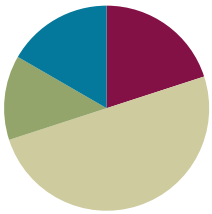
Lesson 25

Objective: Express whole number fractions on the number line when the unit interval is 1.

Related Topics: More Lesson Plans for the Common Core Math

Suggested Lesson Structure

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



Fluency Practice (12 minutes)

- Sprint: Subtract by 6 **2.NBT.5** (8 minutes)
- Express Whole Numbers as Different Fractions **3.NF.3c** (4 minutes)

Sprint: Subtract by 6 (8 minutes)

Materials: (S) Subtract by 6 Sprint

Express Whole Numbers as Different Fractions (4 minutes)

Materials: (S) Personal white boards

T: (Project number line from 0-4. Below the 0 write $0 = \frac{}{5}$.) 0 is how many fifths?

S: 0 fifths. (Write $\frac{0}{5}$ below the 0 on the number line.)

T: Below the 1 write $1 = \frac{}{5}$.) 1 is how many fifths?

S: 5 fifths. (Write $\frac{5}{5}$ below the 1 on the number line.)

T: (Below the 2, write $2 = \frac{}{5}$.) On your boards, fill-in the number sentence.

S: (Write $2 = \frac{10}{5}$.)

T: (Write $\frac{10}{5}$ below the 2 on the number line.)

T: (Write $3 = \frac{}{5}$.) On your boards, fill in the number sentence.

S: (Write $3 = \frac{15}{5}$.)

T: (Write $\frac{15}{5}$ below the 3 on the number line.)

T: (Write $4 = \frac{\ }{5}$.) On your boards, fill in the number sentence.

S: (Write $4 = \frac{20}{5}$.)

T: (Write $\frac{20}{5}$ below the 4 on the number line.)

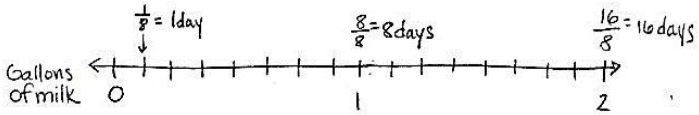
Continue the process for fourths.

Application Problem (8 minutes)

Linc drinks 1 eighth gallon of milk every morning.

a. How many days would it take for him to drink 1 gallon of milk? Use a number line and words to explain your answer.

b. How many days would it take him to drink 2 gallons? Extend your number line to show 2 gallons and use words to explain your answer.



a) It will take 8 days to drink 1 gallon of milk because he drinks $\frac{1}{8}$ gallons of milk a day, and there are 8 eighths in a gallon.

b) 16 days because there are 16 eighths in 2 gallons.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Scaffold the Application Problem for students below grade level with step-by-step questioning. Ask (for example),

- What is the unit fraction?
- Name the unit that we are partitioning.
- Count by eighths to reach 1 whole, labeling the number line as you count.
- How many eighths in 1 gallon?
- How many days will it take to drink 1 gallon?
- Count by eighths to reach 2 wholes labeling the number line as you count.
- How many days will it take to drink 2 gallons?

Concept Development (30 minutes)

Materials: (S) Lesson 25 template, personal white boards

(Students slip the double-sided template into personal white boards and begin on Side A.)

T: Each rectangle represents 1 whole. Partition the first rectangle into thirds. Write the whole as a fraction below it.

S: (Partition and label with $\frac{3}{3}$.)

T: $\frac{3}{3}$ is equivalent to?

S: 1 whole!

T: Add that to your paper.

S: (Write: $\frac{3}{3} = 1$ whole.)

T: Now partition the second rectangle into halves. Label the whole as a fraction below it.

S: (Partition and label with $\frac{2}{2}$.)

T: $\frac{2}{2}$ is equivalent to?

S: 1 whole!

T: Add that to your paper.

S: (Write: $\frac{2}{2} = 1$ whole.)

