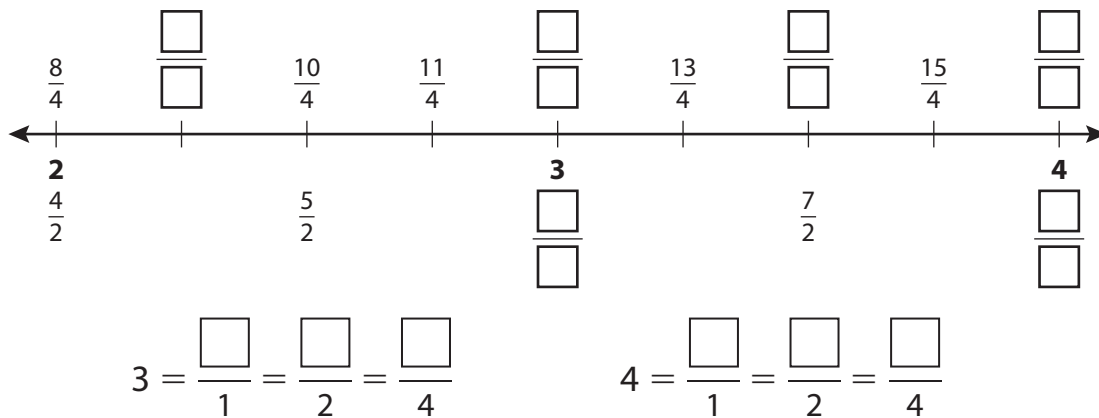
14. **DIG DEEPER!** You and your friends order 3 pizzas. Each pizza is cut into 8 slices. You and your friends eat $\frac{16}{8}$ of the pizzas. Write a fraction that shows the number of eighths that are left.

Learning Target: Relate fractions and whole numbers.

Example Write equivalent fractions for the numbers 1 and 2.



1. Complete the number line. Then write equivalent fractions for the numbers 3 and 4.



Write two equivalent fractions for the whole number.

2. $1 = \frac{\square}{3} = \frac{\square}{8}$ 3. $4 = \frac{\square}{1} = \frac{\square}{2}$ 4. $3 = \frac{\square}{4} = \frac{\square}{6}$

Write the equivalent whole number.

5. $\frac{4}{2} = \frac{2}{1} = \square$ 6. $\frac{3}{3} = \frac{8}{8} = \square$ 7. $\frac{18}{3} = \frac{12}{2} = \square$

8. **MP Precision** Match each whole number to its equivalent fractions.

4

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

1

$\frac{9}{3}$ and $\frac{6}{2}$

3

$\frac{6}{6}$ and $\frac{3}{3}$

9. **YOU BE THE TEACHER** Descartes says a fraction equivalent to $\frac{3}{1}$ has a 3 in the denominator and a 1 in the numerator. Is Descartes correct? Explain.

10. **MP Patterns** Describe and complete the pattern.

$$\frac{8}{8}, \frac{16}{8}, \frac{24}{8}, \frac{\square}{8}, \frac{\square}{8}$$

11. **Modeling Real Life** You run around a park 18 times. Each lap is $\frac{1}{6}$ mile. How many miles do you run? Write your answer as a whole number and as a fraction.

12. **Modeling Real Life** Christopher Columbus had 3 ships on his first voyage: the *Niña*, the *Pinta*, and the *Santa Maria*. You complete a project and use 1 whole poster for each ship. Write a fraction that gives the number of posters you use in all.

13. **DIG DEEPER!** A teacher has 4 tables. Each table is divided into 4 sections. $\frac{12}{4}$ of the tables have supplies on them. Write a fraction that shows the number of fourths that do *not* have supplies on them.

Review & Refresh

Estimate. Then find the sum. Check whether your answer is reasonable.

14. Estimate: _____

$$\begin{array}{r} 837 \\ + 46 \\ \hline \end{array}$$

15. Estimate: _____

$$\begin{array}{r} 396 \\ + 108 \\ \hline \end{array}$$

16. Estimate: _____

$$\begin{array}{r} 551 \\ + 279 \\ \hline \end{array}$$

Name _____

Compare Fractions with the Same Denominator

11.4

Learning Target: Compare fractions that have the same denominator.

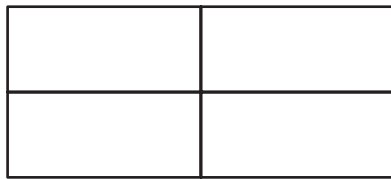
Success Criteria:

- I can model fractions that have the same denominator.
- I can use the numerators to compare fractions.
- I can explain how to compare fractions that have the same denominator.

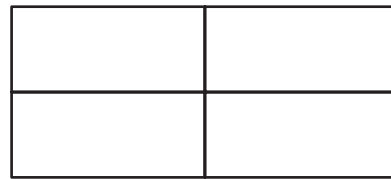


Explore and Grow

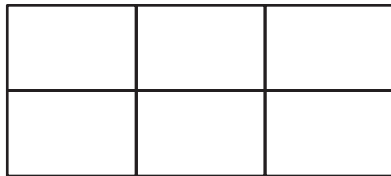
Color to show each fraction. Circle the greater fraction.



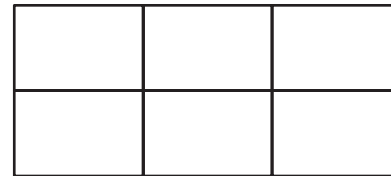
$$\frac{1}{4}$$



$$\frac{3}{4}$$



$$\frac{5}{6}$$



$$\frac{2}{6}$$



Construct Arguments Explain to your partner how you can compare fractions with the same denominator.



Think and Grow: Compare Fractions That Have the Same Denominator

Example Compare $\frac{3}{8}$ and $\frac{7}{8}$.

One Way: Use Fraction Strips.

The fractions have the same denominator, 8.

Three $\frac{1}{8}$ s is $\frac{3}{8}$. Seven $\frac{1}{8}$ s is $\frac{7}{8}$. Shade the Fraction Strips.

	1							
$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{7}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

More $\frac{1}{8}$ s are shaded to show $\frac{7}{8}$.

So, $\frac{3}{8}$ is _____ $\frac{7}{8}$, and $\frac{3}{8} \bigcirc \frac{7}{8}$.

You can only compare two fractions when they both refer to the same whole.



Another Way: When the denominators are the same, the whole is divided into the same number of equal parts. So, look at the numerators 3 and 7 to compare. The fraction with the greater numerator is the greater fraction.

Because $3 \bigcirc 7$, $\frac{3}{8} \bigcirc \frac{7}{8}$.

Show and Grow

Shade to compare the fractions.

1.

1					
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

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

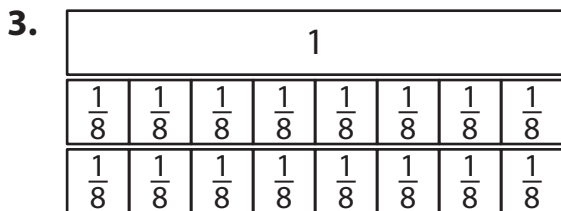
2.

