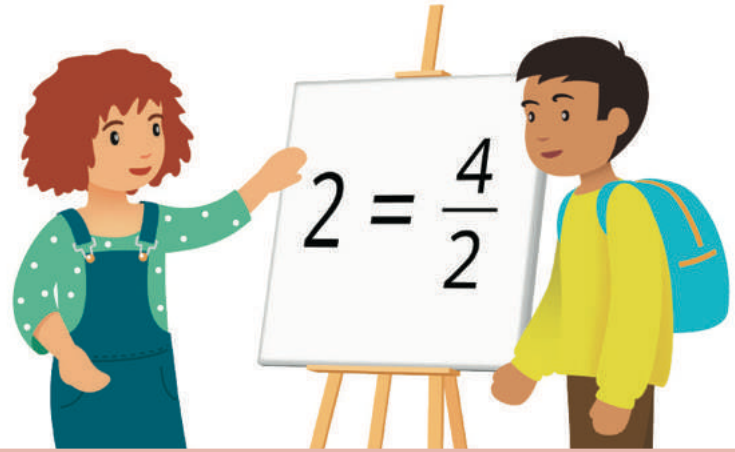




Fractions as Numbers



Student Workbook



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Fractions as Numbers

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Fractions as Numbers
Student Workbook
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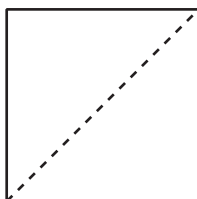
Lesson 1: Name the Parts

- Let's name parts of a whole.

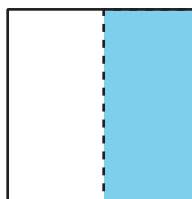
Warm-up: Which One Doesn't Belong: Shapes with Parts

Which one doesn't belong?

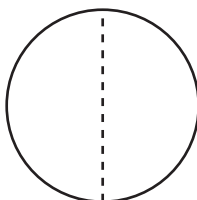
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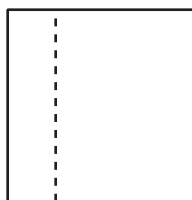
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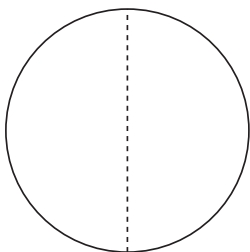


1.1: Card Sort: Partitions

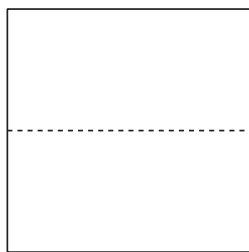
Your teacher will give you a set of cards that show some shapes that are partitioned.

Sort the cards into 2 categories of your choosing. Be prepared to explain the meaning of your categories.

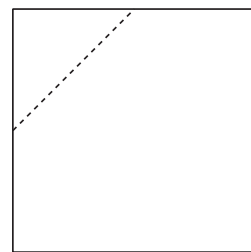
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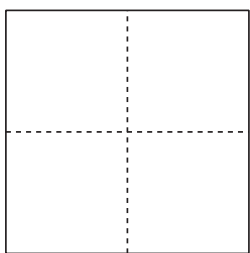
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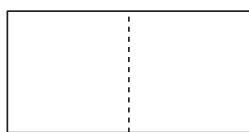
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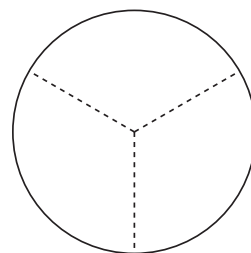
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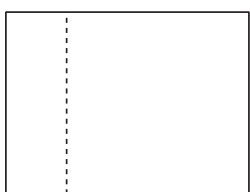
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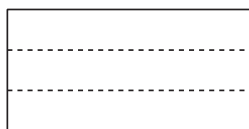
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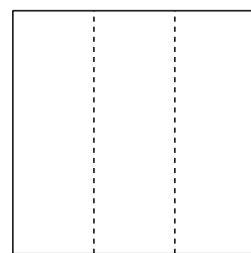
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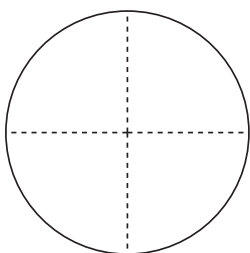
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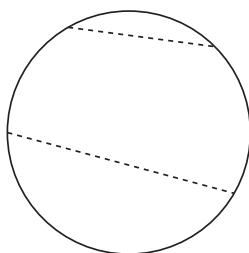
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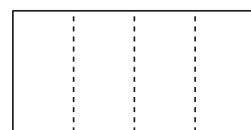
D



H



L



1.2: Fold and Name

Fold each rectangle your teacher gives you into 3, 6, 4, or 8 equal parts. Draw lines where you folded to partition the rectangles. Be prepared to share how you folded your shapes.

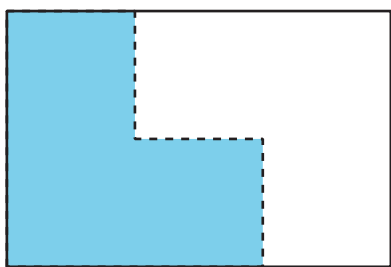
Lesson 2: Name Parts as Fractions

- Let's use fractions to describe parts.

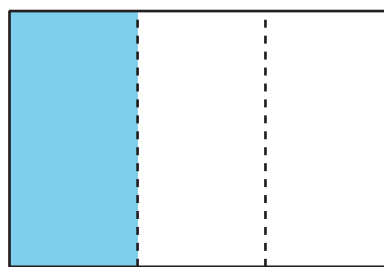
Warm-up: Which One Doesn't Belong: Shaded Parts

Which one doesn't belong?

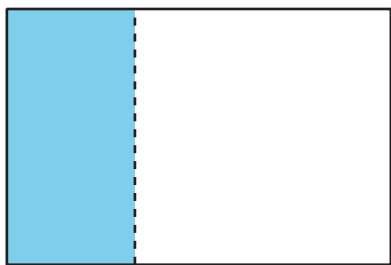
A



B



C



D



2.1: Partition the Strips

Your teacher will give you some paper strips. Each strip represents 1.

Fold each strip so that the parts represent one of the following fractions. Use one strip for each fraction.

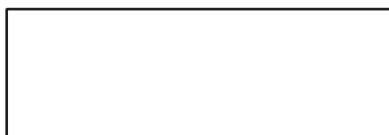
- halves
- fourths
- eighths
- thirds
- sixths

When you finish folding, trace your folding lines with a pencil and then label each part with the correct fraction.

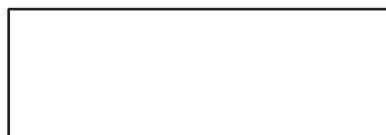
2.2: Partition, Shade, Trade

1. Partition each rectangle into halves, thirds, fourths, sixths, and eighths. Then label each part with the correct fraction.

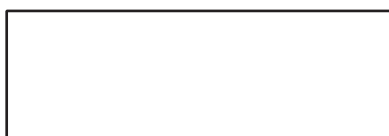
halves



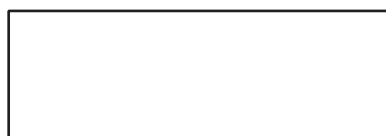
sixths



thirds



eighths



fourths



2. a. Partition the rectangle into equal-sized parts. Shade one of the parts.



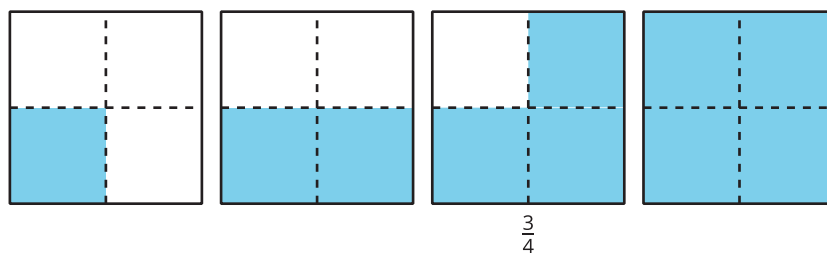
- b. Trade rectangles with a partner. If the whole rectangle is 1, what number represents the shaded part? Explain your reasoning.

Lesson 3: Non-unit Fractions

- Let's learn about non-unit fractions.

