

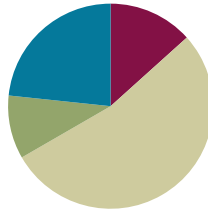
Lesson 11

Objective: Compare unit fractions with different sized models representing the whole.

Related Topics: [More Lesson Plans for the Common Core Math](#)

Suggested Lesson Structure

■ Fluency Practice	(8 minutes)
■ Application Problem	(6 minutes)
■ Concept Development	(32 minutes)
■ Student Debrief	(14 minutes)
Total Time	(60 minutes)



Fluency Practice (8 minutes)

- Skip-Count by Fourths on the Clock **3.G.2, 3.NF.1** (3 minutes)
- Greater or Less Than 1 Whole **3.G.2, 3.NF.2b** (2 minutes)
- Write Fractions Greater Than 1 Whole **3.NF.2b** (3 minutes)

Skip-Count by Fourths on the Clock (3 minutes)

Materials: (T) Clock

T: (Hold or project a clock.) Let’s skip-count by fourths on the clock starting with 5.

S: 5, 5:15, 5:30, 5:45, 6, 6:15, 6:30, 6:45, 7.

Continue with possible sequences:

- 5, 5:15, half past 5, 5:45, 6, 6:15, half past 6, 6:45, 7.
- 5, quarter past 5, half past 5, quarter ‘til 6, 6, quarter past 6, half past 6, quarter ‘til 7, 7.

Greater or Less Than 1 Whole (2 minutes)

T: (Write $\frac{1}{2}$.) Greater or less than 1 whole?

S: Less!

Continue with possible sequence: $\frac{1}{2}, \frac{3}{2}, \frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{5}{3}, \frac{3}{4}, \frac{5}{4}, \frac{11}{10}, \frac{9}{10}, \frac{11}{8}, \frac{5}{8}, \frac{11}{6}, \frac{5}{6}, \frac{11}{12}, \frac{13}{12}$.

It may be appropriate for some classes to draw responses on personal white boards for extra support.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

“Skip-Count by Fourths on the Clock” is a valuable opportunity for ELLs to practice everyday math language (time on the clock) within the comforts of the choral response.

Scaffold this quick oral fluency activity with hand clocks. As students move the minute hand to reflect the count, they are tangibly partitioning fourths of the clock (the whole).

Write Fractions Greater Than 1 Whole (3 minutes)

Materials: (S) Personal white boards

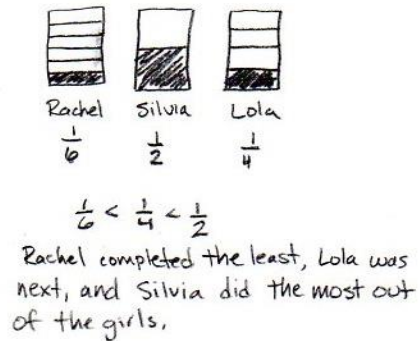
- T: How many halves are in 1 whole?
- S: 2 halves.
- T: What’s one more half than 2 halves?
- S: 3 halves.
- T: Write it as a fraction on your personal white board.
- S: (Write $\frac{3}{2}$.)

Continue with possible sequence: $\frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}, \frac{1}{6}, \frac{1}{8}$.

As students build confidence, omit the first 2 questions in the vignette.

Application Problem (6 minutes)

Rachel, Silvia, and Lola each received the same homework assignment but they only completed part of it. Rachel completed $\frac{1}{6}$ of hers, Silvia completed $\frac{1}{2}$ of hers, and Lola completed $\frac{1}{4}$ of hers. Write the amount of homework each girl completed from least to greatest. Draw a picture to prove your answer.



