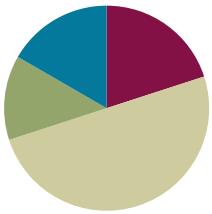
Lesson 23

Objective: Generate simple equivalent fractions by using visual fraction models and the number line.

Related Topics: More Lesson Plans for the Common Core Math

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Concept Development	(30 minutes)
Application Problem	(8 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (12 minutes)

- Adding by 6 Sprint **2.NBT.5** (8 minutes)
- Find the Equivalent Fraction **3.NF.3d** (4 minutes)

Adding by 6 Sprint (8 minutes)

Materials: (S) Adding by 6 Sprint

Find the Equivalent Fraction (4 minutes)

Materials: (T) Prepared fraction images (S) Personal white boards

T: (Project a square partitioned into 2 parts with 1 part shaded in.) Say the fraction.

S: 1 half.

T: (Write $\frac{1}{2}$ underneath the square.) Copy my picture and fraction on your boards.

S: (Copy image and fraction on their boards.)

T: (Project an identical square to the right of the first.) On your board, draw a second identical square.

S: (Draw a second identical square.)

T: (Below the squares write $\frac{1}{2} = \frac{\ }{4}$.) On your board, make your second square into parts of 4 and fill-in the number sentence.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

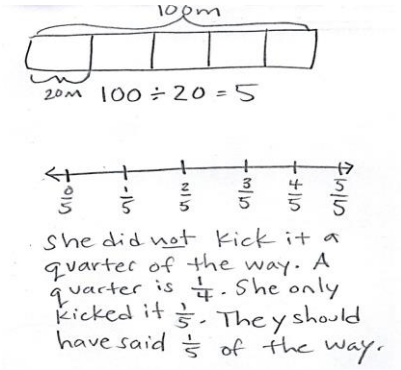
Students below grade level may enjoy counting fractions more than once. First, with the addition of models (e.g.,. shading fourths), then without, gradually increasing speed with each repetition.

S: (Draw a horizontal line to show 2 parts of 4 shaded. Under pictures they write $\frac{1}{2} = \frac{2}{4}$.)

Continue with possible sequence: $\frac{1}{2} = \frac{\_}{6}, \frac{2}{8} = \frac{\_}{4}, \frac{5}{10} = \frac{\_}{20}$.

Application Problem (8 minutes)

The soccer player stood at the corner of a 100 meter field and kicked the ball to her teammate. She kicked it 20 meters. The commentator said she kicked it a quarter of the way across the field. Is that true? If not, what fraction should the commentator have said? Prove your answer by using a number line.



Concept Development (30 minutes)

Materials: (S) Index cards (1 per pair, described below), sentence strips, chart paper, markers, glue, math journals

Students are seated in pairs. Each pair gets one sentence strip and an index card. The index card designates endpoints on a number line and a unit with which to partition, example to the right.

Intervals 2-4

Fifths

Group A

Divide your class so each group is composed of pairs (each group contains more than 1 pair). Create the following index cards and distribute one card to each pair per group:

Group A: Intervals 3-5, thirds and sixths

Group B: Intervals 1-3, sixths and twelfths

Group C: Intervals 3-5, halves and fourths

Group D: Intervals 1-3, fourths and eighths

Group E: Intervals 4-6, sixths and twelfths

Group F: Intervals 6-8, halves and fourths

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Differentiate the activity by strategically assigning "just right" intervals and units to pairs of students.

T: With your partner use your sentence strip to make a number line with your given intervals. Then estimate to partition into your given unit by folding your sentence strip. Label the endpoints and the unit fractions. Rename the wholes.

S: (Work in pairs.)

T: (Give one piece of chart paper to a member of each letter group.) Now stand up and find your other letter group members. Once you've found them, glue your number lines in a column so that ends match up on your chart paper. Compare number lines to find equivalent fractions. Record all possible equivalent fractions in your math journals.

S: (Find letter group members, glue fraction strips onto chart paper. Letter group members discuss and record equivalent fractions.)

T: (Hang each chart paper around the room.) Now we're going to do a "gallery walk". As a letter group you will visit the other groups' chart papers. One person in each group will be the recorder. You can switch recorders each time you visit a new chart paper. Your job will be to find and list all of the equivalent fractions you see at each chart paper.

S: (Go to another letter group's chart paper and begin.)

T: (Rotate groups briskly so that at the beginning students don't finish finding all fractions at 1 station. As letter groups rotate and chart papers fill up, challenge groups to check others' work to make sure no fractions are missing.)