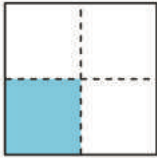
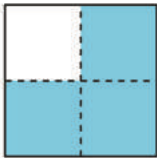
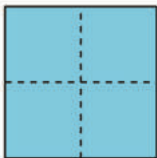

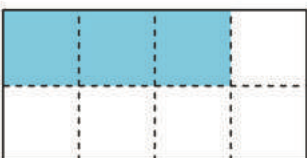
Warm-up: Notice and Wonder: More than One Part

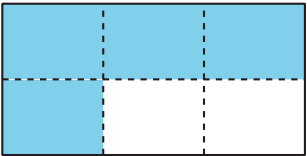
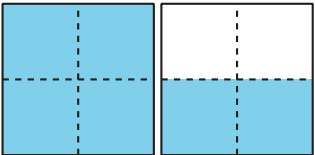
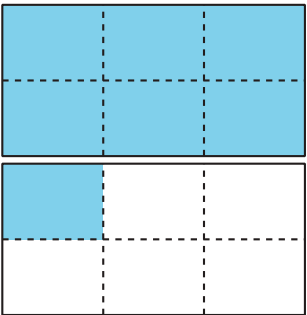
What do you notice? What do you wonder?



3.1: Write and Read Fractions

Each shape in each row of the table represents 1. Use the shaded parts to complete the missing information in the table. Be prepared to explain your reasoning.

	number of shaded parts	size of each part	word name for the shaded parts	number name for the shaded parts
	1	$\frac{1}{4}$	one-fourth	$\frac{1}{4}$
				$\frac{3}{4}$
				
				
				

	number of shaded parts	size of each part	word name for the shaded parts	number name for the shaded parts
				
				
				

3.2: Fraction Match

Your teacher will give you a set of cards for playing Fraction Match. Two cards are a match if one is a diagram and the other a number, but they have the same value.

1. To play Fraction Match:
 - Arrange the cards face down in an array.
 - Take turns choosing 2 cards. If the cards match, keep them and go again. If not, return them to where they were, face down. You can't keep more than 2 matches on each turn.
 - After all the matches have been found, the player with the most cards wins.
2. Use the cards your teacher gives you to create 4 new pairs of cards to add to the set.
3. Play another round of Fraction Match using all the cards.

Lesson 4: Build Fractions from Unit Fractions

- Let's build other fractions from unit fractions.

Warm-up: Number Talk: 3 and Another Factor

Find the value of each expression mentally.

- 3×3

- 7×3

- 10×3

- 3×17

4.1: Introduce Secret Fractions

The goal of the game is to be the first to build 2 secret fractions with unit fractions.

1. Make two stacks: one for secret fractions and one for unit fractions. Place all cards face down.
2. Each player draws 2 secret fraction cards. These are the fractions you are trying to make with your unit fractions.
3. On your turn, you can make one of these moves:
 - Pick up 1 unit fraction card.
 - Trade both of your secret fractions for 2 new secret fractions from the stack.
4. When you have enough unit fractions to make one of your secret fractions, shade your gameboard to represent your secret fraction. Then, pick a new secret fraction.
5. The first player to make 2 secret fractions wins.

Gameboard

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

4.2: Represent Fraction Situations

Here are four situations about playing Pilolo and four diagrams. Each diagram represents the length of a street where the game is played.

Represent each situation on a diagram. Be prepared to explain your reasoning.



1. A student walks $\frac{4}{8}$ the length of the street and hides a rock.



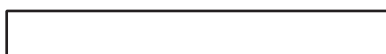
2. A student walks $\frac{2}{3}$ the length of the street and hides a penny.



3. A student walks $\frac{3}{4}$ the length of the street and hides a stick.



4. A student walks $\frac{5}{6}$ the length of the street and hides a penny.



5. This diagram represents the location of a hidden stick.

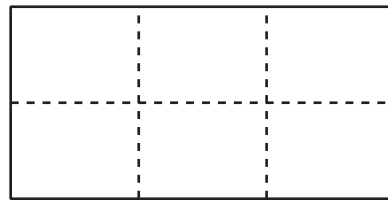
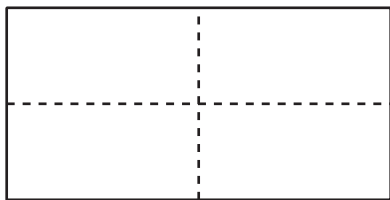


About what fraction of the length of the street did the student walk to hide it? Be prepared to explain how you know.

Section Summary

Section Summary

In this section, we learned how to partition shapes into halves, thirds, fourths, sixths, and eighths, and how to describe each of those parts in words and using a number.



The numbers we use to describe these equal-sized parts are **fractions**.

A fraction like $\frac{1}{4}$ is read “one-fourth” because it represents one of the 4 equal parts in a whole.



A fraction like $\frac{3}{4}$ is read “three-fourths” because it represents 3 parts that are each one-fourth or $\frac{1}{4}$ in size.



Fractions that refer to only one of the equal parts in a whole— like $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{8}$ —are called **unit fractions**.

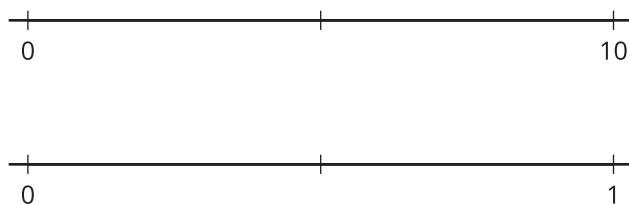
We learned that the bottom part of the fraction tells us how many equal parts we partitioned the whole into. The top part of the fraction tells us how many of the equal parts are being described.

Lesson 5: To the Number Line

- Let's learn about fractions on the number line.

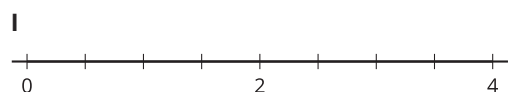
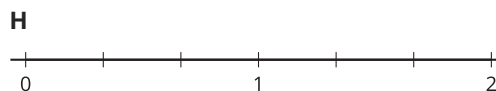
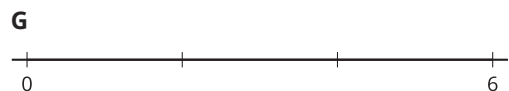
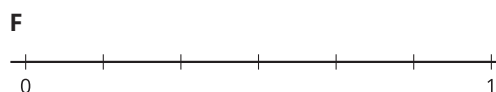
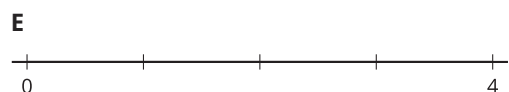
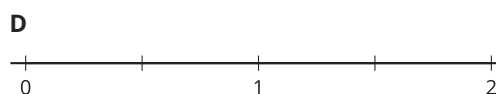
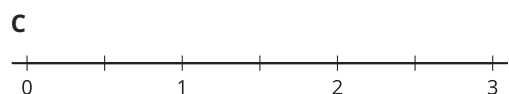
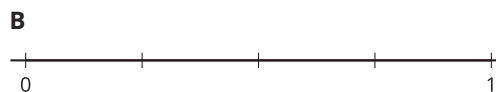
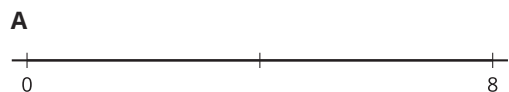
Warm-up: Notice and Wonder: Two Number Lines

What do you notice? What do you wonder?



5.1: Card Sort: Number Lines

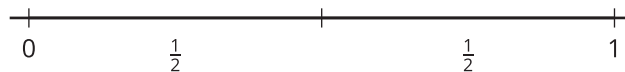
Your teacher will give you a set of cards that show number lines. Sort the cards into categories of your choosing. Be prepared to explain the meaning of your categories.



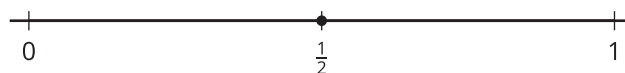
5.2: Fold and Label the Number Line

1. Andre and Clare are talking about how to label fractions on the number line.

Andre says $\frac{1}{2}$ can be labeled like this:



Clare says $\frac{1}{2}$ can be labeled like this:



How could each student's labeling make sense?

2. Your teacher will give you a set of number lines. Cut your number lines apart so that you can fold each one.

As you fold, discuss your strategies with your partner.

- a. Fold one of the number lines into halves. Draw tick marks to show the halves. Label the number $\frac{1}{2}$.
- b. Fold one of the number lines into thirds. Draw tick marks to show the thirds. Label the number $\frac{1}{3}$.
- c. Fold one of the number lines into fourths. Draw tick marks to show the fourths. Label the number $\frac{1}{4}$.
- d. Fold one of the number lines into sixths. Draw tick marks to show the sixths. Label the number $\frac{1}{6}$.
- e. Fold one of the number lines into eighths. Draw tick marks to show the eighths. Label the number $\frac{1}{8}$.