1		
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

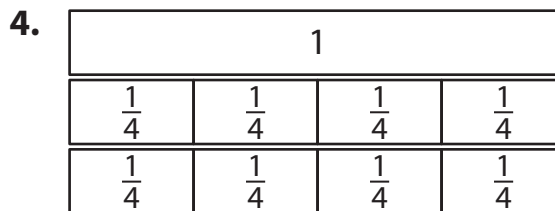
$\frac{1}{3} \bigcirc \frac{3}{3}$

Apply and Grow: Practice

Shade to compare the fractions.



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



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

Compare.

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

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

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

8. $\frac{4}{6} \bigcirc \frac{2}{6}$

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

10. $\frac{0}{4} \bigcirc \frac{1}{4}$

11. **MP Number Sense** Which statements are true?

$$\frac{2}{3} ? \frac{3}{3}$$

$$\frac{5}{6} ? \frac{1}{6}$$

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

$$\frac{2}{2} ? \frac{1}{2}$$

12. **Writing** How can you show that $\frac{3}{8}$ is less than $\frac{6}{8}$?

13. **MP Structure** Which statement correctly compares the fraction of circles shaded in Group A to the fraction of circles shaded in Group B?



$$\frac{3}{10} > \frac{6}{10}$$

$$\frac{6}{10} > \frac{3}{10}$$

$$\frac{5}{10} > \frac{8}{10}$$

$$\frac{5}{10} < \frac{3}{10}$$



Think and Grow: Modeling Real Life

Newton and Descartes have the same number of chores. Newton finishes $\frac{2}{3}$ of his chores. Descartes finishes $\frac{1}{3}$ of his chores. Who finishes more of his chores?

Model:

_____ finishes more of his chores.

Explain:

Show and Grow

14. At the pet store, a green lizard is $\frac{5}{6}$ foot long. A brown lizard is $\frac{6}{6}$ foot long. You pick up the longer lizard. Which lizard do you pick up?

15. You and a friend each have a burrito. The burritos are the same size. You eat $\frac{3}{4}$ of your burrito. Your friend eats $\frac{1}{4}$ of his burrito. Who has less burrito left to eat? Explain.

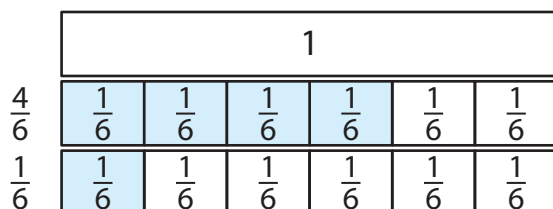


16. **DIG DEEPER!** You walk $\frac{5}{8}$ of the distance to the library from your home. Your friend walks $\frac{5}{8}$ of the distance to school from his home. You walk a greater distance than your friend. Explain how this is possible.

Learning Target: Compare fractions that have the same denominator.

Example Compare $\frac{4}{6}$ and $\frac{1}{6}$.

One Way: Use Fractions Strips.



More $\frac{1}{6}$ s are shaded to show $\frac{4}{6}$.

So, $\frac{4}{6}$ is **greater than** $\frac{1}{6}$ and $\frac{4}{6} > \frac{1}{6}$.

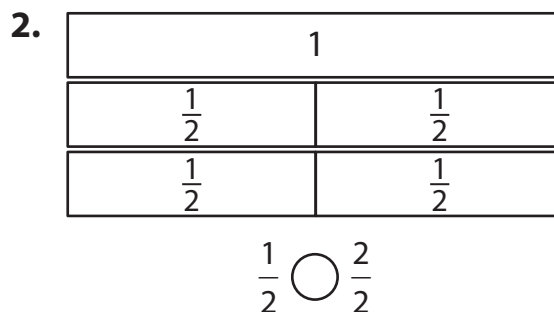
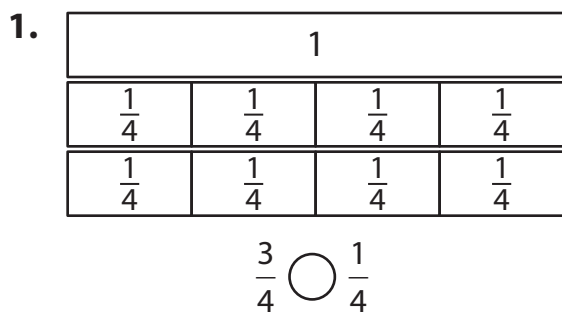
Another Way:

When the denominators are the same, the whole is divided into the same number of equal parts. So, look at the numerators to compare. The fraction with the greater numerator is the greater fraction.

Because $4 > 1$, $\frac{4}{6} > \frac{1}{6}$.



Shade to compare the fractions.



Compare.

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

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

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

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

7. $\frac{0}{3} \bigcirc \frac{1}{3}$

8. $\frac{3}{6} \bigcirc \frac{4}{6}$

9. **YOU BE THE TEACHER** Your friend says $\frac{3}{4} > \frac{2}{4}$. Is your friend correct? Explain.

10. **MP Logic** Two fractions are equivalent and have the same denominator. What must be true about the numerators of the fractions?

Open-Ended Write a number to make the statement true.

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

$\star = \underline{\quad}$

12. $\frac{\blacktriangle}{4} > \frac{2}{4}$

$\blacktriangle = \underline{\quad}$

13. $\frac{\bullet}{6} < \frac{4}{6}$

$\bullet = \underline{\quad}$

14. **Modeling Real Life** You and your friend had the same number of baby teeth. You have lost $\frac{3}{4}$ of your baby teeth. Your friend has lost $\frac{2}{4}$ of her baby teeth. Who has lost more teeth?



15. **Modeling Real Life** Two classes each paint a mural. The murals are the same size. The third-grade class paints $\frac{5}{8}$ of one mural. The fourth-grade class paints $\frac{7}{8}$ of the other mural. Which class has less left to paint? Explain.

Review & Refresh

Find the product.

16. $9 \times 80 = \underline{\quad}$

17. $5 \times 30 = \underline{\quad}$

18. $6 \times 40 = \underline{\quad}$

Name _____

Compare Fractions with the Same Numerator

11.5

Learning Target: Compare fractions that have the same numerator.

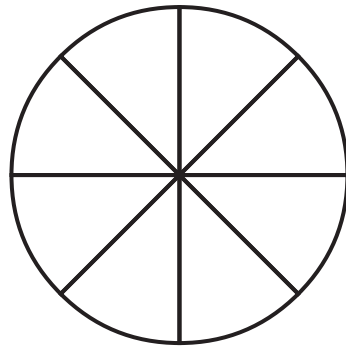
Success Criteria:

- I can model fractions that have the same numerator.
- I can use the denominators to compare fractions.
- I can explain how to compare fractions that have the same numerator.

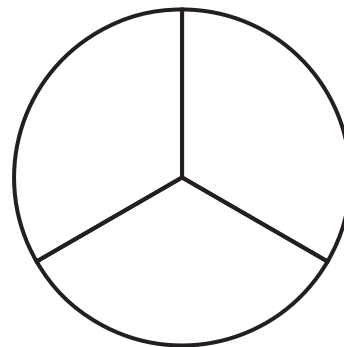


Explore and Grow

Color to show each fraction. Circle the greater fraction.



$$\frac{1}{8}$$



$$\frac{1}{3}$$



Precision How can you use Fraction Strips to check your answer? Draw to show.