T: Now partition the third rectangle into wholes.

S: What do you mean? It is already a whole. → That means 0 partitions!

T: Talk with your partner about how we label this whole as a fraction.

S: 1. → That's not a fraction! It's $\frac{0}{1}$ because there are no parts. → No, it's $\frac{1}{0}$ because we didn't partition. → There's a pattern of the same number on the top and bottom for whole number fractions. So maybe this is $\frac{1}{1}$?

T: I hear some students noticing the pattern that whole number fractions have the same values on the top and bottom; therefore, an equivalent way of writing 1 whole as a fraction is to write it as $\frac{1}{1}$. We started with 1 whole. We didn't split it into more parts, so the whole is still in 1 piece, and we're counting that 1 piece.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students above grade level will love this discussion towards discovery. Guide students to respectfully respond to peers with sentence starters, such as, "That's an idea. I have a different way of seeing it. I think ….because…." or "I see what you're saying however…."

T: Let's look at the equivalent fractions we've written for 1 on the number line. At the bottom of your template, mark each of the 3 number lines with end points 0 and 1 above the line.

S: (Students mark end points.)

T: Show each rectangle on a different number line. Be sure to partition, label, and rename the wholes below the line.

S: (Students partition and label number lines. Teacher circulates to observe.)

T: What do you notice about the relationship between the partitioning on the rectangles and the number lines?

S: It's the same. → It goes 2 partitions, 1 partition, no partitions on the last number line!

T: Right, and since we didn't partition because the unit is 1 whole, on the last number line we renamed the whole?

S: $\frac{1}{1}$!

T: Flip your personal board over to Side B. Each rectangle represents 1 whole. How many wholes are in each model?

S: 2 wholes.

T: Let's partition Model 1 into thirds, Model 2 into halves, and Model 3 into wholes. Use Side A to help you if you need it.

S: (Students partition.)

T: Now work with your partner to label each model.

S: (Label Model 1: $\frac{6}{3} = 2$. Model 2: $\frac{4}{2} = 2$. Students may or may not label model 3 correctly: $\frac{2}{1} = 2$.)

T: Let's take a look at how you labeled Model 3. How did you partition the model?

S: There are no partitions because they're both wholes.

T: How many copies of 1 whole does the model have?

S: 2 copies of 1 whole.

T: The top number shows us the amount of copies, and the bottom number tells us the unit. So for model 3 we write the whole as $\frac{2}{1}$.

T: Let's use our number lines again with these models. Label the endpoints on each number line 0 and 2.

Guide students through a similar sequence to the number line work they did on Side A.

T: I'd like you to circle $\frac{2}{2}$ on your second number line. Now compare it to where you labeled $\frac{2}{1}$ on your third number line. Tell your partner the difference between $\frac{2}{1}$ and $\frac{2}{2}$.

S: $\frac{2}{2}$ means it's only 1 whole. There are 2 copies, and the unit is halves. → $\frac{2}{1}$ means there are 2 wholes, and the unit of each is 1 whole. → $\frac{2}{1}$ is much larger than $\frac{2}{2}$. It's another whole! You can see that right there on the number line.

If necessary, have students do a similar sequence with fourths.