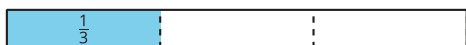
Lesson 6: Locate Unit Fractions on the Number Line

- Let's partition the number line to locate unit fractions.

Warm-up: Which One Doesn't Belong: Fraction Details

Which one doesn't belong?

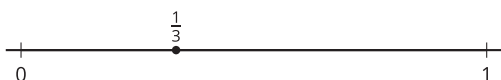
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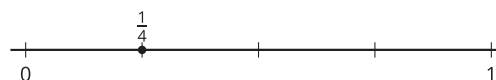
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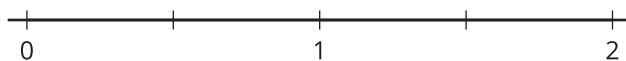
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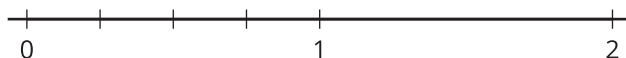
6.1: Partition Fourths

Three students are partitioning a number line into fourths. Their work is shown.

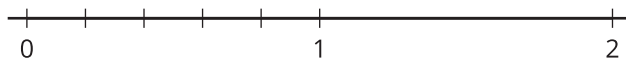
Clare's number line:



Andre's number line:



Diego's number line:

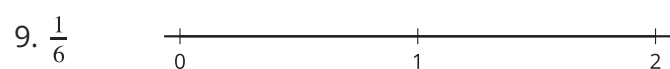
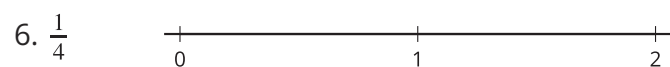
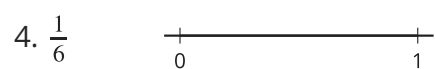
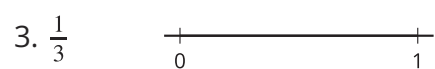
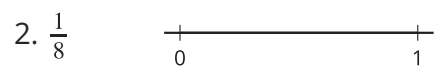
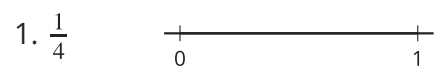


Whose partitioning makes the most sense to you? Explain your reasoning.



6.2: Unit Fractions on the Number Line

Partition each number line. Locate and label each fraction.

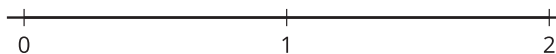


Lesson 7: Non-unit Fractions on the Number Line

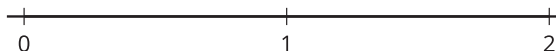
- Let's locate non-unit fractions on the number line.

7.2: Fractions on the Number Line

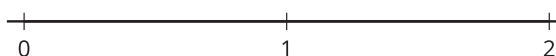
1. Locate and label $\frac{3}{4}$ and $\frac{6}{4}$.



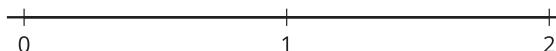
2. Locate and label $\frac{7}{8}$ and $\frac{12}{8}$.



3. Locate and label $\frac{2}{3}$ and $\frac{4}{3}$.



4. Locate and label $\frac{2}{6}$ and $\frac{7}{6}$.

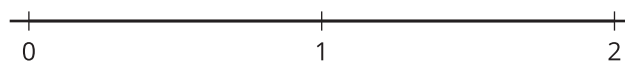


5. How did you partition the number line when you were locating the numbers $\frac{7}{8}$ and $\frac{12}{8}$? Explain your reasoning.

6. What patterns did you notice in the fractions you located?

7.3: What's the Fraction?

1. Partition the number line into any number of equal-size parts. Locate and mark, but don't label, a fraction of your choice.

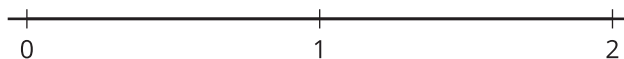
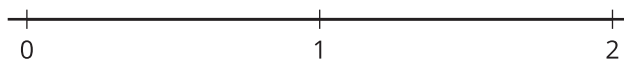


2. Trade number lines with a partner.

- a. How did your partner partition their number line?

- b. What number did your partner mark on their number line? Explain your reasoning.

If you have time, play the game again.



Lesson 8: Fractions and Whole Numbers

- Let's work with fractions and whole numbers on the number line.

Warm-up: Number Talk: Divide by 4

Find the value of each expression mentally.

- $12 \div 4$

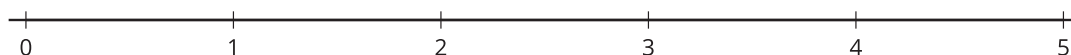
- $24 \div 4$

- $60 \div 4$

- $72 \div 4$

8.1: Fractions Located at Whole Numbers

1. Locate and label your assigned fractions on the number line. Be prepared to explain your reasoning.



a. $\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}, \frac{6}{2}, \frac{7}{2}, \frac{8}{2}, \frac{9}{2}, \frac{10}{2}$

b. $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{5}{3}, \frac{6}{3}, \frac{7}{3}, \frac{8}{3}, \frac{9}{3}$

c. $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}, \frac{9}{4}, \frac{10}{4}, \frac{11}{4}, \frac{12}{4}$

2. List all the fractions that were located at a whole number in all three number lines that your group labeled.

3. What patterns do you see in all three labeled number lines?



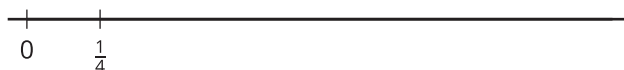
8.2: Locate 1 on the Number Line

1. Locate and label 1 on each number line. Be prepared to explain your reasoning.

a.



b.



c.



d.



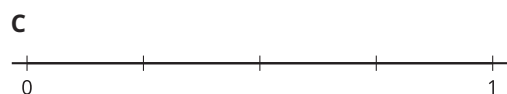
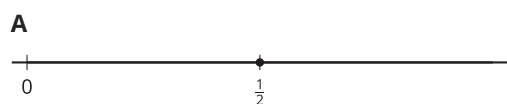
2. How could you locate 2 on the number lines in the previous problem?

Lesson 9: All Kinds of Numbers on the Number Line

- Let's locate numbers on the number line when we are given the location of one fraction.

Warm-up: Which One Doesn't Belong: Many Number Lines

Which one doesn't belong?



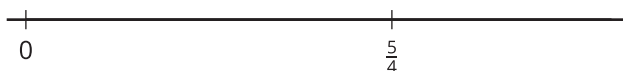
9.1: Locate 1 Again

1. Locate and label 1 on each number line.

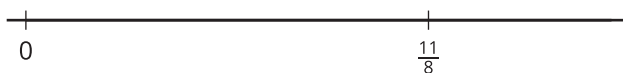
a.



b.



c.

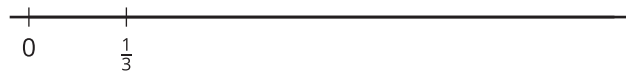


2. Use any of the number lines to explain how you located 1.



9.2: Locate $\frac{3}{4}$

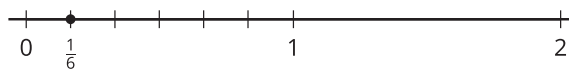
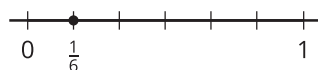
Locate and label $\frac{3}{4}$ on the number line. Be prepared to explain your reasoning.



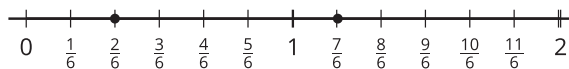
Section Summary

Section Summary

In this section, we located and labeled fractions on the number line. We learned how to partition the number line from 0 to 1 to locate unit fractions.



Then we used the location of unit fractions to locate other fractions.



We also learned that some fractions are at the same location as whole numbers on the number line. Here, we can see that $\frac{6}{6}$ shares the same location as 1 and $\frac{12}{6}$ shares the same location as 2.

At the end of the section, we used our understanding of unit fractions to locate 1 on the number line when we only knew the location of a fraction.

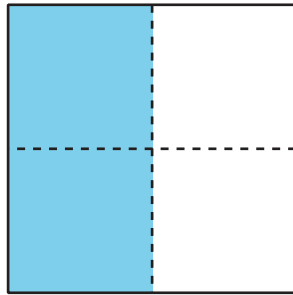
Lesson 10: Equivalent Fractions

- Let's identify equivalent fractions.