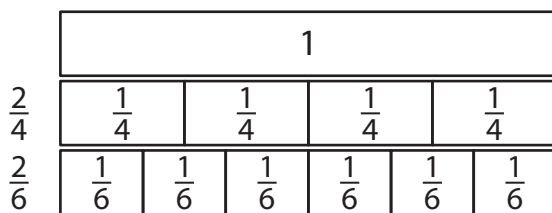
Think and Grow: Compare Fractions That Have the Same Numerator

Example Compare $\frac{2}{4}$ and $\frac{2}{6}$.

One Way: Use Fraction Strips.

Both fractions have the same numerator, 2. Two $\frac{1}{4}$'s is $\frac{2}{4}$. Two $\frac{1}{6}$'s is $\frac{2}{6}$.

Shade the Fraction Strips. Compare the parts.



So, $\frac{2}{4}$ is _____ $\frac{2}{6}$, and $\frac{2}{4} \bigcirc \frac{2}{6}$.

Think: $\frac{1}{6}$ is not as long as $\frac{1}{4}$.



Another Way: When the numerators are the same, look at the denominators 4 and 6 to compare the sizes of the parts.

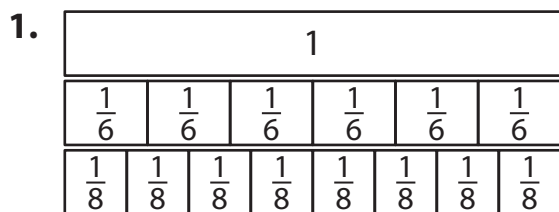
- The more parts the whole is divided into, the smaller the parts are.
- The fewer parts the whole is divided into, the larger the parts are.

The fraction with the greater denominator is the lesser fraction.

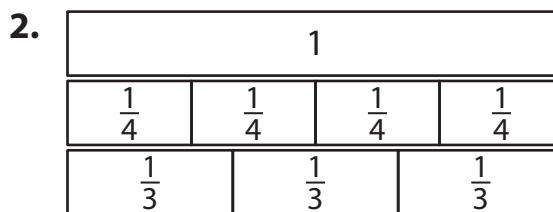
So, $\frac{1}{4}$ is _____ $\frac{1}{6}$, and $\frac{2}{4} \bigcirc \frac{2}{6}$.

Show and Grow

Shade to compare the fractions.



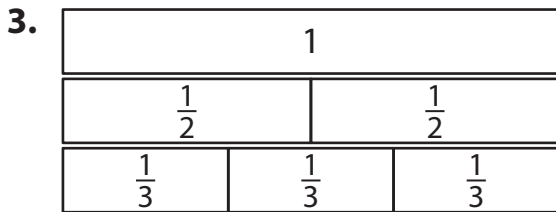
$\frac{3}{6} \bigcirc \frac{3}{8}$



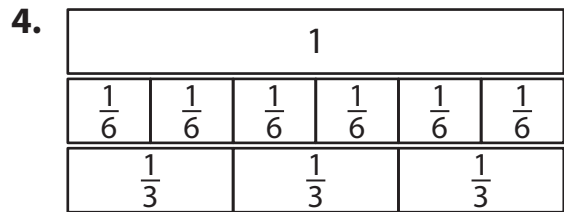
$\frac{2}{4} \bigcirc \frac{2}{3}$

 **Apply and Grow: Practice**

Shade to compare the fractions.



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



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

Compare.

5. $\frac{2}{6} \bigcirc \frac{2}{4}$

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

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

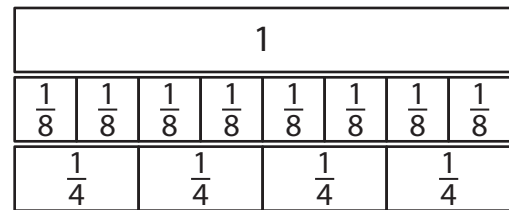
8. $\frac{2}{3} \bigcirc \frac{2}{4}$

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

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

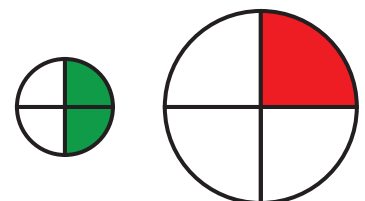
11. Use the models to compare two fractions that have the same numerators.

	○	



12. You spend $\frac{2}{3}$ of an hour playing soccer on Wednesday. You spend $\frac{2}{6}$ of an hour playing soccer on Friday. On which day do you spend more time playing soccer? Explain.

13. **YOU BE THE TEACHER** Your friend says $\frac{1}{4} > \frac{1}{2}$ because $\frac{1}{4}$ of one circle is bigger than $\frac{1}{2}$ of the other circle. Is your friend correct? Explain.





Think and Grow: Modeling Real Life

Newton and Descartes have piggy banks that are the same size. Newton fills $\frac{3}{4}$ of his bank with pennies. Descartes fills $\frac{3}{6}$ of his bank with pennies. Whose bank is filled more?



Model:

Explain: _____ bank is filled more.

Show and Grow

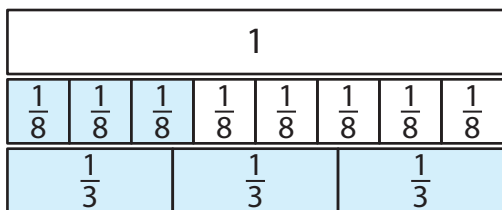
14. You use $\frac{1}{3}$ of a bottle of glitter for an art project. Your friend uses $\frac{1}{4}$ of a bottle for his art project. The bottles are the same size. Who uses more glitter?
-
15. A train and a plane are traveling the same distance from New York to Pittsburgh. The train completes $\frac{5}{8}$ of its journey. The plane completes $\frac{5}{6}$ of its journey. Which is farther away from Pittsburgh? Explain.
-
16. **DIG DEEPER!** You cut a piece of lasagna that is $\frac{1}{8}$ of a tray. Your friend cuts a piece of lasagna that is $\frac{1}{6}$ of a tray. Your piece is larger than your friend's piece. Explain how this is possible.

Learning Target: Compare fractions that have the same numerator.

Example Compare $\frac{3}{8}$ and $\frac{3}{3}$.

One Way: Use Fraction Strips.

Shade the Fraction Strips.
Compare the parts.



So, $\frac{3}{8}$ is **less than** $\frac{3}{3}$,

and $\frac{3}{8} < \frac{3}{3}$.

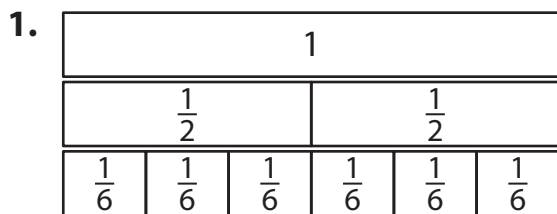
Another Way: When the numerators are the same, look at the denominators 8 and 3 to compare the sizes of the parts.

- The more parts the whole is divided into, the smaller the parts are.
- The fewer parts the whole is divided into, the larger the parts are.

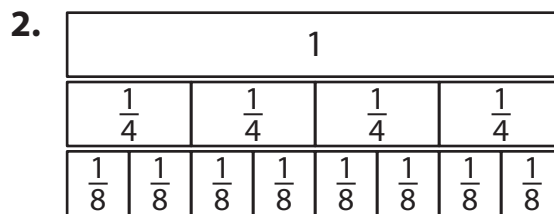
So, $\frac{1}{8}$ is **less than** $\frac{1}{3}$, and $\frac{3}{8} < \frac{3}{3}$.



