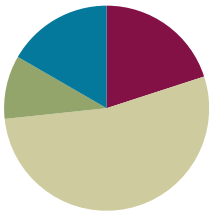
Lesson 17

Objective: Practice placing various fractions on the number line.

Related Topics: More Lesson Plans for the Common Core Math

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(6 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (12 minutes)

- Division Sprint **3.OA.2** (8 minutes)
- Place Whole Number and Unit Fractions on a Number Line **3.NF.2b** (3 minutes)
- Compare Unit Fractions **3.NF.3d** (1 minutes)

Division Sprint (8 minutes)

Materials: (S) Division Sprint

Place Whole Number and Unit Fractions on a Number Line (3 minutes)

Materials: (S) Personal white boards

T: (Draw a number line marked at 0, 1, 2, and 3.) Draw my number line on your board.
S: (Draw.)
T: Estimate to show and label 1 half within the interval 0 to 1.
S: (Estimate the halfway point between 0 and 1 and write $\frac{1}{2}$.)
T: Estimate to show 2 halves. Label 2 halves as a fraction.
S: (Write $\frac{2}{2}$ above the 1 on the number line.)

Continue with possible sequence: $\frac{4}{2}$, $\frac{6}{2}$, $\frac{1}{5}$, $\frac{5}{5}$, $\frac{10}{5}$, $\frac{15}{5}$, $\frac{1}{3}$, $\frac{3}{3}$, $\frac{9}{3}$, $\frac{6}{3}$, $\frac{1}{4}$, $\frac{8}{4}$, $\frac{12}{4}$, $\frac{4}{4}$.

Compare Unit Fractions (1 minute)

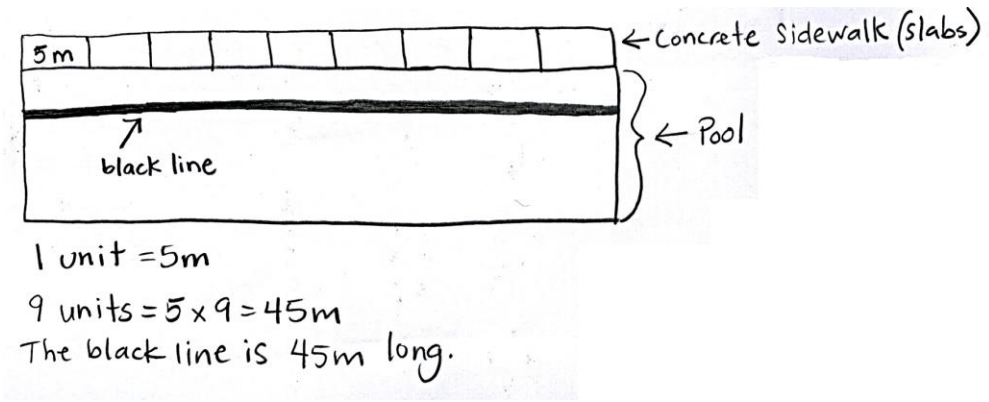
T: (Write: $\frac{1}{2}$ $\frac{1}{10}$.) Say the largest fraction.

S: 1 half.

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

Application Problem (6 minutes)

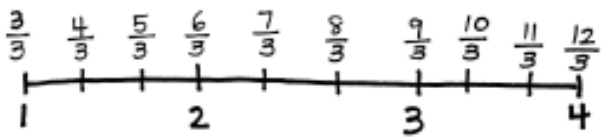
Sammy goes to the pool. She sees a black line at the bottom stretching from one end of the pool to the other. She wonders how long it is. The black line is the same length as 9 concrete slabs that make the sidewalk at the edge of the pool. One concrete slab is 5 meters long. What is the length of the black line at the bottom of the pool?



Concept Development (32 minutes)

Materials: (S) Personal white boards

T: Draw a number line with endpoints 1 and 4. Label the wholes. Partition each whole into 3 unit fractions. Label all the fractions from 1 to 4.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

To help students below grade level locate and label fractions on the number line, elicit answers that specify the whole and the unit fraction. Ask, "Point to and count the unit intervals (with me). How many wholes (unit intervals)? What unit (fraction) are we partitioning the whole into? Label as we count the unit fraction."

