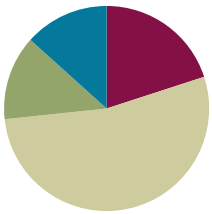
Lesson 1

Objective: Specify and partition a whole into equal parts, identifying and counting unit fractions using concrete models.

Related Topics: More Lesson Plans for the Common Core Math

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(8 minutes)
Concept Development	(32 minutes)
Student Debrief	(8 minutes)
Total Time	**(60 minutes)**



Fluency Practice (12 minutes)

- Skip Counting by Four and Eight **3.OA.4** (6 minutes)
- Multiplication by Four and Eight **3.OA.4** (6 minutes)

Skip Counting by Four and Eight (6 minutes)

Materials: (S) Personal white boards (use if students struggle to answer verbally)

By Fours:

Skip count forward and backward by fours two times with a pause between each effort so students see themselves improve on the second try. After doing the fours twice, have students underline the multiples of 8. (e.g., 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 36, 32, 28, 24, 20, 16, 12, 8, 4, 0)

By Eights:

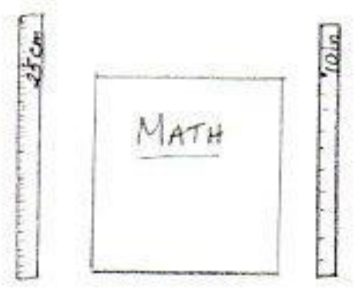
Skip count forward and backward by eights two times with a pause between each effort to analyze weak points.

2 x 4 = 8	2 x 8 = 16
3 x 4 = 12	3 x 8 = 24
4 x 4 = 16	4 x 8 = 32

Multiplication by Four and Eight (6 minutes)

Choose your mode of delivery (e.g., oral work, personal white board, etc.). Have students pair facts of 4 and 8 and uncover the doubling.

Application Problem (8 minutes)



Measure the length of your paper or math textbook using a ruler. Your teacher will tell you whether to measure in inches or centimeters. (Assign partners different units.) After students complete the measurement on their own and compare their answer to their partner's, have them consider the following questions.

- Which is a larger unit, an inch or a centimeter?
- Therefore, which would yield a greater number when measuring the book, inches or centimeters?
- Measure at least 2 different items with your partner, again using different units. What do you notice?
- Change units with your partner. Measure different items again.

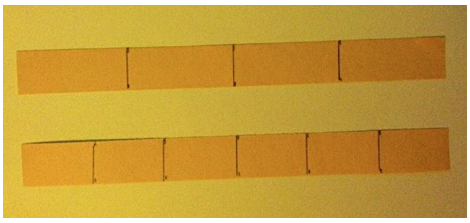
Concept Development (32 minutes)

Materials: (T) 1 clear plastic cup full of colored water, 2 other empty identical clear plastic cups, two 12" by 1" strips of yellow construction paper (S) Two 12" by 1" strips of yellow construction paper for each student, 12 inch rulers for each student

T: Measure your yellow strip of paper using inches. How long is it?
S: 12 inches.
T: Make a small mark at 6 inches at both the top and bottom of the strip. Connect the two points with a straight line.
T: (After students do so.) How many equal parts or units have I split the paper into now?
S: Two.
T: What fraction of the whole strip is one of the parts?
S: 1 half.
T: Point and count the halves with me.
S: 1 half, 2 halves. (Point to each half of the strip as students count "one half, two halves.")
T: Discuss with your partner how we know these parts are equal.
S: When I fold the strip along the line, the two sides match perfectly. → Because I measured and saw that each part was 6 inches long. → The whole strip is 12 inches long. 12 divided by 2 is six. → 6 times 2 or 6 plus 6 is 12, so they are equal in length.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Review and post frequently used vocabulary, such as '1 third' accompanied by a picture of '1 third', '1 out of 3 equal parts', and '1/3.'



Continue with fourths on the same strip followed by thirds and sixths on the second strip.

Fourths:

Repeat the same line of questioning as with measuring halves.

T: Make a small mark at 3 inches and 9 inches at the top and bottom of your strip. Connect the two points with a straight line. How many equal parts do you have now?

S: Four.

T: Count the fourths.

S: 1 fourth, 2 fourths, 3 fourths, 4 fourths.

T: Discuss with your partner how you know that these parts are equal.

Thirds:

Again repeat the same line of questioning. Have the students mark off 4 inches and 8 inches at the top and bottom of their strips. Ask them to identify the fraction. Ask them how they know the parts are equal and then have them count the equal parts, "1 third, 2 thirds, 3 thirds".