Shade to compare the fractions.



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



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

Compare.

3. $\frac{1}{8} \bigcirc \frac{1}{4}$

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

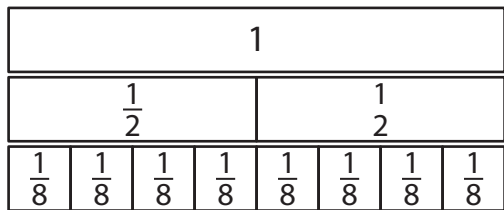
5. $\frac{2}{6} \bigcirc \frac{2}{3}$

6. $\frac{4}{8} \bigcirc \frac{4}{6}$

7. $\frac{2}{3} \bigcirc \frac{2}{4}$

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

9. Use the models to compare two fractions that have the same numerators.



$$\frac{\square}{\square} \bigcirc \frac{\square}{\square}$$

10. **YOU BE THE TEACHER** Newton says that if two fractions have the same numerator, then the fraction with the greater denominator is the greater fraction. Is Newton correct? Explain.

11. **Writing** How is comparing fractions with the same numerator similar to comparing fractions with the same denominator? How is it different?

12. **Modeling Real Life** You play a video game for $\frac{1}{2}$ of an hour. Your friend plays the video game for $\frac{1}{6}$ of an hour. Who plays the video game longer? Explain.

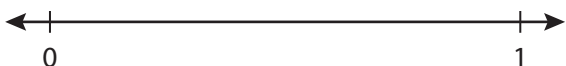


13. **Modeling Real Life** Two cars have the same-sized gasoline tank. Tank A is $\frac{4}{6}$ full. Tank B is $\frac{4}{8}$ full. Which tank is less full? Explain.

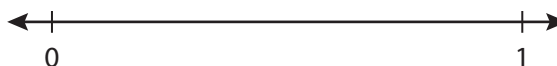
Review & Refresh

Plot the fraction on the number line.

14. $\frac{1}{4}$



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



Learning Target: Use a number line to compare fractions.

Success Criteria:

- I can plot fractions on a number line.
- I can tell which fraction is closer to 0.
- I can compare fractions on a number line.

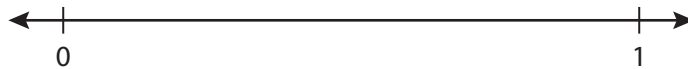


Explore and Grow

Use Fraction Strips to plot each fraction on the number line. Circle the greater fraction.

$$\frac{2}{8}$$

$$\frac{7}{8}$$



Construct Arguments Tell your partner how to use a number line to compare the fractions.

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

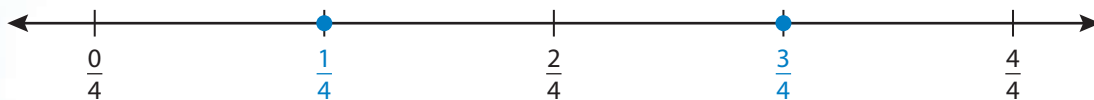


Think and Grow: Compare Fractions on a Number Line

On a number line, fractions to the left are less than fractions to the right. Fractions to the right are greater than fractions to the left.

Example Use a number line to compare $\frac{3}{4}$ and $\frac{1}{4}$.

Plot the fractions on a number line. Both have the same denominator.

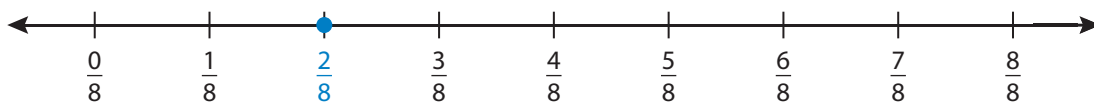


$\frac{3}{4}$ is to the _____ of $\frac{1}{4}$. So, $\frac{3}{4} \bigcirc \frac{1}{4}$.

Looking at the number line,
 $\frac{1}{4}$ is closer to $\frac{0}{4}$, or 0, and
 $\frac{3}{4}$ is closer to $\frac{4}{4}$, or 1.

Example Use number lines to compare $\frac{2}{8}$ and $\frac{2}{3}$.

Plot each fraction on a number line. Both fractions have the same numerator.



$\frac{2}{8}$ is to the _____ of $\frac{2}{3}$. So, $\frac{2}{8} \bigcirc \frac{2}{3}$.

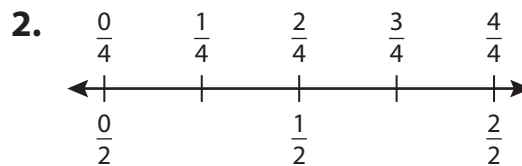


Show and Grow

Use the number line to compare the fractions.



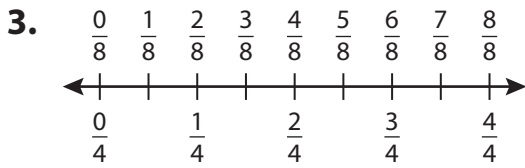
$$\frac{5}{6} \bigcirc \frac{4}{6}$$



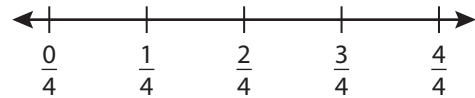
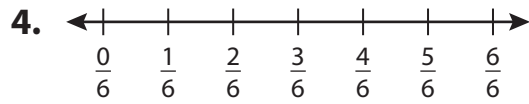
$$\frac{1}{2} \bigcirc \frac{2}{4}$$

Apply and Grow: Practice

Compare.



$$\frac{3}{4} \bigcirc \frac{6}{8}$$



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

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

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

7. $\frac{4}{8} \bigcirc \frac{1}{2}$

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

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

10. $\frac{1}{6} \bigcirc \frac{2}{6}$

11. Write a fraction that is greater than $\frac{5}{6}$.

12. Write a fraction that is less than $\frac{3}{4}$.

13. Newton buys $\frac{1}{4}$ pound of cheese. Descartes buys $\frac{3}{4}$ pound of cheese. Who buys more cheese?



14. **MP Number Sense** Which fractions are greater than $\frac{2}{4}$?

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



Think and Grow: Modeling Real Life

Does the recipe call for more salt or more pepper?

Models:

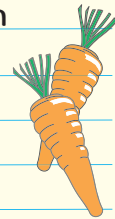


The recipe calls for more _____.

Explain:

Vegetable Soup

- 2 cups chicken broth
- $\frac{3}{2}$ cups tomato juice
- $\frac{1}{2}$ cup chopped celery
- $\frac{1}{2}$ cup chopped onion
- 1 cup diced tomatoes
- 1 cup water
- 1 cup diced potatoes
- $\frac{1}{4}$ cup corn kernels
- $\frac{2}{3}$ cup chopped green beans
- $\frac{3}{4}$ cup diced carrots
- $\frac{3}{8}$ teaspoon Creole seasoning
- $\frac{3}{4}$ teaspoon lemon juice
- $\frac{1}{2}$ teaspoon salt
- $\frac{1}{4}$ teaspoon pepper



Show and Grow

15. Does the recipe above call for more Creole seasoning or more lemon juice?

16. You and your friend each catch a fish. Your fish is $\frac{5}{3}$ feet long, and your friend's fish is $\frac{2}{3}$ foot long. Whose fish is shorter? Explain.