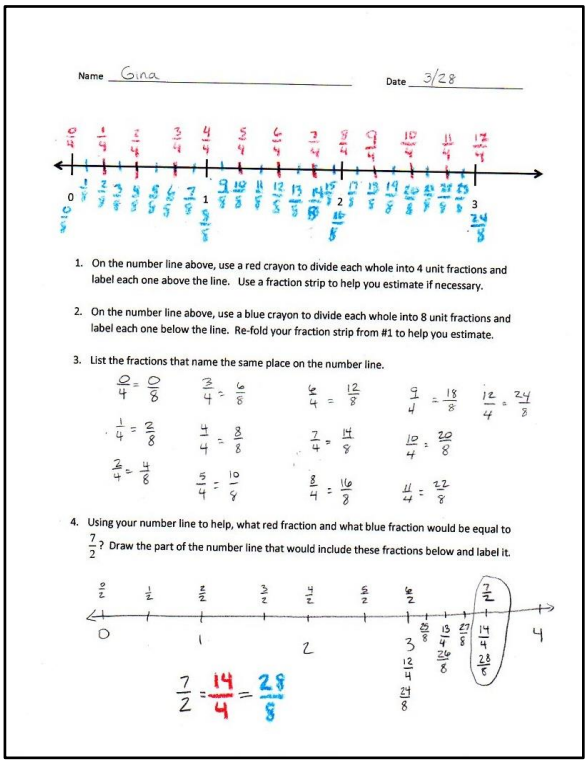
NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Challenge above grade level students to write more than two equivalent fractions on the Problem Set. As they begin to generate equivalencies mentally and rapidly, guide students to articulate the pattern and its rule.

T: (After rotation is complete.) Go back to your own chart paper with your letter group. Take your math journals and check your friends' work. Did they name the same equivalent fractions you found?

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.


Name Gina Date 3/28

1. On the number line above, use a red crayon to divide each whole into 4 unit fractions and label each one above the line. Use a fraction strip to help you estimate if necessary.
2. On the number line above, use a blue crayon to divide each whole into 8 unit fractions and label each one below the line. Re-fold your fraction strip from #1 to help you estimate.
3. List the fractions that name the same place on the number line.
4. Using your number line to help, what red fraction and what blue fraction would be equal to $\frac{7}{2}$? Draw the part of the number line that would include these fractions below and label it.

$\frac{7}{2} = \frac{14}{4} = \frac{28}{8}$

Student Debrief (10 minutes)

Lesson Objective: Generate simple equivalent fractions by using visual fraction models and the number line. [Day 2 of L23]

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

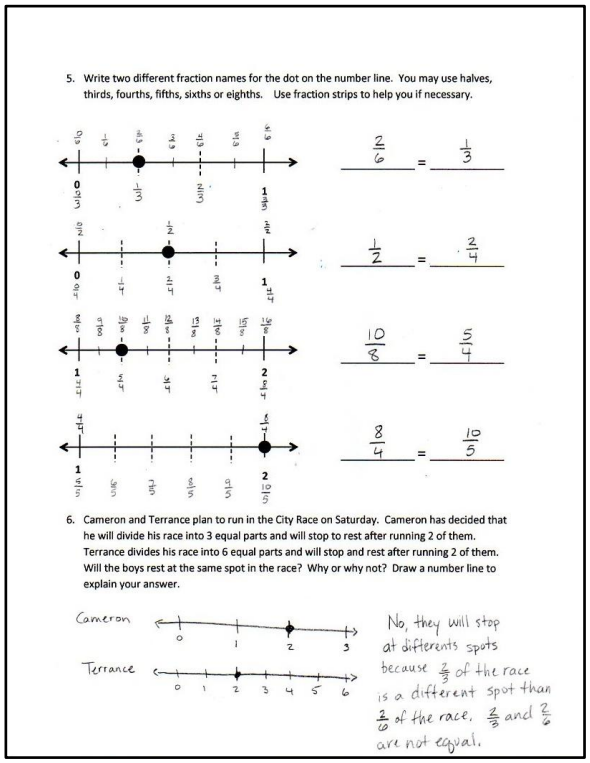
Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set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

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

- Could you have compared with another number line? What would the result be?
- How did it change your work when the interval on your number line was no longer from 0 to 1?
- Could we sequentially connect the number lines we made by interval even though they are partitioned into different units? What would happen then?
- Compare all of the answers for Problem Set Problem 5. (Use this comparison to advance the idea that the world of fractions is endless. There are many different fractions that label a single point.)

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.



5. Write two different fraction names for the dot on the number line. You may use halves, thirds, fourths, fifths, sixths or eighths. Use fraction strips to help you if necessary.

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

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

$\frac{10}{8} = \frac{5}{4}$

$\frac{8}{4} = \frac{10}{5}$

6. Cameron and Terrance plan to run in the City Race on Saturday. Cameron has decided that he will divide his race into 3 equal parts and will stop to rest after running 2 of them. Terrance divides his race into 6 equal parts and will stop and rest after running 2 of them. Will the boys rest at the same spot in the race? Why or why not? Draw a number line to explain your answer.