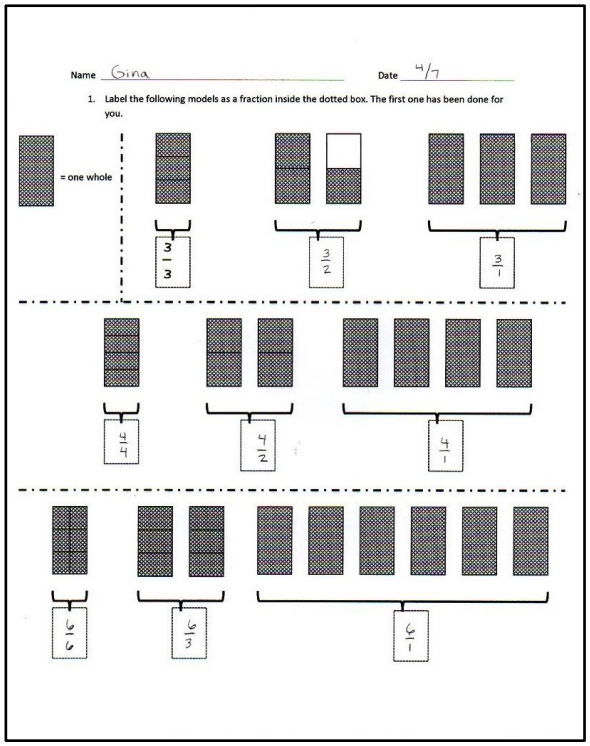
Note: This template is used again in Lesson 27 and Lesson 29. You may want to collect these templates or have your students store it in a safe place for later use.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

For ELLs, increase wait time, speak clearly, use gestures, and make eye-contact. When giving instructions for partitioning the 3 Models, pause more frequently and check for understanding.

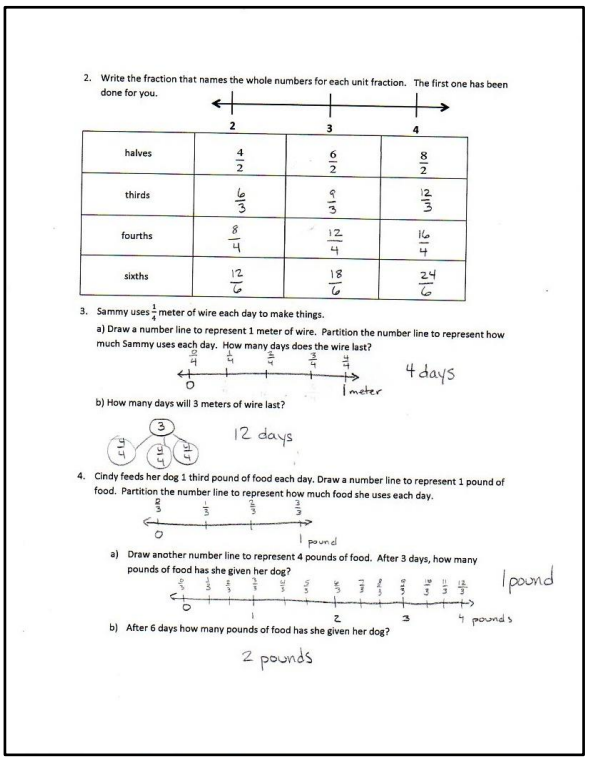
Problem Set (10 minutes)

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 4/7

1. Label the following models as a fraction inside the dotted box. The first one has been done for you.

= one whole


2. Write the fraction that names the whole numbers for each unit fraction. The first one has been done for you.

halves	$\frac{4}{2}$	$\frac{6}{2}$	$\frac{8}{2}$
thirds	$\frac{6}{3}$	$\frac{9}{3}$	$\frac{12}{3}$
fourths	$\frac{8}{4}$	$\frac{12}{4}$	$\frac{16}{4}$
sixths	$\frac{12}{6}$	$\frac{18}{6}$	$\frac{24}{6}$

3. Sammy uses $\frac{1}{4}$ meter of wire each day to make things.
a) Draw a number line to represent 1 meter of wire. Partition the number line to represent how much Sammy uses each day. How many days does the wire last? 4 days
b) How many days will 3 meters of wire last? 12 days

4. Cindy feeds her dog 1 third pound of food each day. Draw a number line to represent 1 pound of food. Partition the number line to represent how much food she uses each day.
a) Draw another number line to represent 4 pounds of food. After 3 days, how many pounds of food has she given her dog? 1 pound
b) After 6 days how many pounds of food has she given her dog? 2 pounds

Student Debrief (10 minutes)

Lesson Objective: Express whole number fractions on the number line when the unit interval is 1.