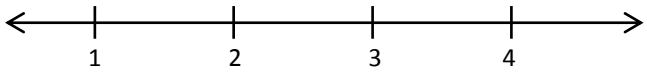
T: After you labeled your whole numbers, what did you think about to place your fractions?

S: Evenly spacing the marks between whole numbers to make 3 unit fractions. → Writing the numbers in order: 3 thirds, 4 thirds, 5 thirds, etc. → Starting with 3 thirds because the endpoint was 1.

T: What do the fractions have in common? What do you notice?

S: All the fractions have a 3 on the bottom. → All are equal to or greater than 1 whole. → The number of thirds that name whole numbers count by threes: 1 = 3 thirds, 2 = 6 thirds, 3 = 9 thirds. → $\frac{3}{3}$, $\frac{6}{3}$, $\frac{9}{3}$ and $\frac{12}{3}$ are at the same point on the number line as 1, 2, 3 and 4. Those fractions are equivalent to whole numbers.

T: Draw a number line on your board with endpoints 1 and 4.



T: (Write $\frac{2}{2}$, $\frac{5}{2}$, $\frac{7}{2}$, $\frac{8}{2}$.) Look at these fractions. What do you notice?

S: They are all halves. → They are all equal to or greater than 1. → They are in order but some are missing.

T: Place these fractions on your number line.

T: Compare with your partner. Check that your number lines are the same.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Ask students above grade level the more open-ended question: "How many unit fractions will we place on the number line?"

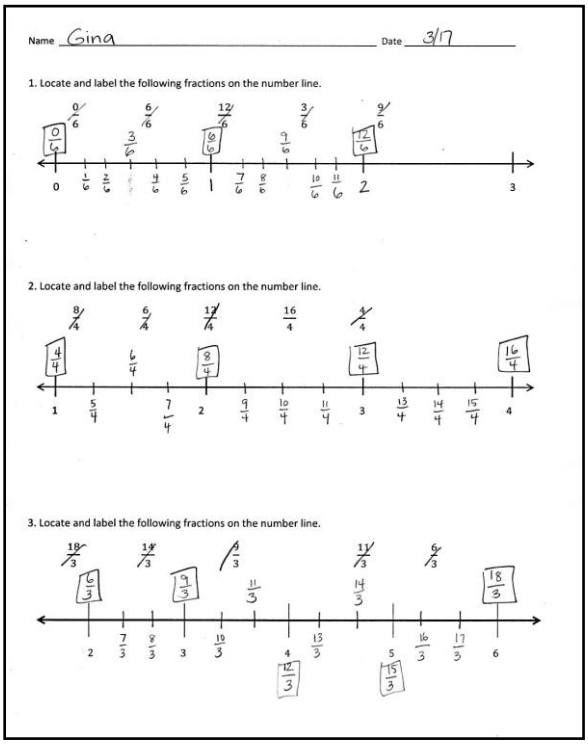
Follow a similar sequence with the following:

- Number line with endpoints 1 and 4, marking fractions in thirds
- Number line with endpoints 2 and 5, marking fractions in fifths
- Number line with endpoints 4 and 6, marking fractions in thirds (if necessary)

Close the lesson by having pairs of students generate collections of fractions to place on number lines with specified endpoints. Students might then exchange problems, challenging each other to place fractions on the number line. Students should reason aloud about how the partitioned unit fraction is chosen for each number line.