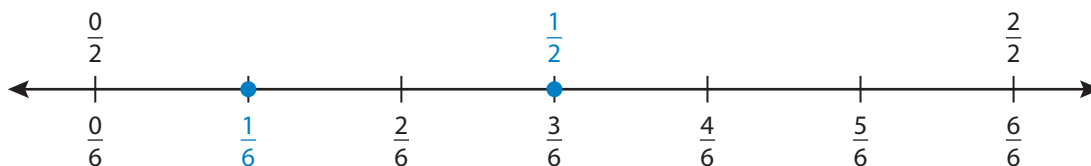


17. **DIG DEEPER!** You eat $\frac{4}{8}$ of a quesadilla. Your friend eats $\frac{2}{8}$ of a different quesadilla. Can you tell who ate more quesadilla? Explain.

Learning Target: Use a number line to compare fractions.

Example Use a number line to compare $\frac{1}{2}$ and $\frac{1}{6}$.

Plot the fractions on a number line. Both fractions have the same numerator.



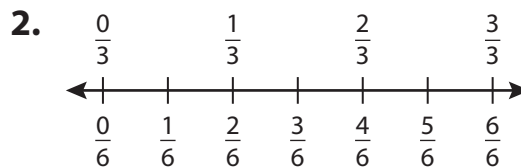
$\frac{1}{2}$ is to the **right** of $\frac{1}{6}$. So, $\frac{1}{2} > \frac{1}{6}$.



Use the number line to compare the fractions.



$$\frac{2}{8} \bigcirc \frac{5}{8}$$



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

Compare.

3. $\frac{1}{3} \bigcirc \frac{1}{4}$

4. $\frac{3}{6} \bigcirc \frac{4}{6}$

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

6. $\frac{1}{3} \bigcirc \frac{2}{6}$

7. $\frac{2}{4} \bigcirc \frac{2}{6}$

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

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

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

11. $\frac{3}{4} \bigcirc \frac{1}{4}$

12. Write a fraction that is greater than $\frac{1}{3}$.

13. Write a fraction that is less than $\frac{1}{2}$.

14. **Writing** Explain how to compare $\frac{2}{3}$ and $\frac{4}{3}$ on a number line.

15. **MP Number Sense** Which fractions are less than $\frac{4}{6}$?

$\frac{2}{3}$ $\frac{2}{6}$ $\frac{1}{6}$ $\frac{4}{4}$ $\frac{4}{8}$

Modeling Real Life Use the recipe shown.

16. Does the recipe call for more butter or more sugar? Explain.



Banana Bread

3 bananas

$\frac{1}{3}$ cup melted butter

$\frac{2}{3}$ cup sugar

1 egg

$\frac{3}{4}$ teaspoon vanilla

$\frac{1}{2}$ teaspoon baking soda

$\frac{3}{2}$ cups flour

$\frac{3}{4}$ cup nuts

17. Does the recipe call for less flour or less nuts? Explain.

Review & Refresh

Find the missing number.

18. $98 + \underline{\quad} = 98$

19. $52 + (\underline{\quad} + 16) = (52 + 28) + 16$

20. $33 + \underline{\quad} + 46 = 33 + 46$

21. $14 + 67 = 67 + \underline{\quad}$

Learning Target: Compare fractions.

Success Criteria:

- I can choose a strategy to compare two fractions.
- I can compare two fractions.



Explore and Grow

Use a strategy to find the greater fraction.

$$\frac{2}{3}$$

$$\frac{2}{8}$$

Use a different strategy to check your answer.



Construct Arguments Tell your partner which strategy you prefer. Explain.

Think and Grow: Compare Fractions

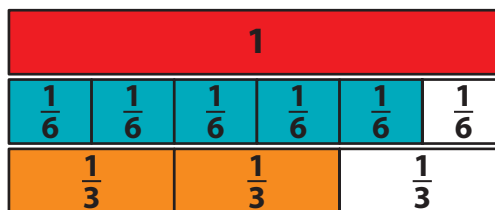
Example Compare $\frac{5}{6}$ and $\frac{2}{3}$.

Use Fraction Strips.

In some cases, it is easier to compare the parts that are missing. Notice that each fraction is 1 part away from being equivalent to 1. Compare the missing pieces.

Because $\frac{1}{6} \bigcirc \frac{1}{3}$, a larger piece is missing from $\frac{2}{3}$.

$$\text{So, } \frac{5}{6} \bigcirc \frac{2}{3}.$$



The fraction with the larger missing piece is the lesser fraction.



Example Compare $\frac{3}{8}$ and $\frac{5}{8}$.

The denominators are the same. Compare the numerators, 3 and 5.

$$\text{Because } 3 \bigcirc 5, \frac{3}{8} \bigcirc \frac{5}{8}.$$

Example Compare $\frac{4}{6}$ and $\frac{4}{8}$.

The numerators are the same. Look at the denominators 6 and 8 to compare the sizes of the parts. The fraction with the greater denominator is the lesser fraction.

$$\text{So, } \frac{4}{6} \bigcirc \frac{4}{8}.$$

Show and Grow

Compare.

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

2. $\frac{3}{4} \bigcirc \frac{5}{6}$

3. $\frac{0}{6} \bigcirc \frac{0}{2}$

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



Apply and Grow: Practice

Compare.

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

6. $\frac{3}{4} \bigcirc \frac{3}{6}$

7. $\frac{7}{8} \bigcirc \frac{3}{4}$

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

9. $\frac{1}{4} \bigcirc \frac{2}{8}$

10. $\frac{2}{4} \bigcirc \frac{2}{8}$

11. $\frac{1}{2} \bigcirc \frac{4}{8}$

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

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

Complete the statement.

14. $\frac{3}{6} < \frac{\square}{\square}$

15. $\frac{2}{8} > \frac{\square}{\square}$

16. $\frac{1}{4} < \frac{\square}{\square}$

17. Newton and Descartes have the same-sized lunch.

Newton eats $\frac{2}{3}$ of his lunch. Descartes eats $\frac{1}{2}$ of his lunch.

Who eats more of his lunch?



18. **DIG DEEPER!** Use the fractions and symbols to make two true statements.

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

$\square \bigcirc \square$ $\square \bigcirc \square$



Think and Grow: Modeling Real Life

Newton walks $\frac{3}{8}$ mile to school. Descartes walks $\frac{5}{6}$ mile to school.

Who walks farther to school?

Understand the problem:

Make a plan:

Solve:

_____ walks farther to school.



Show and Grow

19. Two apartment buildings have the same number of floors. New carpeting is installed on $\frac{2}{3}$ of the floors in Building A and $\frac{3}{6}$ of the floors in Building B. Which building has more floors with new carpeting?

20. Newton buys $\frac{5}{8}$ pound of peanuts and $\frac{1}{2}$ pound of cashews. Which weighs less? Explain.



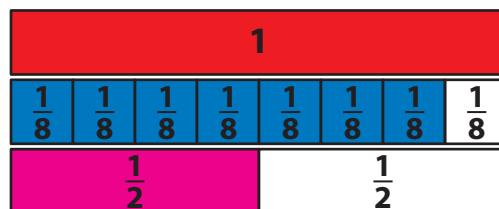
21. **DIG DEEPER!** You are painting a backdrop for a school play. You paint $\frac{1}{3}$ of the backdrop blue. You paint more of the backdrop yellow than blue. What fraction can represent the part of the backdrop that is yellow? Explain.