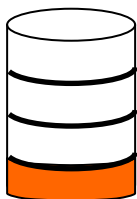
Concept Development (32 minutes)

Materials: (T) Two different sized clear plastic cups, food coloring, water (S) Personal white boards

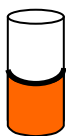
MP.6

- T: (Write 1 is the same as 1.) Show thumbs up if you agree, thumbs down if you disagree.
- S: (Most students show thumbs up.)
- T: 1 liter of soda and 1 can of soda. (Draw pictures or show objects.) Is 1 still the same as 1? Turn and talk to your partner.
- S: Yes, they’re still the same amount. → No, a liter and a can are different. → How *many* stays the same, but a liter is bigger than a can so how *much* in each is different.
- T: How *many* and how *much* are important to our question. In this case, *what* each thing is changes it too. A liter is bigger so it has more soda than a can.
- T: How does this change your thinking about “1 is the same as 1?” Tell your partner.
- S: If the thing is bigger, then it has more. → Even though the number of things is the same, *what* it is might change how *much* of it there is. → If *what* it is and how *much* it is are different, then 1 and 1 aren’t exactly the same.

- MP.6** T: As you compare 1 and 1, I hear you say that the size of the whole and how much is in it matters.
 T: The same is true when comparing fractions.
 T: For breakfast this morning, my brother and I each had a glass of juice. (Present different sized glasses partitioned into halves and fourths.)



My glass

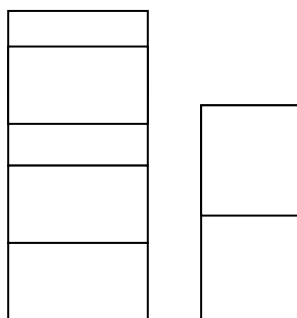


My brother's glass

- T: What fraction of my glass has juice?
 S: 1 fourth.
 T: What fraction of my brother's glass has juice?
 S: 1 half.
 T: When the wholes are the same, 1 half is greater than 1 fourth. Does this picture prove that? Discuss it with your partner.
 S: 1 half is always bigger than 1 fourth. → It looks like you might have drunk more, but the wholes aren't the same. → The glasses are different sizes like the can and the liter. We can't really compare.
 T: I'm hearing you say that we have to consider the size of the whole when we compare fractions.

You may choose to further illustrate the point by pouring each glass of juice into containers that are the same size. It may be helpful to purposefully select your containers so that 1 fourth of the large glass is the larger quantity.

To transition into the pictorial work with wholes that are the same, demonstrate with another concrete example. This time use rectangular shaped 'wholes' that are different in size like those shown below.



- T: Let's see how comparison changes when our wholes are the same. Draw two rectangles that are the same size on your board. Partition them both into thirds.
 S: (Draw and partition rectangles.)



- T: Now partition the first rectangle into sixths.
 S: (Partition the first rectangle from thirds to sixths.)



- T: Shade the unit fraction in each rectangle. Label your models and use the words 'greater than' or 'less than' to compare.
 S: (Draw models.)



is less than



$\frac{1}{6}$ is less than $\frac{1}{3}$

- T: Does this picture prove that 1 sixth is less than 1 third? Why or why not? Discuss with your partner.
 S: Yes, because the shapes are the same size. → One is just cut into more pieces than the other. → We know the pieces are smaller if there are more of them, as long as the whole is the same.

Demonstrate with more examples if necessary, perhaps rotating one of the shapes so that it appears different but does not change in size.



**NOTES ON
 MULTIPLE MEANS OF
 ENGAGEMENT:**

Students performing below grade level and others may benefit from having prepared Problem Sets that have pre-drawn wholes of the same shape and size to ease the task for those who may struggle.



**NOTES ON
 MULTIPLE MEANS OF
 ENGAGEMENT:**

The open-ended nature of this activity helps meet students above grade level where they are. Encourage their creative solutions and maintain high expectations for precision and reasoning.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Student Debrief (14 minutes)

Lesson Objective: Compare unit fractions with different sized models representing the whole.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Problem Set Problem 10 presents wholes that are clearly different sizes, and also different shapes. Students may already have questioned this as they moved through the Problem Set. If so, you may want to credit the student(s) who asked and pose the question to the rest of the class for discussion. Know that the question of shape need not be answered today since it will be specifically addressed in Lesson 20. Allowing the class to grapple with the question now may provide useful information that guides your delivery of Lesson 20.
- Guide a conversation through which students understand that to compare wholes numerically, they must be the same size. You may want to close by having students redraw the diagrams in Problem 9 so that Elizabeth is correct, and in Problem 10 so that Manny is correct.