Sixths:

Have the students mark off points at 2 inches, 6 inches and 10 inches. Repeat the same process as with halves, fourths, and thirds. Ask students to think about the relationship of the halves to the fourths and the thirds to the sixths.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

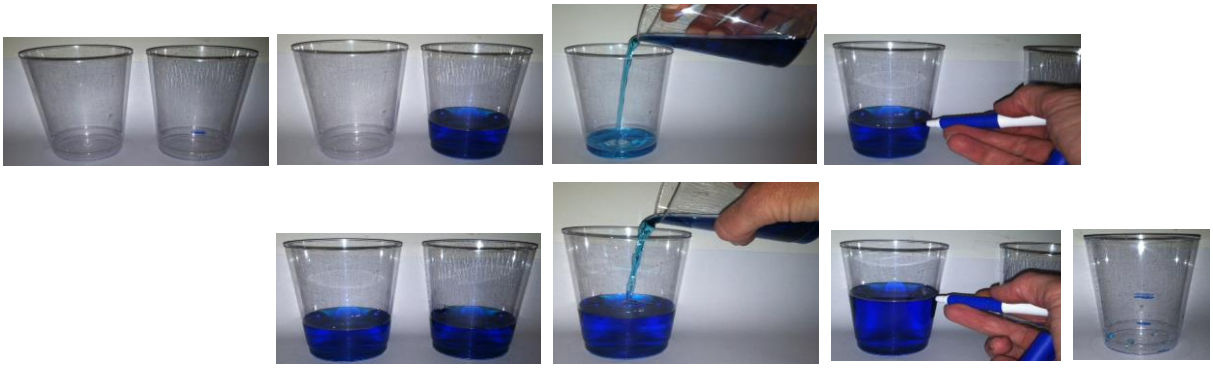
Some students may benefit from a review of how to use a ruler to measure. You might suggest the following:

1. Identify the zero mark on the ruler.
2. Line up the zero mark with the left end of the yellow paper strip.
3. Push down on the ruler as you make your mark.

Additionally, students who would like more of a challenge can think about how to find eighths.

T: Just as we measured a whole strip of paper with a ruler to make halves, let's now measure precisely to make 2 equal parts of a whole amount of liquid.

- Present two identical glasses as below.



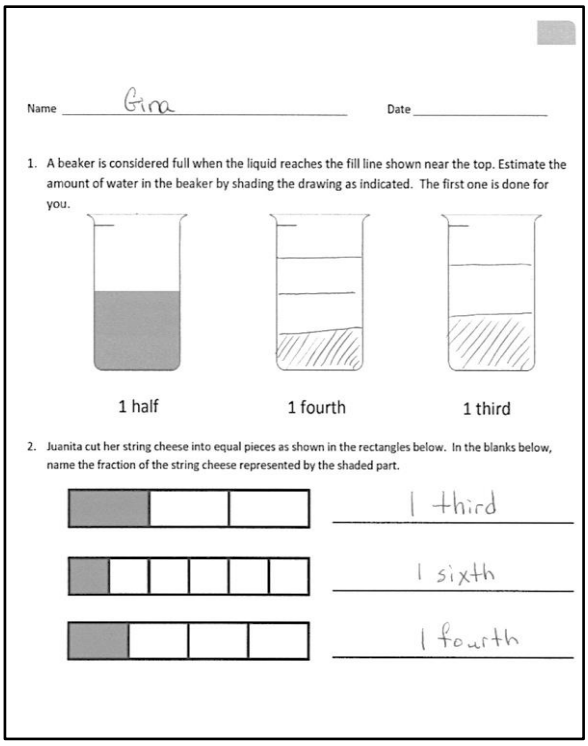
- The glass to the right has a mark about 1 fourth the way up the cup.
- Fill the cup to that mark as in the second image.
- Pour that amount of liquid into the cup on the left and mark off the top of that amount of liquid.

- Repeat the process. Fill the right hand cup again to the mark and pour it into the left hand cup.
- Mark off the top of that amount of liquid. The cup now shows precisely the markings for half the amount of water and the whole amount of water. Have the students share to discuss how they can be sure the middle mark shows half the liquid. Compare the yellow strip showing a whole partitioned into 2 equal parts and the blue liquid partitioned into 2 equal parts. Have the students discuss how they are the same and different.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the careful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.


Name Gina Date

1. A beaker is considered full when the liquid reaches the fill line shown near the top. Estimate the amount of water in the beaker by shading the drawing as indicated. The first one is done for you.