Learning Target: Compare fractions.**Example** Compare $\frac{7}{8}$ and $\frac{1}{2}$.

Use Fraction Strips.

Notice that each fraction is 1 part away from being equivalent to 1. Compare the missing pieces.

Because $\frac{1}{8} < \frac{1}{2}$, a larger piece is missing from $\frac{1}{2}$.



So, $\frac{7}{8} > \frac{1}{2}$.

Compare.

1. $\frac{2}{4} \bigcirc \frac{2}{6}$

2. $\frac{1}{2} \bigcirc \frac{3}{6}$

3. $\frac{1}{4} \bigcirc \frac{3}{4}$

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

5. $\frac{3}{4} \bigcirc \frac{6}{8}$

6. $\frac{1}{2} \bigcirc \frac{7}{8}$

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

8. $\frac{2}{3} \bigcirc \frac{3}{4}$

Complete the statement.

9. $\frac{5}{6} < \frac{\square}{\square}$

10. $\frac{7}{8} > \frac{\square}{\square}$

11. $\frac{2}{4} < \frac{\square}{\square}$

12. **MP Number Sense** Which statements are true?

$$\frac{3}{8} \stackrel{?}{<} \frac{3}{4}$$

$$\frac{2}{3} \stackrel{?}{>} \frac{7}{8}$$

$$\frac{3}{4} \stackrel{?}{<} \frac{1}{4}$$

$$\frac{1}{2} \stackrel{?}{>} \frac{1}{4}$$

13. **Writing** Explain how to compare $\frac{2}{3}$ and $\frac{7}{8}$ using missing pieces.

14. **Modeling Real Life** Newton and Descartes each have a phone with the same amount of storage. Newton's storage is $\frac{3}{4}$ full. Descartes's storage is $\frac{2}{8}$ full. Whose phone has more storage left?



15. **DIG DEEPER!** A restaurant wants to serve two different-sized hamburgers. The larger hamburger will be $\frac{1}{2}$ pound. Name a fraction that could represent the other hamburger's size.

Review & Refresh

16. There are 37 students on a bus. The bus stops 5 times. Seven students get off at each stop. How many students are left on the bus?

Learning Target: Compare and order fractions.

Success Criteria:

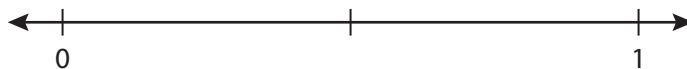
- I can choose a strategy to compare three fractions.
- I can order three fractions from least to greatest.
- I can order three fractions from greatest to least.



Explore and Grow

Plot the fractions on the number line. Order the fractions from least to greatest.

$$\frac{3}{6} \quad \frac{1}{6} \quad \frac{5}{6}$$



Least

Greatest

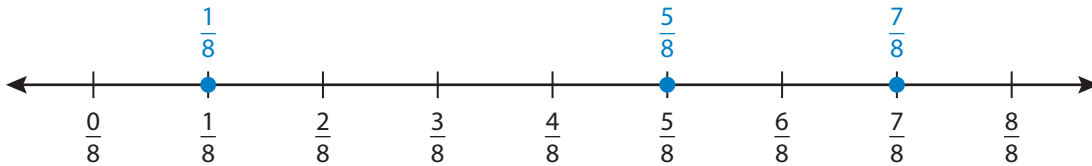


Reasoning How can you use the fraction $\frac{1}{2}$ to compare and order fractions?

Think and Grow: Compare and Order Fractions

Example Order the fractions $\frac{7}{8}$, $\frac{1}{8}$, and $\frac{5}{8}$ from least to greatest.

Plot the fractions on the number line. All 3 fractions have the same denominator, 8.



$\frac{\quad}{8}$ is farthest to the left. $\frac{\quad}{8}$ is farthest to the right.

$\frac{\quad}{8}$ is between the other two fractions.

So, the order from least to greatest is $\frac{\square}{\square}$, $\frac{\square}{\square}$, $\frac{\square}{\square}$.

Think: $\frac{7}{8}$ is close to 1. $\frac{1}{8}$ is close to 0. $\frac{5}{8}$ is close to $\frac{4}{8}$, or $\frac{1}{2}$.



Example Order the fractions $\frac{2}{4}$, $\frac{2}{3}$, and $\frac{2}{6}$ from least to greatest.

Use Fraction Strips. All three fractions have the same numerator, 2.

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

Shade the Fraction Strips. Compare the parts.

$\frac{2}{4}$ is the shortest. $\frac{2}{6}$ is the longest.

$\frac{2}{3}$ is between the other two fractions.

So, the order from least to greatest is $\frac{\square}{\square}$, $\frac{\square}{\square}$, $\frac{\square}{\square}$.

Show and Grow

1. Order the fractions $\frac{3}{3}$, $\frac{3}{4}$, and $\frac{3}{8}$ from least to greatest.

$\frac{\square}{\square}$, $\frac{\square}{\square}$, $\frac{\square}{\square}$



Apply and Grow: Practice

Order the fractions from least to greatest.

2. $\frac{1}{6}, \frac{6}{6}, \frac{5}{6}$

□	□	□
□	□	□

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

□	□	□
□	□	□

4. $\frac{4}{4}, \frac{0}{4}, \frac{3}{4}$

□	□	□
□	□	□

5. $\frac{6}{1}, \frac{6}{6}, \frac{6}{8}$

□	□	□
□	□	□

Order the fractions from greatest to least.

6. $\frac{4}{8}, \frac{3}{8}, \frac{6}{8}$

□	□	□
□	□	□

7. $\frac{2}{4}, \frac{2}{1}, \frac{2}{6}$

□	□	□
□	□	□

8. **MP Reasoning** Three fractions have the same denominator. How do you know which fraction is the greatest?

9. **Open-Ended** Write a fraction that is between $\frac{2}{8}$ and $\frac{2}{3}$.

10. **MP Patterns** The fractions below are in order from least to greatest. Describe and complete the pattern.

$\frac{2}{8}, \frac{2}{7}, \frac{2}{6}, \frac{2}{5}, \frac{2}{\square}, \frac{2}{\square}, \frac{2}{\square}, \frac{2}{\square}$



Think and Grow: Modeling Real Life

A construction crew replaces $\frac{1}{8}$ mile of a road on Monday, $\frac{1}{4}$ mile of the road on Tuesday, and $\frac{1}{6}$ mile of the road on Wednesday. On which day does the crew replace the longest piece of the road? On which day does the crew replace the shortest piece? Explain.



Model:

The crew replaces the longest piece of the road on _____
and the shortest piece on _____.

Explain:

Show and Grow

11. You place three plants in order from shortest to tallest. A cactus is $\frac{4}{6}$ foot tall, a fern is $\frac{4}{4}$ foot tall, and an aloe vera plant is $\frac{4}{8}$ foot tall. Which plant is first? Which plant is last? Explain.