Cameron 0 1 2 3

Terrance 0 1 2 3 4 5 6

No, they will stop at differents spots because $\frac{2}{3}$ of the race is a different spot than $\frac{2}{6}$ of the race. $\frac{2}{3}$ and $\frac{2}{6}$ are not equal.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

To assist comprehension, develop multiples way to ask the same question. For example, you might change the question, "Could we sequentially…?" to "What if we put all the number lines together in numerical order?" or "What do you think of a number line whose unit intervals are partitioned into different unit fractions?"

A

Correct _____

Add.

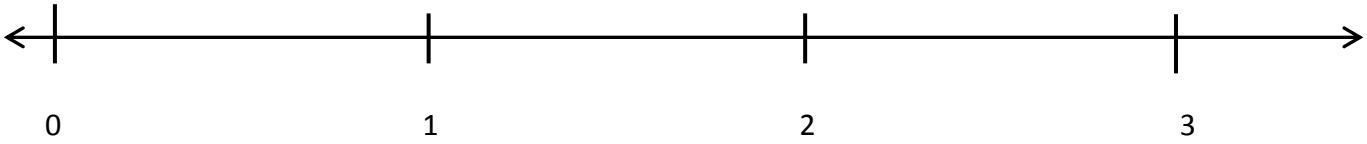
1	0 + 6 =		23	7 + 6 =	
2	1 + 6 =		24	17 + 6 =	
3	2 + 6 =		25	27 + 6 =	
4	3 + 6 =		26	37 + 6 =	
5	4 + 6 =		27	47 + 6 =	
6	6 + 4 =		28	77 + 6 =	
7	6 + 3 =		29	8 + 6 =	
8	6 + 2 =		30	18 + 6 =	
9	6 + 1 =		31	28 + 6 =	
10	6 + 0 =		32	38 + 6 =	
11	15 + 6 =		33	48 + 6 =	
12	25 + 6 =		34	78 + 6 =	
13	35 + 6 =		35	9 + 6 =	
14	45 + 6 =		36	19 + 6 =	
15	55 + 6 =		37	29 + 6 =	
16	85 + 6 =		38	39 + 6 =	
17	6 + 6 =		39	89 + 6 =	
18	16 + 6 =		40	6 + 75 =	
19	26 + 6 =		41	6 + 56 =	
20	36 + 6 =		42	6 + 77 =	
21	46 + 6 =		43	6 + 88 =	
22	76 + 6 =		44	6 + 99 =	

B Improvement _____ # Correct _____

Add.

1	6 + 0 =		23	7 + 6 =	
2	6 + 1 =		24	17 + 6 =	
3	6 + 2 =		25	27 + 6 =	
4	6 + 3 =		26	37 + 6 =	
5	6 + 4 =		27	47 + 6 =	
6	4 + 6 =		28	67 + 6 =	
7	3 + 6 =		29	8 + 6 =	
8	2 + 6 =		30	18 + 6 =	
9	1 + 6 =		31	28 + 6 =	
10	0 + 6 =		32	38 + 6 =	
11	5 + 6 =		33	48 + 6 =	
12	15 + 6 =		34	88 + 6 =	
13	25 + 6 =		35	9 + 6 =	
14	35 + 6 =		36	19 + 6 =	
15	45 + 6 =		37	29 + 6 =	
16	75 + 6 =		38	39 + 6 =	
17	6 + 6 =		39	79 + 6 =	
18	16 + 6 =		40	6 + 55 =	
19	26 + 6 =		41	6 + 76 =	
20	36 + 6 =		42	6 + 57 =	
21	46 + 6 =		43	6 + 98 =	
22	86 + 6 =		44	6 + 89 =	

Name _____ Date _____



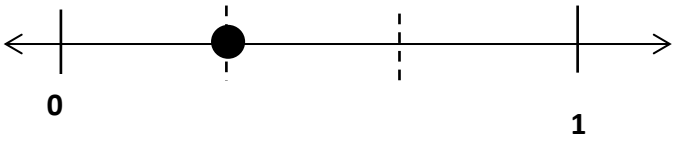
1. On the number line above, use a red colored pencil to divide each whole into 4 unit fractions and label each one above the line. Use a fraction strip to help you estimate if necessary.

2. On the number line above, use a blue colored pencil to divide each whole into 8 unit fractions and label each one below the line. Re-fold your fraction strip from #1 to help you estimate.

3. List the fractions that name the same place on the number line.

4. Using your number line to help, what red fraction and what blue fraction would be equal to $\frac{7}{2}$? Draw the part of the number line that would include these fractions below and label it.