Name: Gina Date: 3/11

Label the unit fraction. In each blank draw and label the same whole with a shaded unit fraction that makes the sentence true. There is more than 1 correct way to make the sentence true.

Sample: $\frac{1}{4}$	is less than	$\frac{1}{2}$
1. $\frac{1}{3}$	is greater than	$\frac{1}{4}$
2. $\frac{1}{5}$	is less than	$\frac{1}{2}$
3. $\frac{1}{10}$	is greater than	$\frac{1}{12}$
4. $\frac{1}{12}$	is less than	$\frac{1}{6}$
5. $\frac{1}{4}$	is greater than	$\frac{1}{8}$
6. $\frac{1}{10}$	is less than	$\frac{1}{9}$
7. $\frac{1}{8}$	is greater than	$\frac{1}{12}$

8. Fill in the blank with a fraction to make the statement true and draw a matching model.

$\frac{1}{4}$	is less than	$\frac{1}{2}$	$\frac{1}{2}$	is greater than	$\frac{1}{4}$	$\frac{1}{4}$
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9. Robert ate $\frac{1}{4}$ of a small pizza. Elizabeth ate $\frac{1}{2}$ of a large pizza. Elizabeth says, "my piece was bigger than yours, so that means $\frac{1}{4} > \frac{1}{2}$." Is Elizabeth correct? Use words and pictures to explain your answer.

$\frac{1}{4}$ is not greater than $\frac{1}{2}$ usually. The pizzas are different sizes, which means the wholes aren't the same so we can't compare. Maybe that $\frac{1}{2}$ fits inside that $\frac{1}{4}$, but we can't compare because the wholes are different.

10. Manny and Daniel each ate $\frac{1}{2}$ of their candies, shown below. Manny said he ate more candy than Daniel because his half is longer. Is he right? Explain.

Manny's Candy

Daniel's Candy Bar

Like above, the wholes are different so you can't just compare $\frac{1}{2}$ and $\frac{1}{2}$. They might be different. They are also different shapes and that even makes it harder to see if the halves are the same or different. To know Manny has to have the same candy as Daniel.

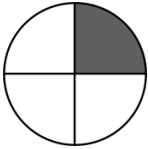
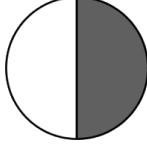




Exit Ticket (3 minutes)

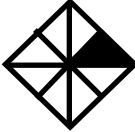


After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Name _____

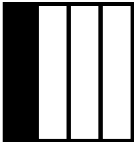

Date _____

Label the unit fraction. In each blank, draw and label the same whole with a shaded unit fraction that makes the sentence true. There is more than 1 correct way to make the sentence true.

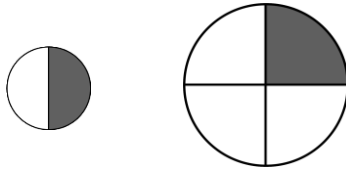
<p>Sample:</p> <p>$\frac{1}{4}$</p> 	<p>is less than</p>	<p>$\frac{1}{2}$</p> 
<p>1.</p> 	<p>is greater than</p>	
<p>2.</p> 	<p>is less than</p>	
<p>3.</p> 	<p>is greater than</p>	
<p>4.</p> 	<p>is less than</p>	

5.	is greater than	
6.	is less than	
7.	is greater than	

8. Fill in the blank with a fraction to make the statement true and draw a matching model.

					
$\frac{1}{4}$	is less than	<input style="width: 30px; height: 20px;" type="text"/>	$\frac{1}{2}$	is greater than	<input style="width: 30px; height: 20px;" type="text"/>

9. Robert ate $\frac{1}{2}$ of a small pizza. Elizabeth ate $\frac{1}{4}$ of a large pizza. Elizabeth says, “My piece was bigger than yours, so that means $\frac{1}{4} > \frac{1}{2}$.” Is Elizabeth correct? Use words and pictures to explain your answer.