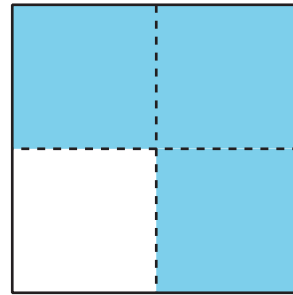
10.1: Equivalent to $\frac{1}{2}$

1. For which shapes is the shaded portion $\frac{1}{2}$ of the shape? Be prepared to share your reasoning.

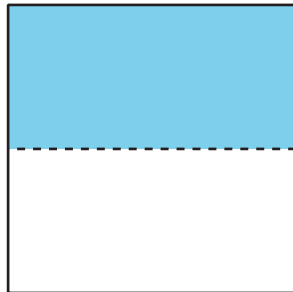
A



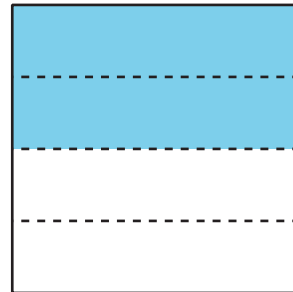
B



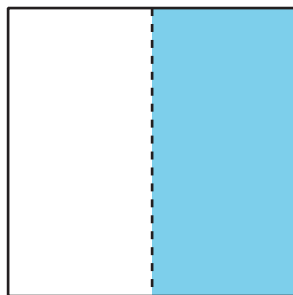
C



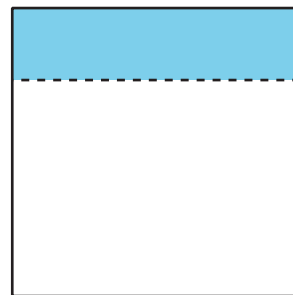
D



E



F



2. How can there be more than one way of shading a shape to show $\frac{1}{2}$?

10.2: Find Equivalent Fractions

Use your fraction strips from an earlier lesson to find as many equivalent fractions as you can that are equivalent to:

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

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

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

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

Be prepared to show how you know the fractions are equivalent.

Lesson 11: Generate Equivalent Fractions

- Let's generate equivalent fractions.

Warm-up: Number Talk: Something Times 8

Find the value of each expression mentally.

- 2×8

- 6×8

- 10×8

- 12×8

11.1: Show Equivalence

1. The diagram represents 1.



a. What fraction does the shaded part of the diagram represent?

b. Jada says it represents $\frac{4}{8}$. Tyler is not so sure.

Do you agree with Jada? If so, explain or show how you would convince Tyler that Jada is correct. If not, explain or show your reasoning.

2. Each diagram represents 1.

a. Show that the shaded part of this diagram represents both $\frac{1}{3}$ and $\frac{2}{6}$.



b. Show that the shaded part represents both $\frac{6}{8}$ and $\frac{3}{4}$.



c. Show that the shaded part represents both $\frac{6}{6}$ and $\frac{2}{2}$.



11.2: More Than One Name

1. Each diagram represents 1. Write two fractions to represent the shaded part of each diagram.

a.



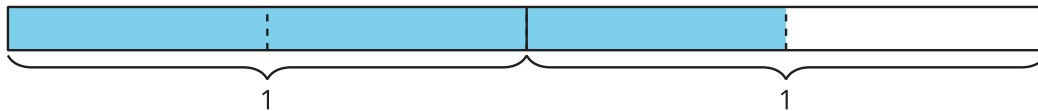
b.



c.



2. Here's another diagram.



a. What fraction does the shaded part of the diagram represent?

b. Write another fraction that it represents.

Lesson 12: Equivalent Fractions on a Number Line

- Let's find fractions at the same location.

Warm-up: Notice and Wonder: Running on a Trail

What do you notice? What do you wonder?

Tyler ran part of the length of a trail.
Han ran part of the length of the same trail.

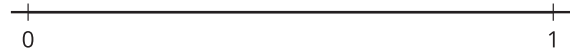


12.1: Running Part of a Trail

Some students are running on a trail at a park. Decide if each pair of students ran the same distance.

You can use number lines if they are helpful to you.

1. Elena ran $\frac{3}{6}$ of the trail.



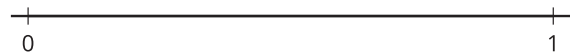
Han ran $\frac{1}{2}$ of the trail.



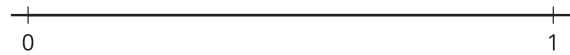
2. Jada ran $\frac{1}{4}$ of the trail.



Kiran ran $\frac{2}{8}$ of the trail.



3. Lin ran $\frac{2}{3}$ of the trail.



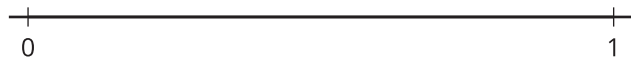
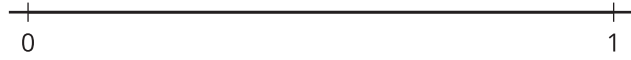
Mai ran $\frac{5}{6}$ of the trail.



12.2: Locate and Pair

1. Locate and label the following numbers on a number line. You can use more than one number line if you wish.

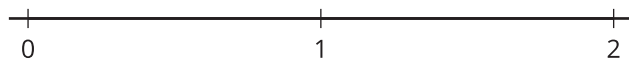
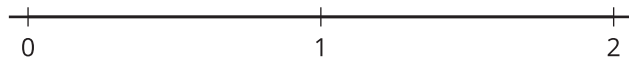
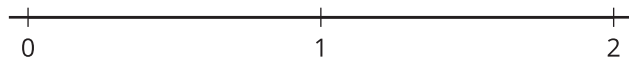
$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{2}{3}, \frac{2}{6}, \frac{3}{8}, \frac{3}{4}, \frac{4}{6}, \frac{4}{8}, \frac{6}{8}, \frac{7}{8}$



2. Find 4 pairs of fractions that are equivalent. Write equations to represent them.

_____ = _____ _____ = _____ _____ = _____ _____ = _____

If you have time: Use the number lines to generate as many equivalent fractions as you can.



12.3: Rolling for Equivalent Fractions

1. Roll 6 number cubes. If you roll any fives, they count as a wild card and can be any number you'd like.
2. Can you put the numbers you rolled in the boxes to make a statement that shows equivalent fractions? Work with your partner to find out.
3. If you cannot, re-roll as many number cubes as you'd like. You can re-roll your number cubes twice.
4. If you can make equivalent fractions, record your statement and show or explain how you know the fractions are equivalent. You get 1 point for each pair of equivalent fractions you write.

Round 1:

<div></div>	=	<div></div>
<div></div>		<div></div>

Show or explain how your fractions are equivalent.

Round 2:

<div></div>	=	<div></div>
<div></div>		<div></div>

Show or explain how your fractions are equivalent.

Round 3:

<div></div>	=	<div></div>
<div></div>		<div></div>

Show or explain how your fractions are equivalent.

Round 4:

<div></div>	=	<div></div>
<div></div>		<div></div>

Show or explain how your fractions are equivalent.

Round 5:

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

Show or explain how your fractions are equivalent.

Round 6:

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

Show or explain how your fractions are equivalent.

Round 7:

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

Show or explain how your fractions are equivalent.

Round 8:

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

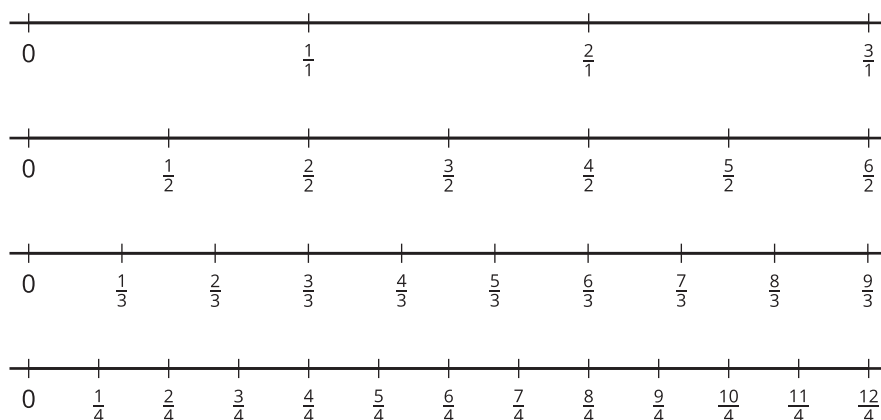
Show or explain how your fractions are equivalent.