5. Write two different fraction names for the dot on the number line. You may use halves, thirds, fourths, fifths, sixths or eighths. Use fraction strips to help you if necessary.



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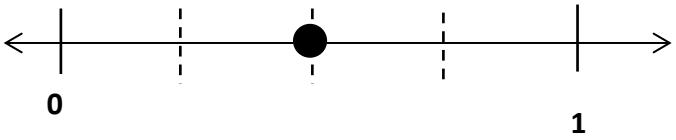

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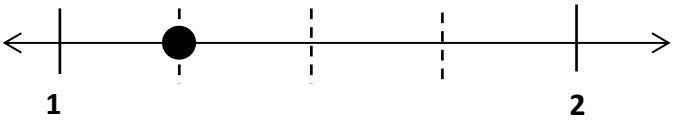

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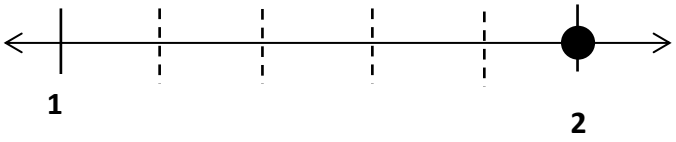

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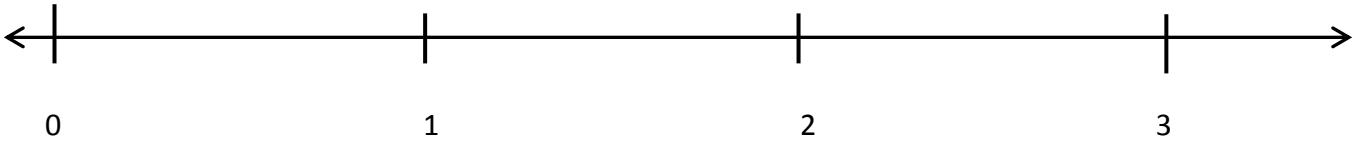
6. Cameron and Terrance plan to run in the City Race on Saturday. Cameron has decided that he will divide his race into 3 equal parts and will stop to rest after running 2 of them. Terrance divides his race into 6 equal parts and will stop and rest after running 2 of them. Will the boys rest at the same spot in the race? Why or why not? Draw a number line to explain your answer.

Name _____ Date _____

1. Henry and Maddie were in a pie eating contest. The pies were cut either into thirds or sixths. Henry picked up a pie cut into sixths, and ate $\frac{4}{6}$ of it in 1 minute. Maddie picked up a pie cut into thirds. What fraction of pie does Maddie have to eat in 1 minute to tie with Henry? Draw a number line and use words to explain your answer.

Name _____ Date _____



1. On the number line above, use a colored pencil to divide each whole into 3 unit fractions and label each one above the line.

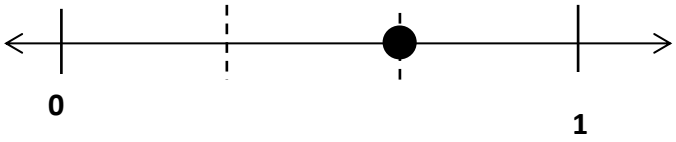
2. On the number line above, use a different colored pencil to divide each whole into 6 unit fractions and label each one.

3. Write the fractions that name the same place on the number line below.

4. Using your number line to help, name the fraction equivalent to $\frac{20}{6}$. Name the fraction equivalent to $\frac{12}{3}$. Draw the part of the number line that would include these fractions below and label it.

$$\frac{20}{6} = \frac{\quad}{3} \qquad \frac{12}{3} = \frac{\quad}{6}$$

5. Write two different fraction names for the dot on the number line. You may use halves, thirds, fourths, fifths, sixths, eighths, or tenths.



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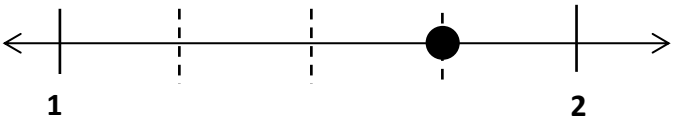

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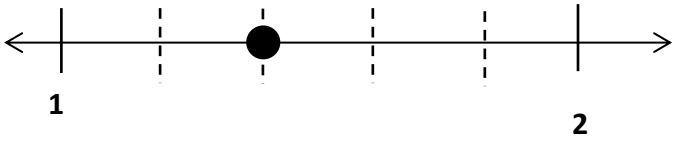

_____ = _____

6. Danielle and Mandy each ordered a large pizza for dinner. Danielle's pizza was cut into sixths, and Mandy's pizza was cut into twelfths. Danielle ate 2 sixths of her pizza. If Mandy wants to eat the same amount of pizza as Danielle, how many slices of pizza will she have to eat? Write the answer as a fraction. Draw a number line to explain your answer.