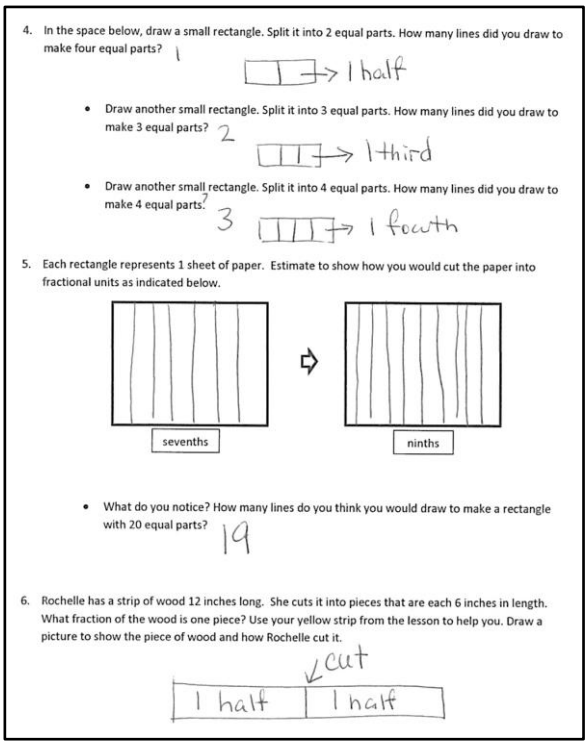
1 half 1 fourth 1 third

2. Juanita cut her string cheese into equal pieces as shown in the rectangles below. In the blanks below, name the fraction of the string cheese represented by the shaded part.

1 third

1 sixth

1 fourth


4. In the space below, draw a small rectangle. Split it into 2 equal parts. How many lines did you draw to make four equal parts? 1 → 1 half

- Draw another small rectangle. Split it into 3 equal parts. How many lines did you draw to make 3 equal parts? 2 → 1 third
- Draw another small rectangle. Split it into 4 equal parts. How many lines did you draw to make 4 equal parts? 3 → 1 fourth

5. Each rectangle represents 1 sheet of paper. Estimate to show how you would cut the paper into fractional units as indicated below.

sevenths ninths

- What do you notice? How many lines do you think you would draw to make a rectangle with 20 equal parts? 19

6. Rochelle has a strip of wood 12 inches long. She cuts it into pieces that are each 6 inches in length. What fraction of the wood is one piece? Use your yellow strip from the lesson to help you. Draw a picture to show the piece of wood and how Rochelle cut it.

cut

1 half | 1 half

Student Debrief (8 minutes)

Lesson Objective: Specify and partition a whole into equal parts, identifying and counting unit fractions using concrete methods.

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.

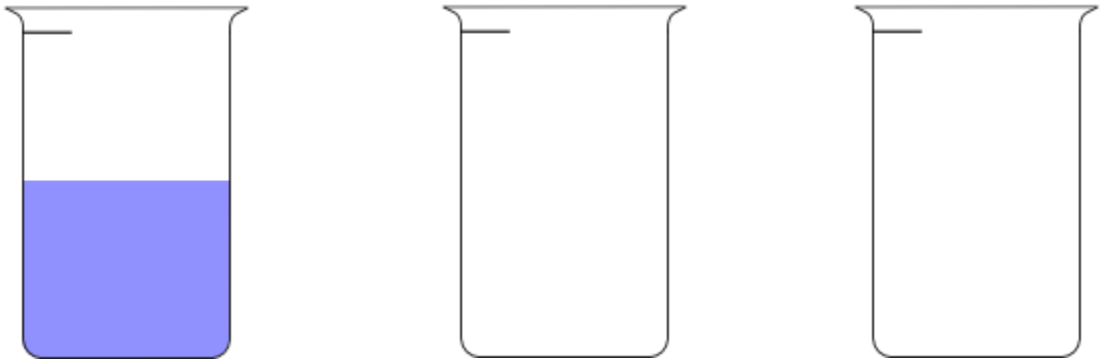
- Encourage students to use the words, "equal parts, fraction, the whole, half, fourths, thirds, sixths."
- The whole, the yellow strip never changes. What happened to the size of the equal parts when it was divided into more parts?
- In Problem 1, which was the harder fraction for you to draw well?
- Using our method with the cups, how could we make a cup that showed thirds?
- In Problem 2, what do you notice about the thirds and the sixths? When we made our measurements on the yellow strips, what did you remember about the measurement of 1 third of the strip and 1 sixth of the strip?
- In Problem 3, did you start drawing fourths by making a half? Can you do the same to draw eighths?
- Walk through the process explicitly of estimating to draw a half, then a half of a half to make fourths, etc.
- In Problem 4, describe to your partner how you can use an estimate of thirds to draw sixths.
- In Problems 5 and 6, let's look at two different solution strategies and compare them.