Lesson 13: Whole Numbers and Fractions

- Let's find fractions and whole numbers that are equivalent.

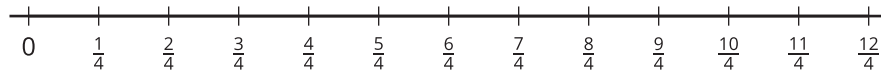
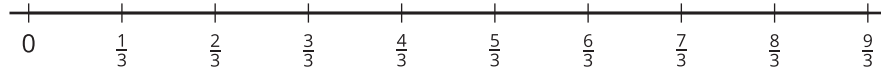
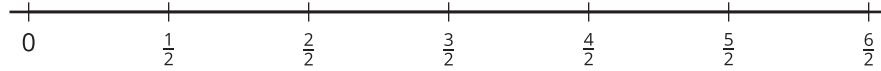
Warm-up: Notice and Wonder: Four Number Lines

What do you notice? What do you wonder?



13.1: Hidden Whole Numbers

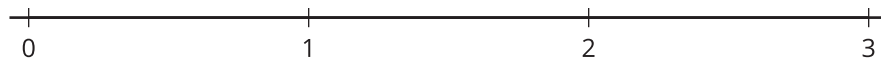
1. On each number line, circle the fractions that are equivalent to whole numbers. Explain how you know.



2. We can write $\frac{4}{2} = 2$ to show that $\frac{4}{2}$ and 2 are at the same location on the number line, so they are equivalent.

Write 5 other equations that show fractions that are equivalent to whole numbers. Use the number lines if they are helpful.

-
-
-
-
-



3. Decide if each fraction is equivalent to a whole number. Use number lines if they are helpful.

a. $\frac{11}{2}$

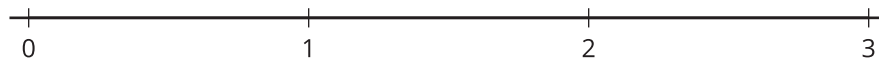
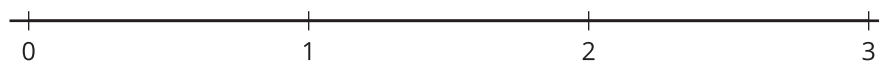
b. $\frac{5}{1}$

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

d. $\frac{10}{3}$

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

f. $\frac{16}{4}$



13.2: Write Them as Fractions

Work with your group to complete the table. In each column, write fractions that are equivalent to the whole number in the top row.

- Step 1: Write two fractions that are equivalent to each whole number (six fractions in all). Pass your paper to your right.
- Step 2: When you receive your neighbor's paper, write a new fraction that is equivalent to a whole number.
- Repeat Step 2 until the table is complete.

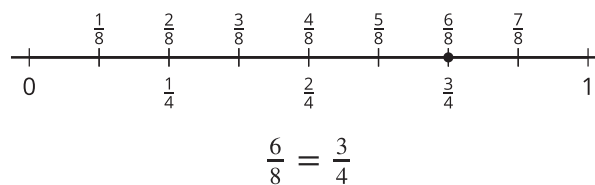
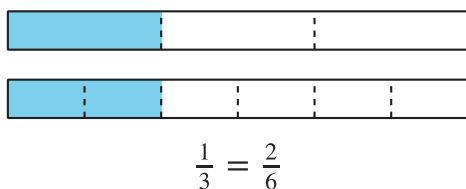
4	5	6
$\frac{4}{1}$		
	$\frac{\quad}{2}$	
		$\frac{\quad}{3}$
$\frac{\quad}{4}$		
	$\frac{30}{6}$	
		$\frac{48}{8}$



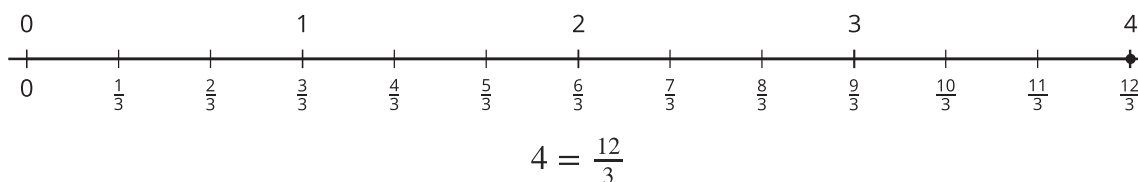
Section Summary

Section Summary

In this section, we learned that different fractions can be equivalent. We know fractions are equivalent if they are the same size or located at the same location on the number line.



We also learned that some fractions are whole numbers, and that we can write whole numbers as fractions.



Lesson 14: How Do You Compare Fractions?

- Let's represent and compare fractions.

Warm-up: Number Talk: Which Whole Numbers?

Find the whole number that each fraction is equivalent to.

- $\frac{16}{1}$

- $\frac{16}{2}$

- $\frac{16}{4}$

- $\frac{20}{4}$

14.1: Equivalent or Not?

Are these fractions equivalent? Show your thinking using diagrams, symbols, or other representations.

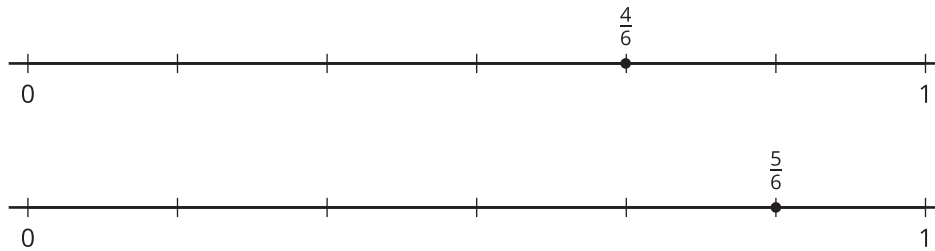
1. $\frac{1}{2}$ and $\frac{1}{3}$

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

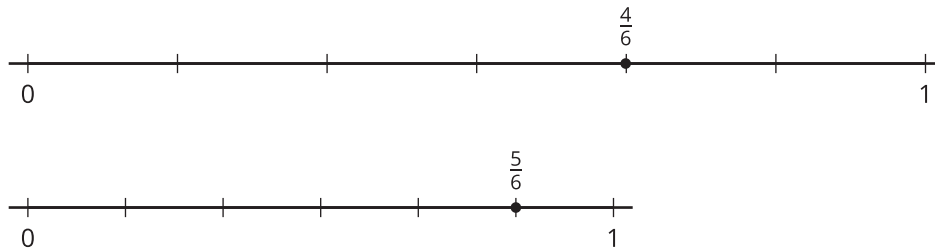
3. $\frac{3}{4}$ and $\frac{6}{8}$

14.2: Same Fractions, Different Result?

Han says $\frac{4}{6}$ is less than $\frac{5}{6}$. His work is shown.



Lin says $\frac{4}{6}$ is greater than $\frac{5}{6}$. Her work is shown.



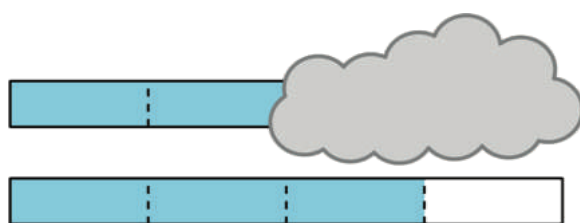
Why might Han and Lin make different comparison statements for the same fractions?

Lesson 15: Compare Fractions with the Same Denominator

- Let's compare two fractions with the same denominator.

Warm-up: Notice and Wonder: Two More Strips

What do you notice? What do you wonder?



15.1: Compare Fractions with the Same Denominator

1. For each pair of fractions, circle the fraction that is greater. Explain or show your reasoning.

a. $\frac{1}{2}$ and $\frac{3}{2}$

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

2. Use the symbols $>$ or $<$ to make each statement true. Explain or show your reasoning.

a. $\frac{1}{6}$ _____ $\frac{4}{6}$

b. $\frac{4}{4}$ _____ $\frac{5}{4}$

c. $\frac{2}{3}$ _____ $\frac{1}{3}$

d. $\frac{4}{8}$ _____ $\frac{6}{8}$

If you have time: Write in the missing numerator of the fraction to make each statement true. Explain or show your reasoning.

1. $\frac{1}{2} < \frac{\quad}{2}$

2. $\frac{6}{4} > \frac{\quad}{4}$

3. $\frac{4}{3} < \frac{\quad}{3}$

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

15.2: Spin to Win: Same Denominator

In this game, you will record fractions on number lines. Choose a writing utensil in a color different than your partner's so you can tell which fraction is whose on each number line.