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 3/17

1. Locate and label the following fractions on the number line.

2. Locate and label the following fractions on the number line.

3. Locate and label the following fractions on the number line.

Student Debrief (10 minutes)

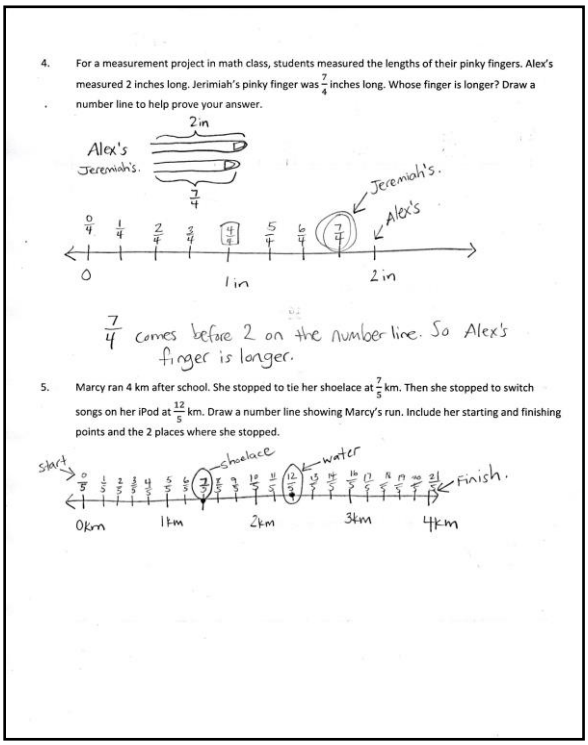
Lesson Objective: Practice placing various fractions on the number line.

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.

- What did you think about first to help you place the fractions?
- Did you label all the marks on your number line or just the fractions on the list? Why?
- What was the first fraction that you placed on your number line? Why did you start with that one?
- What advice would you give an absent classmate about completing this activity sheet? What is the most important thing to remember when placing fractions on the number line?



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.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Support ELLs as they construct written responses. Read the prompt aloud or have students read chorally. Provide sentence starters and a word bank.

Sentence starters may include:

- "I think ____ has a longer pinky finger than ____ because…."

Possible words for the word bank may include:

less than eighths closer to
greater than zero

A

Correct _____

Divide.

1	3 ÷ 3 =		23	24 ÷ 3 =	
2	4 ÷ 4 =		24	16 ÷ 2 =	
3	5 ÷ 5 =		25	30 ÷ 10 =	
4	19 ÷ 19 =		26	30 ÷ 3 =	
5	0 ÷ 1 =		27	27 ÷ 3 =	
6	0 ÷ 2 =		28	18 ÷ 2 =	
7	0 ÷ 3 =		29	40 ÷ 10 =	
8	0 ÷ 19 =		30	40 ÷ 4 =	
9	6 ÷ 3 =		31	20 ÷ 4 =	
10	9 ÷ 3 =		32	20 ÷ 5 =	
11	12 ÷ 3 =		33	24 ÷ 4 =	
12	15 ÷ 3 =		34	30 ÷ 5 =	
13	4 ÷ 2 =		35	28 ÷ 4 =	
14	6 ÷ 2 =		36	40 ÷ 5 =	
15	8 ÷ 2 =		37	32 ÷ 4 =	
16	10 ÷ 2 =		38	45 ÷ 5 =	
17	18 ÷ 3 =		39	44 ÷ 4 =	
18	12 ÷ 2 =		40	36 ÷ 4 =	
19	21 ÷ 3 =		41	48 ÷ 6 =	
20	14 ÷ 2 =		42	63 ÷ 7 =	
21	20 ÷ 10 =		43	64 ÷ 8 =	
22	20 ÷ 2 =		44	72 ÷ 9 =	

B Improvement _____ # Correct _____

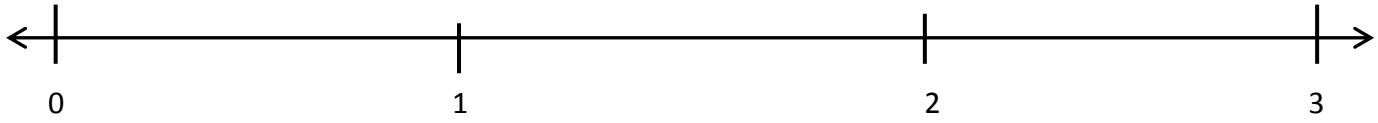
Divide.