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 _____

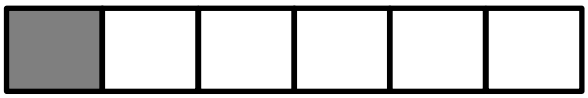
1. A beaker is considered full when the liquid reaches the fill line shown near the top. Estimate the amount of water in the beaker by shading the drawing as indicated. The first one is done for you.



1 half 1 fourth 1 third

2. Juanita cut her string cheese into equal pieces as shown in the rectangles below. In the blanks below, name the fraction of the string cheese represented by the shaded part.

_____



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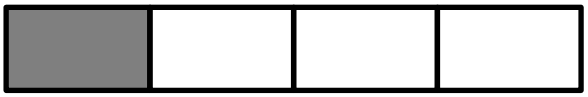


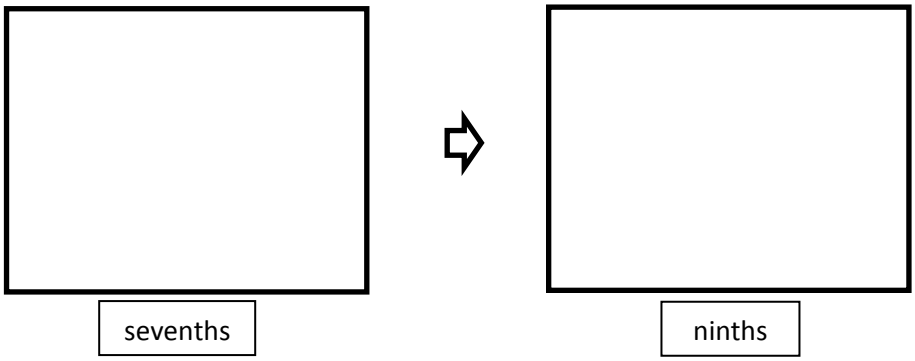
_____

3. In the space below, draw a small rectangle. Estimate to split it into 2 equal parts. How many lines did you draw to make 2 equal parts? What is the name of each fractional unit?

   - Draw another small rectangle. Estimate to split it into 3 equal parts. How many lines did you draw to make 3 equal parts? What is the name of each fractional unit?

   - Draw another small rectangle. Estimate to split it into 4 equal parts. How many lines did you draw to make 4 equal parts? What is the name of each fractional unit?

4. Each rectangle represents 1 sheet of paper. Estimate to show how you would cut the paper into fractional units as indicated below.

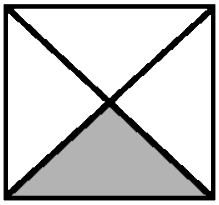


   - What do you notice? How many lines do you think you would draw to make a rectangle with 20 equal parts?

5. Rochelle has a strip of wood 12 inches long. She cuts it into pieces that are each 6 inches in length. What fraction of the wood is one piece? Use your yellow strip from the lesson to help you. Draw a picture to show the piece of wood and how Rochelle cut it.

Name _____ Date _____

1. Name the fraction that is shaded



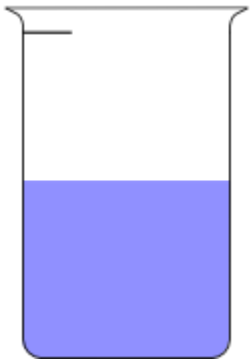
_____

2. Estimate to partition the rectangle into thirds

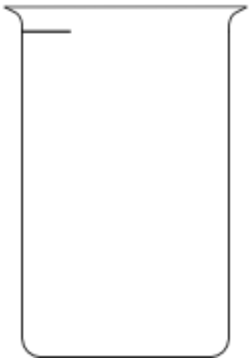
3. A plumber has 12 feet of pipe. He cuts it into pieces that are each 3 feet in length. What fraction of the pipe would one piece represent? (Use your yellow strip from the lesson to help you.)

Name _____ Date _____

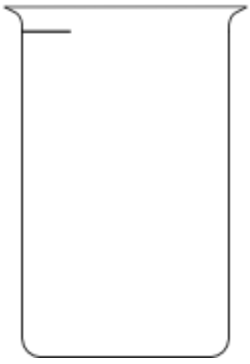
1. A beaker is considered full, when the liquid reaches the fill line shown near the top. Estimate the amount of water in the beaker by shading the drawing as indicated. The first one is done for you.