1. Each player spins the paper clip. The player who spins the highest number is Player 1.
2. Player 1 chooses a denominator for the first round: 2, 3, 4, 6, or 8.
3. Each player spins for the numerator of their fraction.
4. Each player locates and labels their fraction on the same number line on the recording sheet.
5. The player with the greater fraction wins and picks the denominator for the next round.
6. Repeat for 10 rounds. The player who wins the most rounds wins the game.

Lesson 16: Compare Fractions with the Same Numerator

- Let's compare two fractions with the same numerator.

Warm-up: True or False: Unit Fractions

Decide whether each statement is true or false. Be prepared to explain your reasoning.

- $\frac{1}{2} > \frac{1}{4}$

- $\frac{1}{4} > \frac{1}{3}$

- $\frac{1}{6} > \frac{1}{8}$

16.1: Five Parts of Something

1. Priya says that $\frac{5}{6}$ is greater than $\frac{5}{8}$.

Tyler says that $\frac{5}{8}$ is greater than $\frac{5}{6}$.

Who do you agree with? Show your thinking using diagrams or number lines.

2. For each pair of fractions, which fraction do you think is greater?

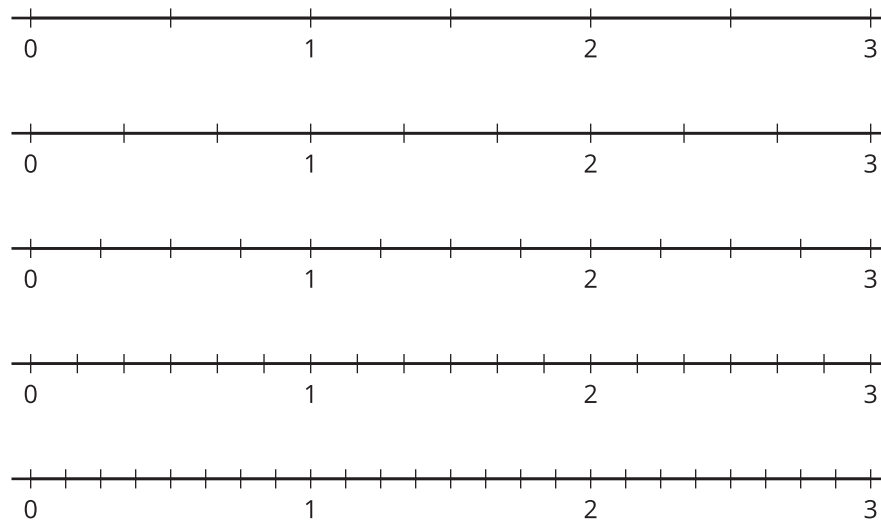
a. $\frac{5}{3}$ or $\frac{5}{4}$

b. $\frac{5}{8}$ or $\frac{5}{2}$

c. $\frac{5}{6}$ or $\frac{5}{4}$



3. Locate and label each fraction on a number line: $\frac{5}{2}$, $\frac{5}{3}$, $\frac{5}{4}$, $\frac{5}{6}$, $\frac{5}{8}$.



What do you notice about the points? Make 1-2 observations.

16.2: Fractions with the Same Numerator

1. For each pair of fractions, circle the fraction that is greater. Explain or show your reasoning.

a. $\frac{1}{4}$ and $\frac{1}{3}$

b. $\frac{3}{4}$ and $\frac{3}{8}$

c. $\frac{5}{3}$ and $\frac{5}{6}$

d. $\frac{9}{8}$ and $\frac{9}{6}$

2. Use the symbols $>$ or $<$ to make each statement true. Be prepared to explain your reasoning.

a. $\frac{2}{2}$ _____ $\frac{2}{6}$

b. $\frac{4}{3}$ _____ $\frac{4}{8}$

c. $\frac{8}{8}$ _____ $\frac{8}{4}$

d. $\frac{5}{4}$ _____ $\frac{5}{3}$

3. Write in the missing denominator of the fraction to make each statement true. Be prepared to explain your reasoning.

a. $\frac{1}{3} < \frac{1}{\underline{\hspace{1cm}}}$

b. $\frac{6}{4} > \frac{6}{\underline{\hspace{1cm}}}$

c. $\frac{4}{4} < \frac{4}{\underline{\hspace{1cm}}}$

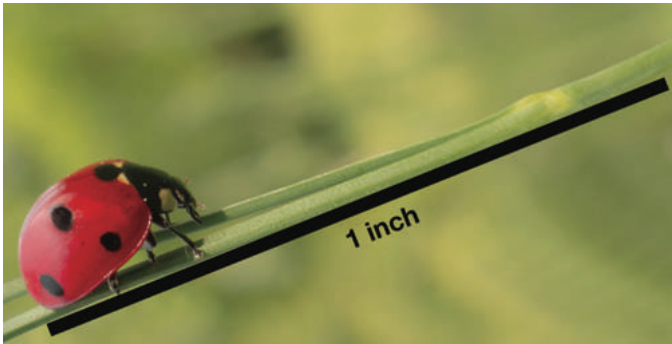
d. $\frac{2}{6} < \frac{2}{\underline{\hspace{1cm}}}$

Lesson 17: Compare Fractions

- Let’s compare more fractions in different situations.

Warm-up: Estimation Exploration: Ladybug Length

What is the length of this ladybug?



Record an estimate that is:

too low	about right	too high

17.1: Comparison Problems

For each problem:

- Answer the question and explain or show your reasoning.
- Represent your answer with a statement that uses the symbols $>$, $<$, or $=$.

1. A beetle crawled $\frac{2}{8}$ of the length of a log. A caterpillar crawled $\frac{2}{3}$ of the length of the same log. Which insect crawled farther?

2. A grasshopper is 4 centimeters long. A caterpillar is $\frac{12}{3}$ centimeters long. Which insect is longer?



4 centimeters

3. A ladybug crawled $\frac{3}{8}$ the length of a branch. An ant crawled $\frac{5}{8}$ the length of the same branch. Which insect crawled farther?

4. A grasshopper jumped $\frac{5}{8}$ the width of the sidewalk. A frog jumped $\frac{5}{6}$ the width of the same sidewalk. Which jumped a longer distance?

17.2: What Fraction Makes Sense?

1. Oh, no! Some juice spilled on Noah's fractions. Help him figure out what was written before the juice was spilled.

Find as many numbers as you can to make each statement true. Explain or show your reasoning.

a.

$$\frac{2}{8} < \frac{\text{snowflake}}{8}$$

b.

$$\frac{3}{6} = \frac{\text{snowflake}}{6}$$

c.

$$\frac{4}{3} > \frac{4}{\text{snowflake}}$$

2. For each fraction, find a fraction that is less, one that is greater, and one that is equivalent. Then, write a statement that uses the symbols $>$, $<$, or $=$ to record each comparison.

a. Less than $\frac{4}{6}$: _____

Statement:

More than $\frac{4}{6}$: _____

Statement:

Equivalent to $\frac{4}{6}$: _____

Statement:

b. Less than $\frac{3}{4}$: _____

Statement:

More than $\frac{3}{4}$: _____

Statement:

Equivalent to $\frac{3}{4}$: _____

Statement:

17.3: Ultimate Locate and Label

Locate and label each fraction on the number line. Be prepared to share your reasoning.

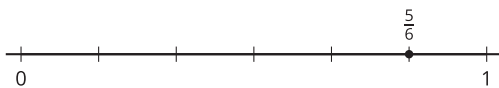
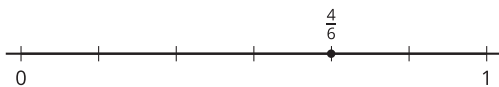
$$\frac{1}{2}, \frac{3}{8}, \frac{13}{8}, \frac{2}{4}, \frac{3}{4}, \frac{9}{8}, \frac{5}{4}, \frac{12}{6}, \frac{5}{2}, \frac{9}{3}, \frac{20}{8}$$



Section Summary

Section Summary

In this section, we compared fractions with the same numerator or denominator and used the symbols $>$, $=$, or $<$ to record our results. We used diagrams and number lines to represent our thinking.