1	2 ÷ 2 =		23	16 ÷ 2 =	
2	3 ÷ 3 =		24	24 ÷ 3 =	
3	4 ÷ 4 =		25	30 ÷ 3 =	
4	17 ÷ 17 =		26	30 ÷ 10 =	
5	0 ÷ 2 =		27	18 ÷ 2 =	
6	0 ÷ 3 =		28	27 ÷ 3 =	
7	0 ÷ 4 =		29	40 ÷ 4 =	
8	0 ÷ 17 =		30	40 ÷ 10 =	
9	4 ÷ 2 =		31	20 ÷ 5 =	
10	6 ÷ 2 =		32	20 ÷ 4 =	
11	8 ÷ 2 =		33	30 ÷ 5 =	
12	10 ÷ 2 =		34	24 ÷ 4 =	
13	6 ÷ 3 =		35	40 ÷ 5 =	
14	9 ÷ 3 =		36	28 ÷ 4 =	
15	12 ÷ 3 =		37	45 ÷ 5 =	
16	15 ÷ 3 =		38	32 ÷ 4 =	
17	12 ÷ 2 =		39	55 ÷ 5 =	
18	18 ÷ 3 =		40	36 ÷ 4 =	
19	14 ÷ 2 =		41	54 ÷ 6 =	
20	21 ÷ 3 =		42	56 ÷ 7 =	
21	20 ÷ 2 =		43	72 ÷ 8 =	
22	20 ÷ 10 =		44	63 ÷ 9 =	

Name _____ Date _____

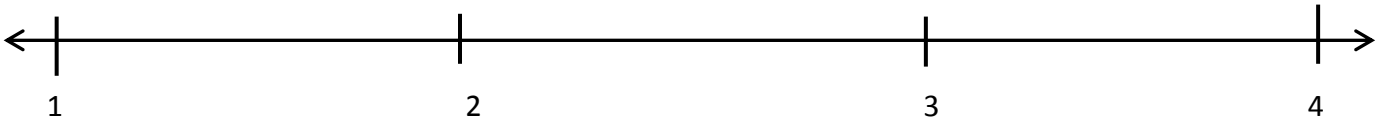
1. Locate and label the following fractions on the number line.

$\frac{0}{6}$ $\frac{6}{6}$ $\frac{12}{6}$ $\frac{3}{6}$ $\frac{9}{6}$



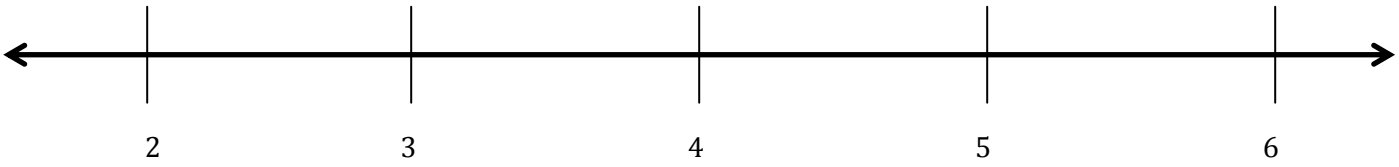
2. Locate and label the following fractions on the number line.

$\frac{8}{4}$ $\frac{6}{4}$ $\frac{12}{4}$ $\frac{16}{4}$ $\frac{4}{4}$



3. Locate and label the following fractions on the number line.

$\frac{18}{3}$ $\frac{14}{3}$ $\frac{9}{3}$ $\frac{11}{3}$ $\frac{6}{3}$



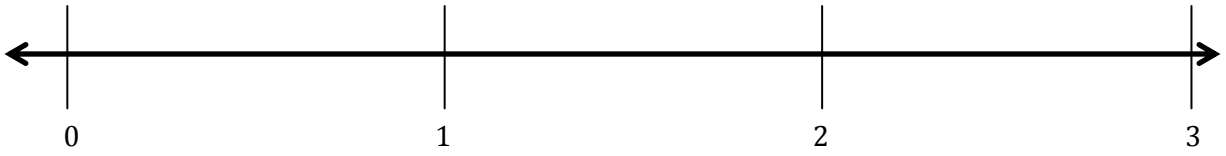
4. For a measurement project in math class, students measured the lengths of their pinky fingers. Alex's measured 2 inches long. Jerimiah's pinky finger was $\frac{7}{4}$ inches long. Whose finger is longer? Draw a number line to help prove your answer.