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 1 presents a slightly different sequence than the lesson. Invite students to share what they notice about the relationship between the models in Problem 1. You might ask them to relate their work on that question to the guided practice in the lesson.
- Engage students in a conversation that gets them to articulate the difference between $\frac{2}{1}$ and $\frac{2}{2}$. To solidify their understanding, ask them to apply their thinking to different fractions like $\frac{3}{1}$ and $\frac{3}{3}$. You may want to use a number line during this portion of the discussion to help students notice that the difference between these fractions is even greater and continues to grow as the numbers go higher.

- Have students practice and articulate the lesson objective by closing with a series of pictures you quickly draw on the board. For example, you might make 10 circles. Then say:

  T: If each circle is 1 whole, how might you write the fraction for my total number of wholes?

  S: $\frac{10}{1}$!

  T: Explain to your partner how you know.

  S: (Articulate their understanding from the lesson.)

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.

A

Correct _____

Subtract.

1	16 - 6 =		23	23 - 6 =	
2	6 - 6 =		24	33 - 6 =	
3	26 - 6 =		25	63 - 6 =	
4	7 - 6 =		26	83 - 6 =	
5	17 - 6 =		27	14 - 6 =	
6	37 - 6 =		28	24 - 6 =	
7	8 - 6 =		29	34 - 6 =	
8	18 - 6 =		30	74 - 6 =	
9	48 - 6 =		31	54 - 6 =	
10	9 - 6 =		32	15 - 6 =	
11	19 - 6 =		33	25 - 6 =	
12	59 - 6 =		34	35 - 6 =	
13	10 - 6 =		35	85 - 6 =	
14	20 - 6 =		36	65 - 6 =	
15	70 - 6 =		37	90 - 6 =	
16	11 - 6 =		38	53 - 6 =	
17	21 - 6 =		39	42 - 6 =	
18	81 - 6 =		40	71 - 6 =	
19	12 - 6 =		41	74 - 6 =	
20	22 - 6 =		42	95 - 6 =	
21	82 - 6 =		43	51 - 6 =	
22	13 - 6 =		44	92 - 6 =	