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

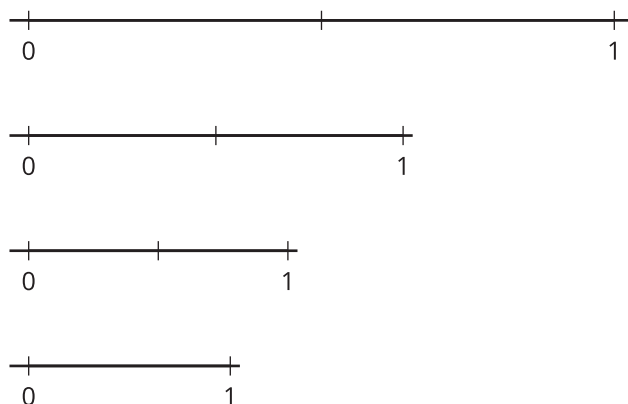
$$\frac{5}{6} > \frac{5}{8}$$

Lesson 18: Design With Fractions

- Let's use fractions to create a design.

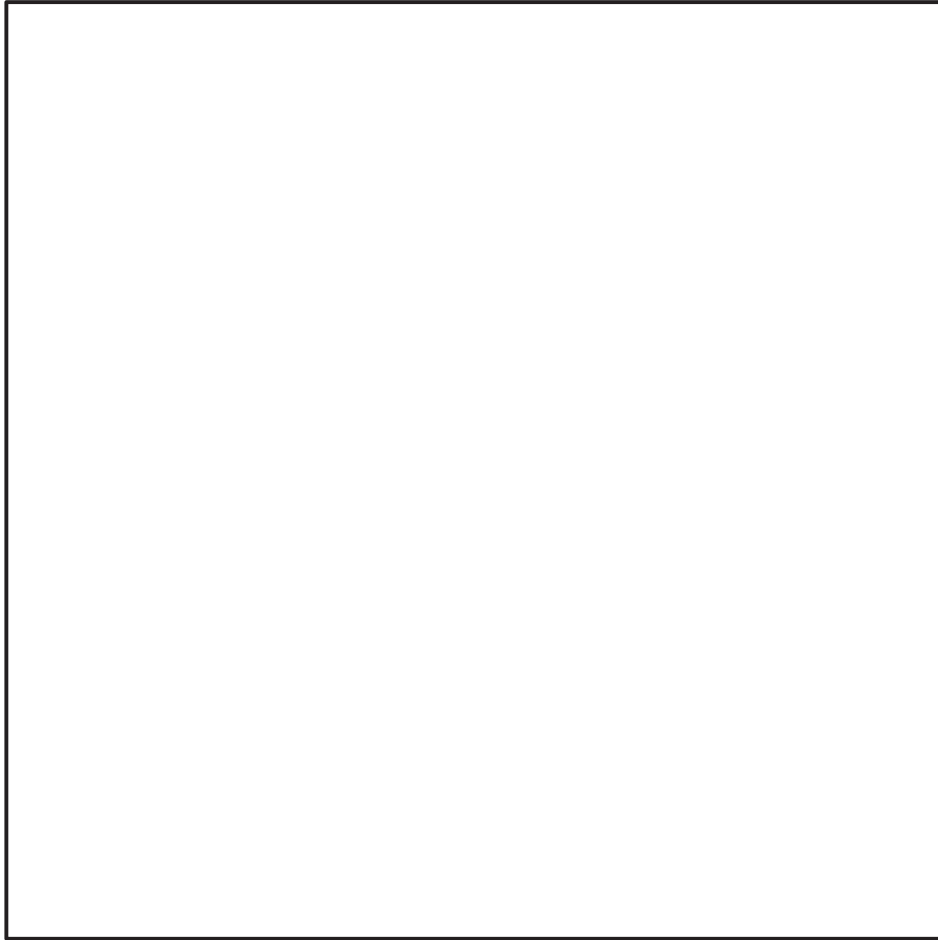
Warm-up: Notice and Wonder: Between 0 and 1

What do you notice? What do you wonder?



18.1: Design With $\frac{1}{2}$

1. Here is a square. On each side, mark a point to show $\frac{1}{2}$ of its length.

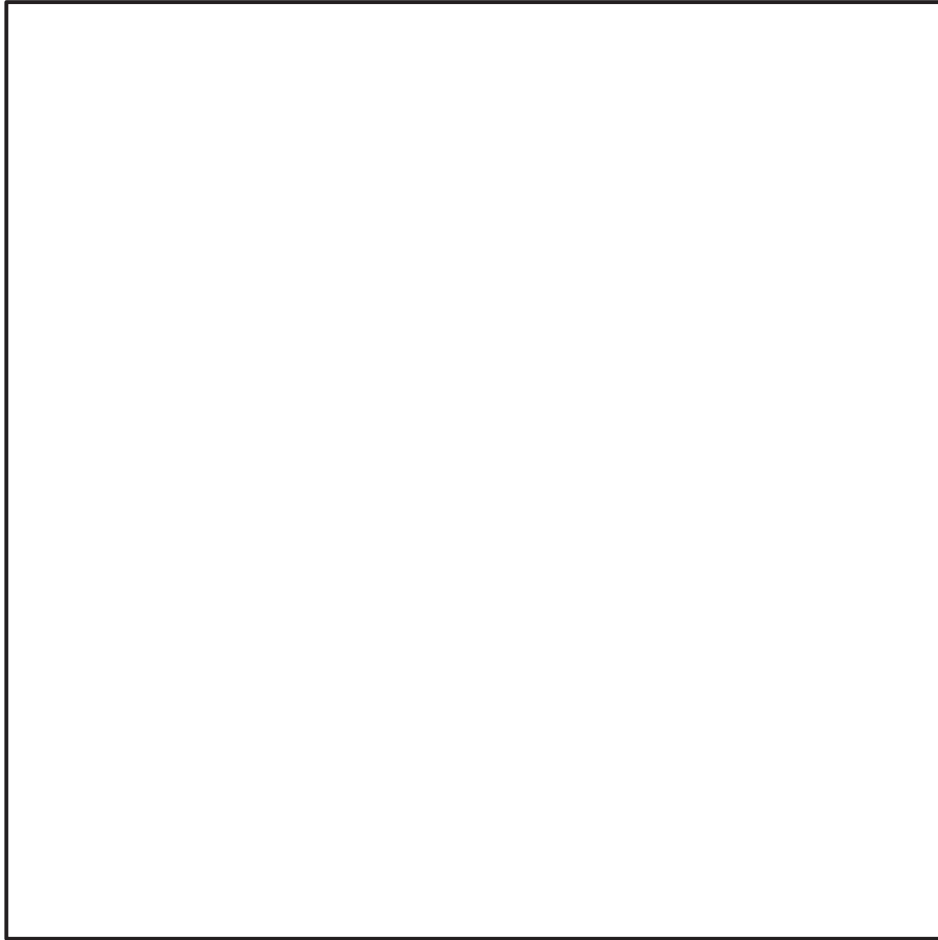


Connect each point to the point on the two sides next to it. What shape did you create?

2. Look at the new shape you created. On each side, mark a point to show $\frac{1}{2}$ of its length. Connect the points again. What shape did you create?
3. Repeat the steps you just did at least two more times. Make some observations about the design you just created.

18.2: Design With $\frac{1}{4}$

1. Here is another square. On each side, mark a point to show $\frac{1}{4}$ of its length.



Connect each point to the point on the two sides next to it. What shape did you create?

2. Look at the new shape you created. On each side, mark a point to show $\frac{1}{4}$ of its length. Connect the points again. What shape did you create?
3. Repeat the steps you just did at least two more times. Make some observations about the design you just created.

Section A: Practice Problems

1. Pre-unit

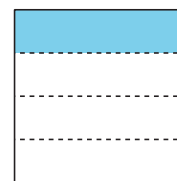
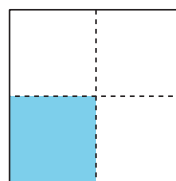
Partition the rectangle into 10 equal squares.



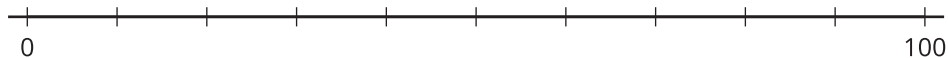
2. Pre-unit

Here are two equal-size squares. A part of each square is shaded.

Is the same amount of each square shaded? Explain or show your reasoning.



3. Pre-unit



- Label the tick marks on the number line.
- Locate and label 45 and 62 on the number line.