5. Marcy ran 4 km after school. She stopped to tie her shoelace at $\frac{7}{5}$ km. Then she stopped to switch songs on her iPod at $\frac{12}{5}$ km. Draw a number line showing Marcy's run. Include her starting and finishing points and the 2 places where she stopped.

Name _____ Date _____

1. Locate and label the following fractions on the number lines.

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

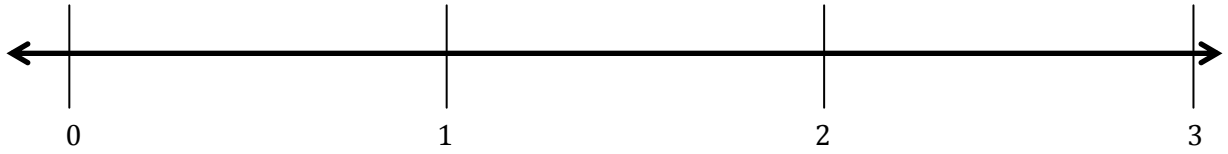


2. Katie bought 2 one-gallon bottles of juice for a party. Her guests drank $\frac{8}{4}$ gallons of juice. What fraction of juice didn't they drink? Draw a number line to show and explain your answer.

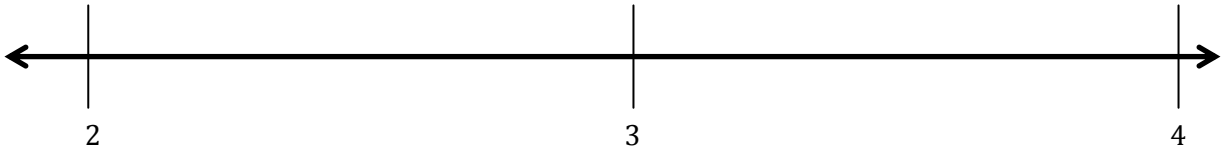
Name _____ Date _____

Locate and label the following fractions on the number lines.

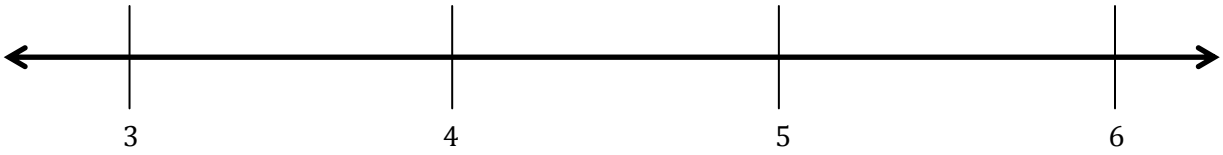
1. $\frac{1}{2}$ $\frac{4}{2}$ $\frac{5}{2}$



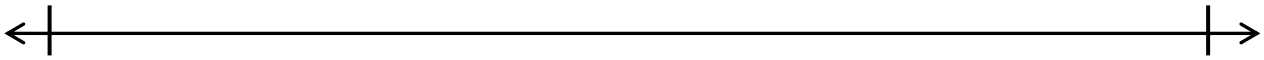
2. $\frac{11}{3}$ $\frac{6}{3}$ $\frac{8}{3}$



3. $\frac{20}{4}$ $\frac{13}{4}$ $\frac{23}{4}$



4. Wayne went on a 4 km hike. He took a break at $\frac{4}{3}$ km. He took a drink of water at $\frac{10}{3}$ km. Show Wayne's hike on the number line. Include his starting and finishing place, and the 2 points where he stopped.



5. Ali wants to buy a piano. The piano measures $\frac{19}{4}$ ft. long. She has a space 5 ft. long for the piano in her house. Does she have enough room? Draw a number line to show and explain your answer.