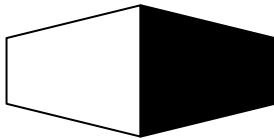


10. Manny and Daniel each ate $\frac{1}{2}$ of their candies, shown below. Manny said he ate more candy than Daniel because his half is longer. Is he right? Explain.

Manny’s Candy




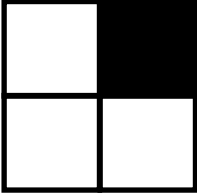
Daniel’s Candy Bar



Name _____

Date _____

1. Fill in the blank with a fraction to make the statement true and draw a matching model.



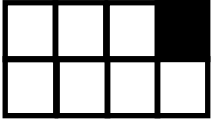
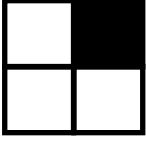
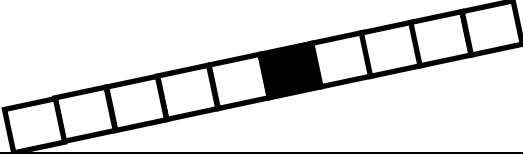
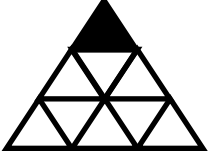
			
$\frac{1}{7}$ is less than <input style="width: 30px; height: 20px;" type="text"/>		$\frac{1}{4}$ is greater than <input style="width: 30px; height: 20px;" type="text"/>	

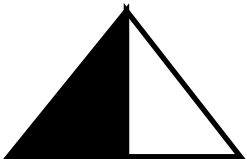
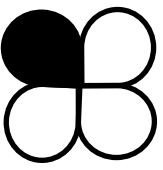
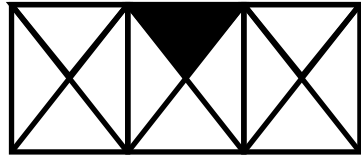
2. Tatiana ate $\frac{1}{2}$ of a small carrot. Louis ate $\frac{1}{4}$ of a large carrot. Who ate more carrot? Use words and pictures to explain your answer.

Name _____

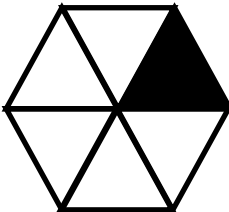
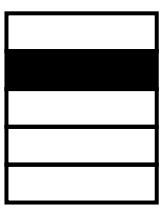
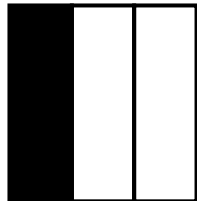
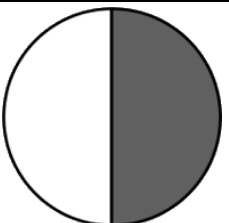
Date _____

Label the unit fraction. In each blank draw and label the same whole with a shaded unit fraction that makes the sentence true. There is more than 1 correct way to make the sentence true.

<p>Sample:</p> <p>$\frac{1}{3}$</p> 	<p>is less than</p>	<p>$\frac{1}{2}$</p> 
<p>1.</p> 	<p>is greater than</p>	
<p>2.</p> 	<p>is less than</p>	
<p>3.</p> 	<p>is greater than</p>	
<p>4.</p> 	<p>is less than</p>	

5.	is greater than	
6.	is less than	
7.	is greater than	

8. Fill in the blank with a fraction to make the statement true and draw a matching model.

			
$\frac{1}{6}$	is greater than <input type="text"/>	$\frac{1}{5}$	is less than <input type="text"/>
			
$\frac{1}{3}$	is less than <input type="text"/>	$\frac{1}{2}$	is greater than <input type="text"/>

9. Debbie ate $\frac{1}{8}$ of a large brownie. Julian ate $\frac{1}{2}$ of a small brownie. Julian says, "I ate more brownies than you because $\frac{1}{2} > \frac{1}{8}$."
- a. Use pictures and words to explain Julian's mistake.
- b. How could you change the problem so that Julian is correct? Use pictures and words to explain.