4. Pre-unit

Fill in each blank with $<$ or $>$ to compare the numbers.

a. 718 _____ 817

b. 106 _____ 89

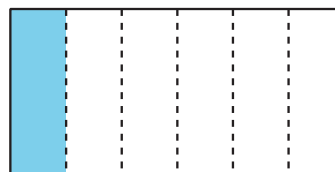
c. 806 _____ 809

5. Partition the rectangle into 6 equal parts.



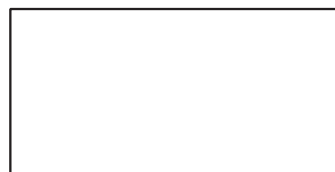
(From Unit 5, Lesson 1.)

6. a. What fraction of the rectangle is shaded?



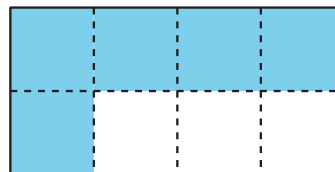
b. Partition the rectangle into 8 equal parts.

What fraction of the whole rectangle does each part represent?



(From Unit 5, Lesson 2.)

7. a. What fraction of the rectangle is shaded? Explain how you know.



b. Shade $\frac{4}{6}$ of the rectangle.



(From Unit 5, Lesson 3.)

8. Jada walks across the street at a stoplight $\frac{5}{6}$ of her way from home to school.
Represent the situation on the fraction strip. Explain your reasoning.



(From Unit 5, Lesson 4.)

9. **Exploration**

Write a situation represented by the diagram. Explain why the diagram represents your situation.



10. Exploration

Lin shaded part of some fraction strips. What fraction did she shade in each one? Explain how you know.

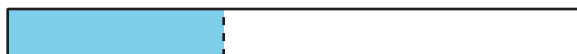
a.



b.

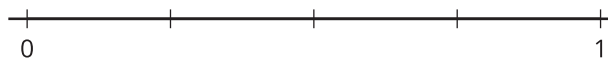


c.

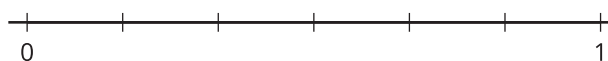


Section B: Practice Problems

1. a. Locate and label $\frac{1}{4}$ on the number line. Explain your reasoning.



- b. Locate and label $\frac{1}{6}$ on the number line. Explain your reasoning.

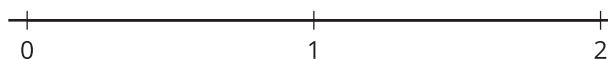


(From Unit 5, Lesson 5.)

2. a. Locate and label $\frac{1}{8}$ on the number line.

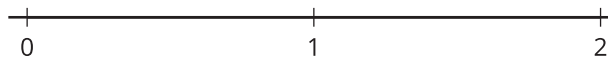


- b. Locate and label $\frac{1}{3}$ on the number line.

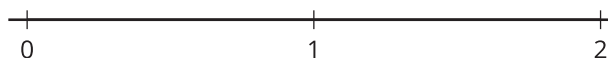


(From Unit 5, Lesson 6.)

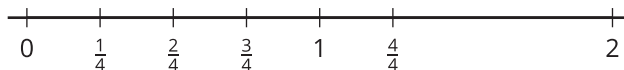
3. a. Locate and label $\frac{4}{8}$ on the number line.



- b. Locate and label $\frac{7}{6}$ on the number line.



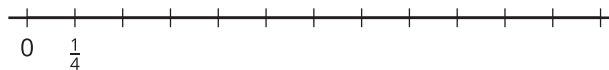
c. Diego marks and labels fourths on the number line like this:



Do you agree with Diego? Explain your reasoning.

(From Unit 5, Lesson 7.)

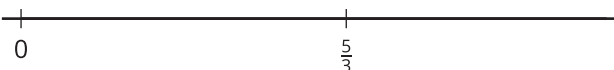
4. a. Label the tick marks on the number line.



- b. Which numbers on the number line are whole numbers? Explain how you know.

(From Unit 5, Lesson 8.)

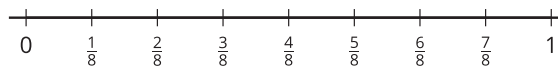
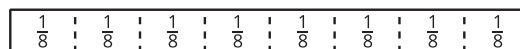
5. Locate and label 1 on the number line. Explain your reasoning.



(From Unit 5, Lesson 9.)

6. Exploration

How are the fraction strip and number line the same? How are they different?



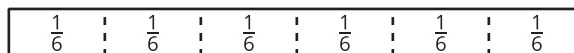
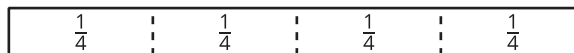
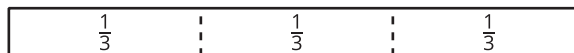
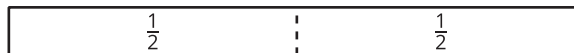
7. Exploration

Han says that he can find 1 on the number line without finding $\frac{1}{8}$. What might Han's method be?



Section C: Practice Problems

1. Select **all** correct statements.



A. $\frac{1}{2}$ is equivalent to $\frac{3}{6}$

B. $\frac{1}{2}$ is equivalent to $\frac{1}{3}$

C. $\frac{2}{2}$ is equivalent to $\frac{4}{4}$

D. $\frac{2}{2}$ is equivalent to $\frac{6}{6}$

E. $\frac{2}{3}$ is equivalent to $\frac{4}{6}$

F. $\frac{2}{3}$ is equivalent to $\frac{3}{4}$

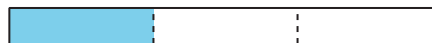
(From Unit 5, Lesson 10.)

2. Write as many fractions as you can that represent the shaded part of each diagram.

a

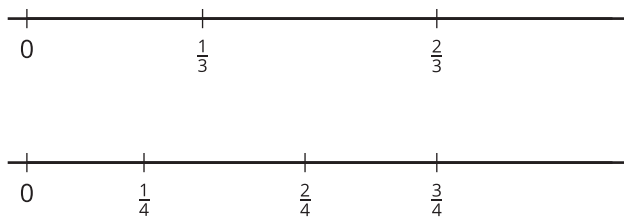


b



(From Unit 5, Lesson 11.)

3. a. Tyler draws this picture and says that $\frac{3}{4}$ is equivalent to $\frac{2}{3}$. Explain why Tyler is not correct.



- b. Find a fraction equivalent to $\frac{2}{3}$.

- c. Find a fraction equivalent to $\frac{3}{4}$.

(From Unit 5, Lesson 12.)

4. a. Write 10 as a fraction in 2 different ways.

- b. Is $\frac{88}{8}$ equivalent to a whole number?

(From Unit 5, Lesson 13.)

5. Exploration

Decide if each fraction is a whole number. Explain or show your reasoning.

a. $\frac{100}{2}$

b. $\frac{100}{3}$

c. $\frac{100}{4}$

d. $\frac{100}{6}$

e. $\frac{100}{8}$

6. Exploration

If you continue to fold fraction strips, how many parts can you fold them into? Can you fold them into 100 equal parts?

Section D: Practice Problems

1. a. Are $\frac{2}{3}$ and $\frac{4}{6}$ equivalent? Show your thinking using diagrams, symbols, or other representations.

- b. Are $\frac{6}{8}$ and $\frac{7}{8}$ equivalent? Show your thinking using diagrams, symbols, or other representations.

(From Unit 5, Lesson 14.)

2. Han says there is no fraction with denominator 8 that's greater than $\frac{8}{8}$ because $\frac{8}{8}$ is a whole. Do you agree with Han? Explain your reasoning.

(From Unit 5, Lesson 15.)

3. Use the symbols $>$ or $<$ to make each statement true. Explain your reasoning.

a. $\frac{5}{3}$ _____ $\frac{5}{2}$

b. $\frac{3}{4}$ _____ $\frac{5}{4}$

(From Unit 5, Lesson 16.)

4. a. Jada threw the ball $\frac{3}{4}$ of the length of the gym. Clare threw the ball $\frac{6}{8}$ of the length of the gym. Clare says she threw the ball farther. Do you agree? Show your thinking.

- b. Tyler kicked the ball $\frac{7}{8}$ the length of the playground. Andre kicked the ball $\frac{7}{6}$ the length of the playground. Andre says he kicked the ball farther. Do you agree? Show your thinking.

(From Unit 5, Lesson 17.)

5. Exploration

Clare walked $\frac{3}{4}$ of the way around a park. Tyler walked $\frac{3}{6}$ of the way around a different park. Who walked farther? Explain your reasoning.

6. Exploration

Choose a fraction that you can compare with both $\frac{3}{8}$ and $\frac{5}{6}$ by looking at the numerators and denominators.

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