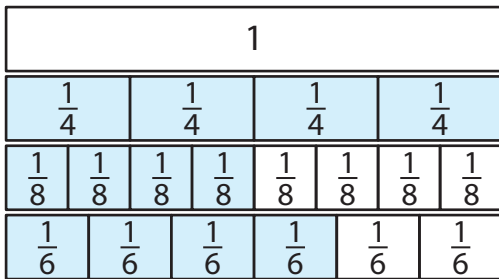
12. You measure the lengths of three spiders. The longest one is $\frac{3}{4}$ inch long. The shortest one is $\frac{1}{4}$ inch long. What is a possible length for the third spider? Explain.

13. **DIG DEEPER!** You are ordering three fractions. You know which fraction is the greatest and which fraction is the least. What do you know about the third fraction?

Learning Target: Compare and order fractions.

Example Order the fractions $\frac{4}{4}$, $\frac{4}{8}$, and $\frac{4}{6}$ from least to greatest.

Use Fraction Strips. All three fractions have the same numerator, 4. Shade the fraction strips. Compare the parts.



$\frac{4}{8}$ is the shortest. $\frac{4}{4}$ is the longest.
8 4

$\frac{4}{6}$ is between the other two fractions.
6

So, the order from least to greatest is $\frac{\text{4}}{\text{8}}$, $\frac{\text{4}}{\text{6}}$, $\frac{\text{4}}{\text{4}}$.

Order the fractions from least to greatest.

<p>1. $\frac{8}{4}, \frac{8}{1}, \frac{8}{3}$ </p>	<p>2. $\frac{2}{4}, \frac{1}{4}, \frac{3}{4}$ </p>
<p>3. $\frac{16}{8}, \frac{3}{8}, \frac{5}{8}$ </p>	<p>4. $\frac{4}{2}, \frac{4}{8}, \frac{4}{6}$ </p>

Order the fractions from greatest to least.

<p>5. $\frac{1}{6}, \frac{1}{4}, \frac{1}{8}$ </p>	<p>6. $\frac{0}{2}, \frac{2}{2}, \frac{1}{2}$ </p>
<p>7. $\frac{3}{3}, \frac{1}{3}, \frac{2}{3}$ </p>	<p>8. $\frac{6}{3}, \frac{6}{8}, \frac{6}{2}$ </p>

9. **MP Reasoning** Three fractions have the same numerator. How do you know which fraction is the greatest?

10. **MP Precision** Which set of fractions is ordered from least to greatest?

$$\frac{2}{1}, \frac{2}{6}, \frac{2}{10}$$

$$\frac{1}{4}, \frac{3}{4}, \frac{2}{4}$$

$$\frac{5}{6}, \frac{4}{6}, \frac{0}{6}$$

$$\frac{5}{6}, \frac{5}{5}, \frac{5}{3}$$

11. **Modeling Real Life** You survey your classmates about their favorite subject. $\frac{5}{8}$ of the students choose math, $\frac{1}{8}$ choose reading, and $\frac{2}{8}$ choose science. Which subject receives the most votes? Which subject receives the least votes? Explain.

12. **Modeling Real Life** A carpenter has three drill bits. The thickest one is $\frac{3}{4}$ inch. The thinnest one is $\frac{3}{8}$ inch. What is a possible width for the third drill bit? Explain.



Review & Refresh

13. You clean lunch tables. There are 6 rows of tables with 7 tables in each row. How many tables do you clean?

1. You invite five friends to dinner. You start making chili using the recipe shown at 4:00.
- a. What time should you tell your friends the chili will be ready?

.....

- b. Which ingredient do you use the same amount of as crushed garlic?

.....

- c. Do you use more chopped green pepper or onion?

.....

- d. How many ounces of beans do you use in all?

.....

- e. You know there is $\frac{1}{4}$ cup of diced tomatoes in each serving. How many cups of diced tomatoes do you need?

.....



- f. You and your friends each eat 2 servings of chili. How many servings are left? Write an equation to solve. Use letters to represent unknown numbers.

Vegetarian Chili

Number of Servings: 16

2 cups water

$\frac{1}{8}$ cup olive oil

$\frac{2}{8}$ cup crushed garlic

2 cups carrots

_____ cups diced tomatoes

$\frac{1}{2}$ cup onion

$\frac{3}{4}$ cup chopped green pepper

$\frac{1}{4}$ cup chili powder

2 8-ounce cans pinto beans

2 8-ounce cans black beans

Salt and pepper to taste

Prep time: 20 minutes

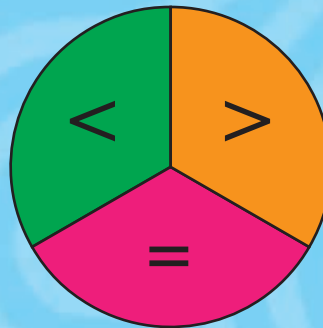
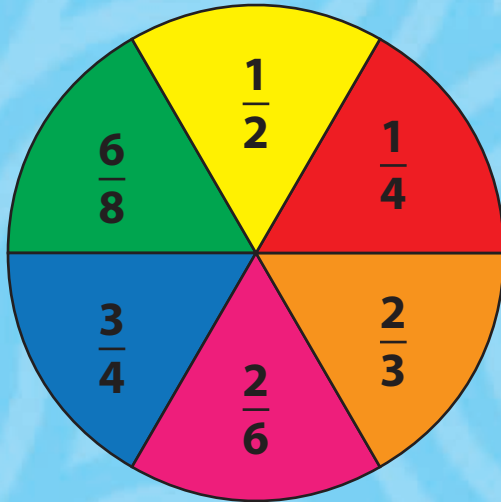
Cook time: 40 minutes



Fraction Spin and Compare

Directions:

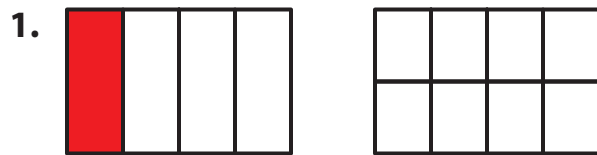
1. Players take turns.
2. On your turn, spin both spinners. Cover a box that makes the statement true.
3. If there are no fractions left that make the statement true, then you lose your turn.
4. Play until all boxes are covered.
5. The player with the most boxes covered wins!



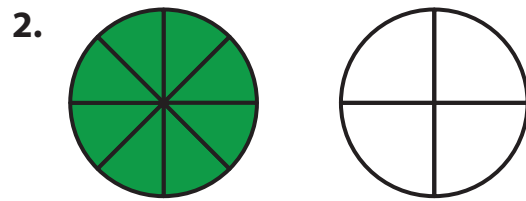
$\frac{1}{3}$	$\frac{6}{8}$	$\frac{3}{3}$	$\frac{4}{6}$
$\frac{2}{4}$	$\frac{1}{6}$	$\frac{4}{4}$	$\frac{2}{2}$
$\frac{7}{8}$	$\frac{3}{6}$	$\frac{3}{4}$	$\frac{2}{8}$

11.1 Equivalent Fractions

Use the models to find an equivalent fraction. Both models show the same whole.