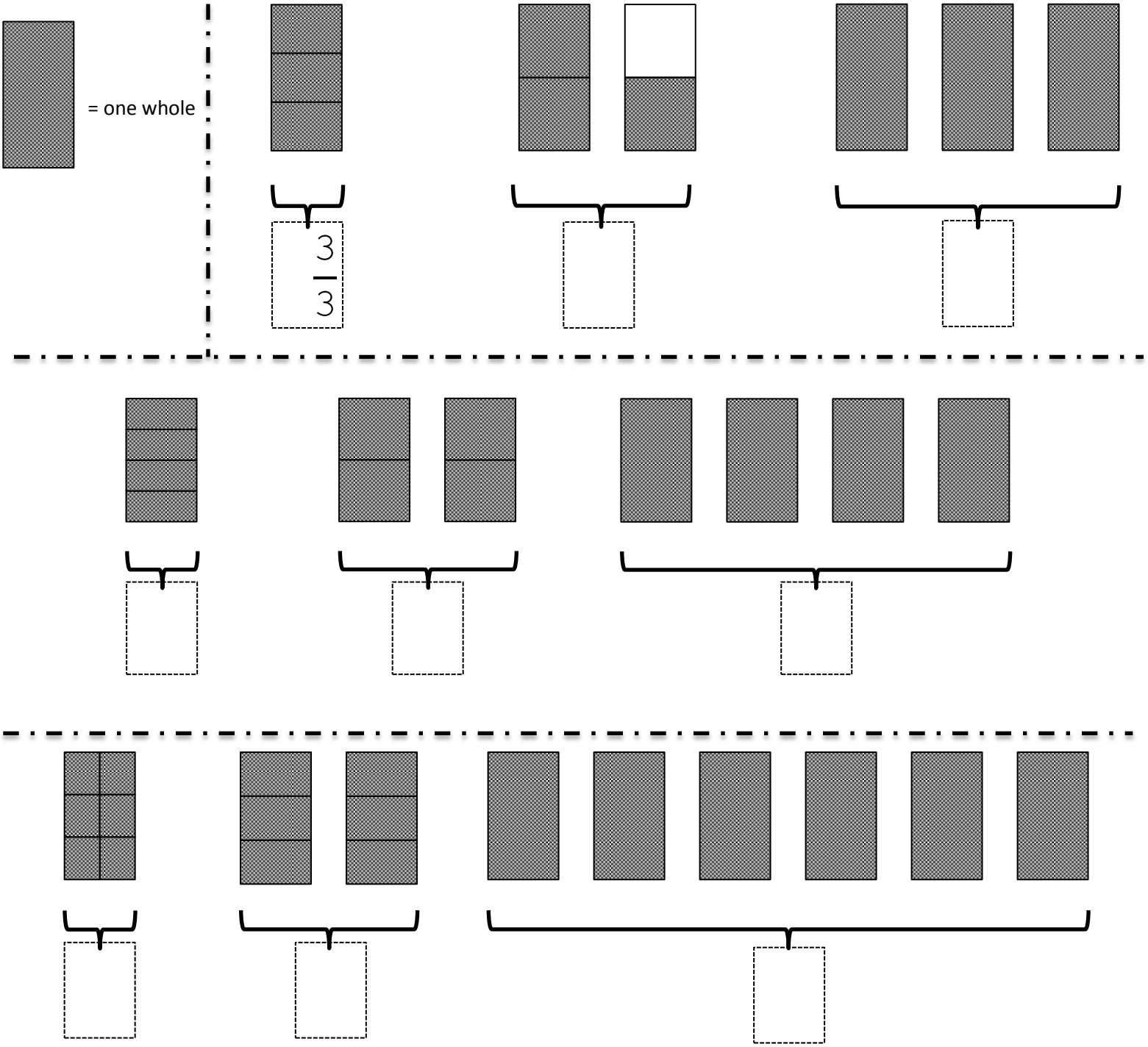
B Improvement _____ # Correct _____

Subtract.

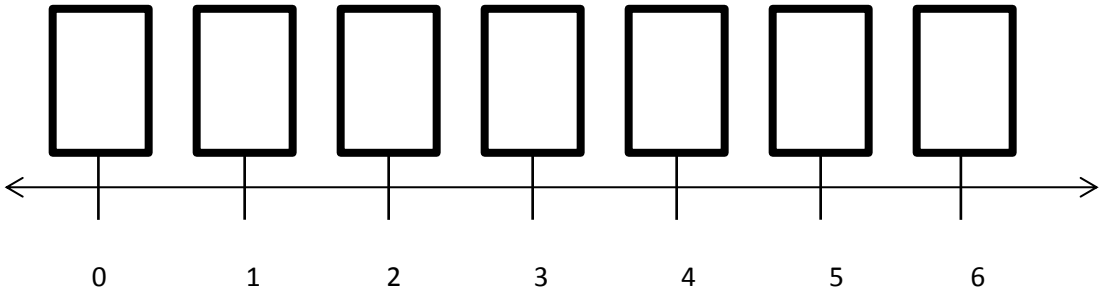
1	6 - 6 =		23	23 - 6 =	
2	16 - 6 =		24	33 - 6 =	
3	26 - 6 =		25	53 - 6 =	
4	7 - 6 =		26	73 - 6 =	
5	17 - 6 =		27	14 - 6 =	
6	67 - 6 =		28	24 - 6 =	
7	8 - 6 =		29	34 - 6 =	
8	18 - 6 =		30	64 - 6 =	
9	78 - 6 =		31	44 - 6 =	
10	9 - 6 =		32	15 - 6 =	
11	19 - 6 =		33	25 - 6 =	
12	89 - 6 =		34	35 - 6 =	
13	10 - 6 =		35	75 - 6 =	
14	20 - 6 =		36	55 - 6 =	
15	90 - 6 =		37	70 - 6 =	
16	11 - 6 =		38	63 - 6 =	
17	21 - 6 =		39	52 - 6 =	
18	41 - 6 =		40	81 - 6 =	
19	12 - 6 =		41	64 - 6 =	
20	22 - 6 =		42	85 - 6 =	
21	42 - 6 =		43	91 - 6 =	
22	13 - 6 =		44	52 - 6 =	