1 half



1 fifth

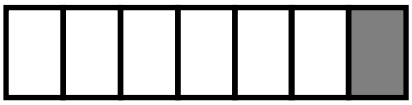


1 sixth

2. Danielle cut her candy bar into equal pieces as shown in the rectangles below. In the blanks below, name the fraction of candy bar represented by the shaded part.

_____

_____



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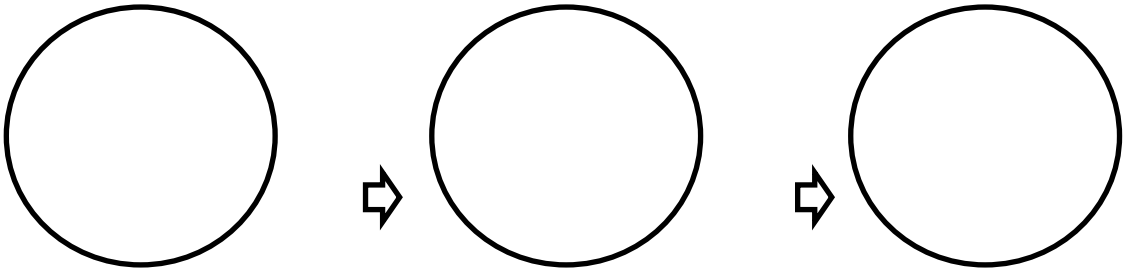
3. Each circle represents 1 whole pie. Estimate to show how you would cut the pie into fractional units as indicated below.

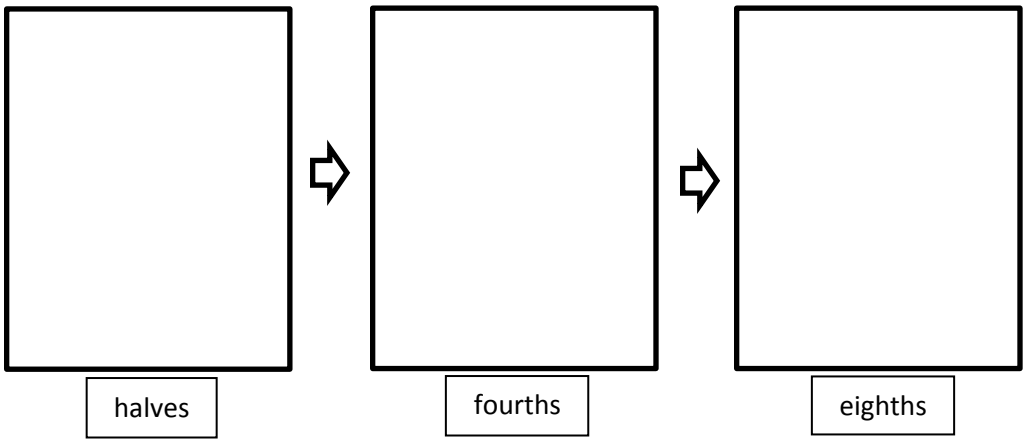


halves

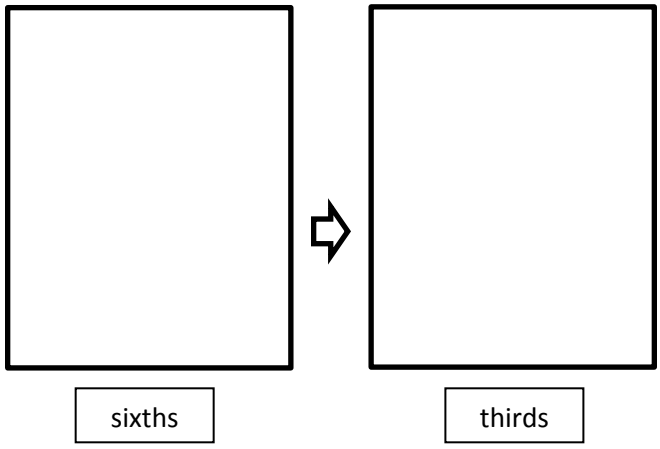
thirds

sixths

4. Each rectangle represents 1 sheet of paper. Estimate to draw lines to show how you would cut the paper into fractional units as indicated below.



5. Each rectangle represents 1 sheet of paper. Estimate to draw lines to show how you would cut the paper into fractional units as indicated below.



6. Yuri has a rope 12m long. He cuts it into pieces that are each 2m long. What fraction of the rope is one piece? (Use your yellow strip from the lesson to help you.) Draw a picture.

7. Dawn bought 12 grams of chocolate. She ate half of the chocolate. How many grams of chocolate did she eat?