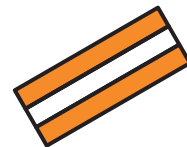
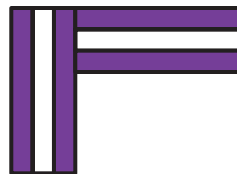


$$\frac{1}{4} = \frac{\square}{8}$$



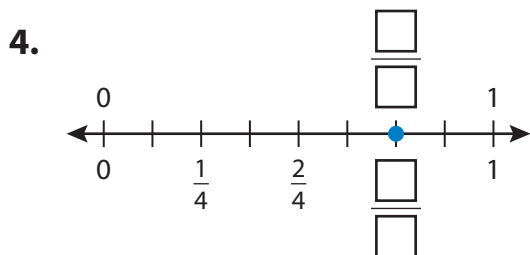
$$\frac{8}{8} = \frac{\square}{4}$$

3. **Which One Doesn't Belong?** Which one does *not* belong with the other three?

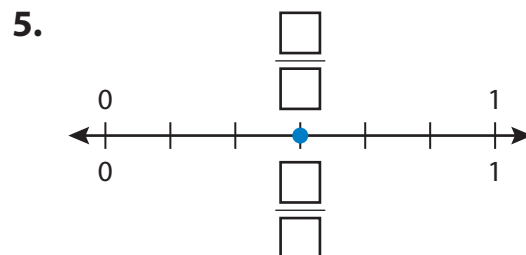


11.2 Equivalent Fractions on a Number Line

Write two fractions that name the point shown.



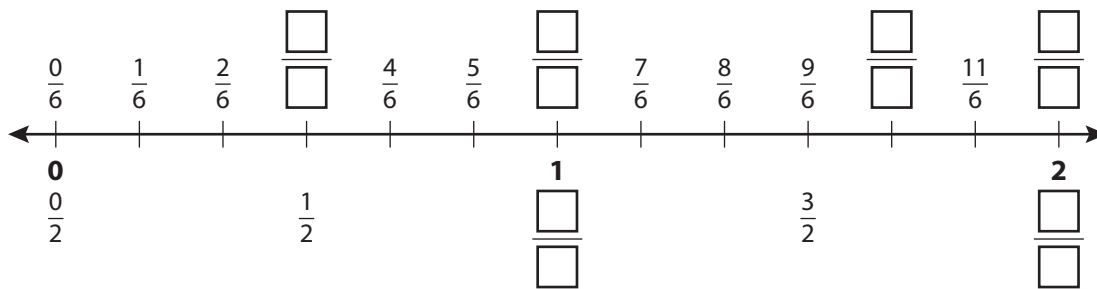
$$\frac{\square}{\square} = \frac{\square}{\square}$$



$$\frac{\square}{\square} = \frac{\square}{\square}$$

11.3 Relate Fractions and Whole Numbers

6. Complete the number line. Then write equivalent fractions for the numbers 1 and 2.



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

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

Write two equivalent fractions for the whole number.

7. $2 = \frac{\square}{4} = \frac{\square}{6}$

8. $6 = \frac{\square}{3} = \frac{\square}{4}$

9. $4 = \frac{\square}{2} = \frac{\square}{8}$

Write the equivalent whole number.

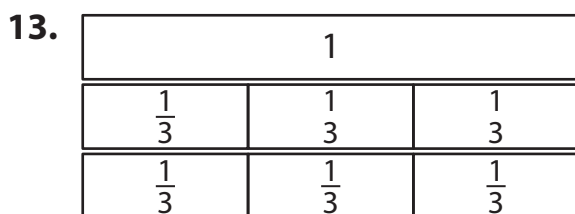
10. $\frac{4}{4} = \frac{1}{1} = \square$

11. $\frac{24}{8} = \frac{12}{4} = \square$

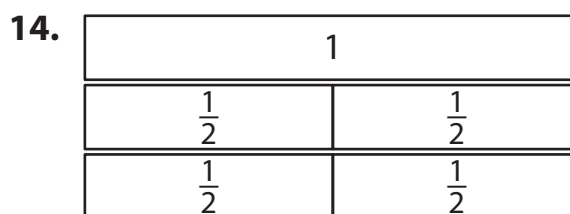
12. $\frac{24}{6} = \frac{16}{4} = \square$

11.4 Compare Fractions with the Same Denominator

Shade to compare the fractions.



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



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

Compare.

15. $\frac{2}{4} \bigcirc \frac{3}{4}$

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

17. $\frac{1}{6} \bigcirc \frac{5}{6}$

11.5

Compare Fractions with the Same Numerator

Compare.

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

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

20. $\frac{2}{3} \bigcirc \frac{2}{4}$

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

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

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

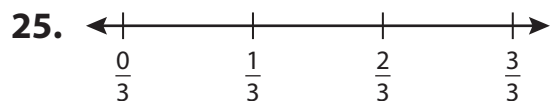
24. **Modeling Real Life** Your glass of orange juice is $\frac{1}{2}$ full. Your friend's glass of orange juice is $\frac{1}{3}$ full. Your friend has more orange juice. Explain how this is possible.



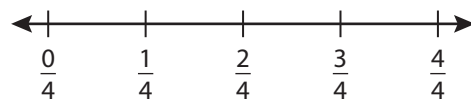
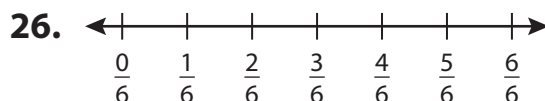
11.6

Compare Fractions on a Number Line

Compare.



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



$\frac{2}{6} \bigcirc \frac{2}{4}$

27. $\frac{4}{8} \bigcirc \frac{4}{6}$

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

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

30. Write a fraction that is greater than $\frac{1}{8}$.

31. Write a fraction that is less than $\frac{2}{3}$.

11.7 Compare Fractions

Compare.

$$32. \frac{1}{1} \bigcirc \frac{1}{2}$$

$$33. \frac{3}{6} \bigcirc \frac{5}{6}$$

$$34. \frac{4}{6} \bigcirc \frac{4}{8}$$

$$35. \frac{1}{3} \bigcirc \frac{2}{3}$$

$$36. \frac{2}{2} \bigcirc \frac{2}{8}$$

$$37. \frac{3}{4} \bigcirc \frac{7}{8}$$

38. **MP Number Sense** Which statements are true?

$$\frac{2}{3} \stackrel{?}{<} \frac{7}{8}$$

$$\frac{1}{8} \stackrel{?}{<} \frac{1}{4}$$

$$\frac{5}{6} \stackrel{?}{>} \frac{3}{4}$$

$$\frac{1}{2} \stackrel{?}{>} \frac{0}{2}$$

11.8 Compare and Order Fractions

Order the fractions from least to greatest.

$$39. \frac{4}{4}, \frac{4}{8}, \frac{4}{6}$$

□	□	□
□	□	□

$$40. \frac{3}{6}, \frac{5}{6}, \frac{1}{6}$$

□	□	□
□	□	□

Order the fractions from greatest to least.

$$41. \frac{1}{3}, \frac{0}{3}, \frac{2}{3}$$

□	□	□
□	□	□

$$42. \frac{2}{6}, \frac{2}{1}, \frac{2}{4}$$

□	□	□
□	□	□

43. **Modeling Real Life** You, your friend, and your cousin have the same-sized aquarium. You fill your aquarium $\frac{2}{3}$ full, your friend fills hers $\frac{2}{6}$ full, and your cousin fills his $\frac{2}{4}$ full. Which aquarium is the least full? Which aquarium is the most full? Explain.