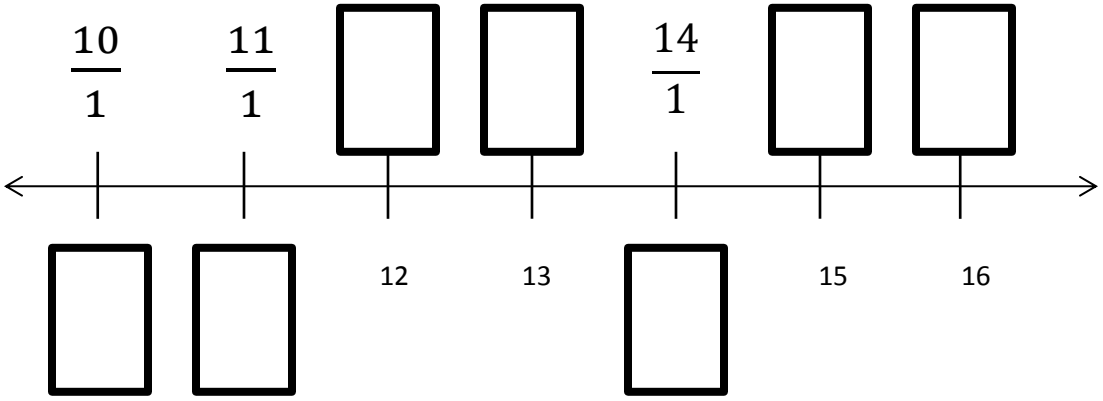
Name _____ Date _____

1. Label the following models as a fraction inside the dotted box. The first one has been done for you.



2. Label the number lines with fractions representing whole numbers on top, and whole numbers beneath.



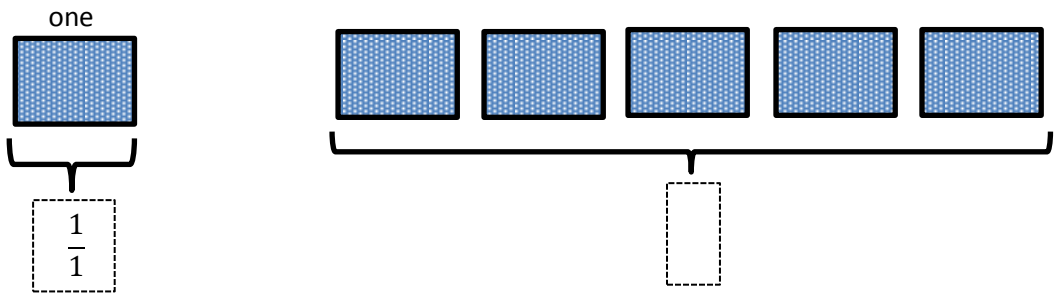


3. Explain in words and pictures the difference between these two fractions.

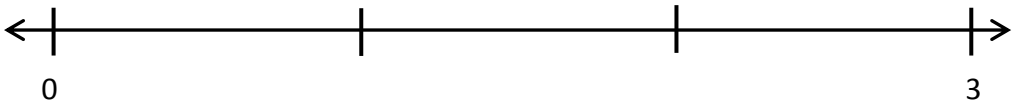
$\frac{2}{1}$ $\frac{2}{2}$

Name _____ Date _____

1. Label the following models as fractions inside the boxes.

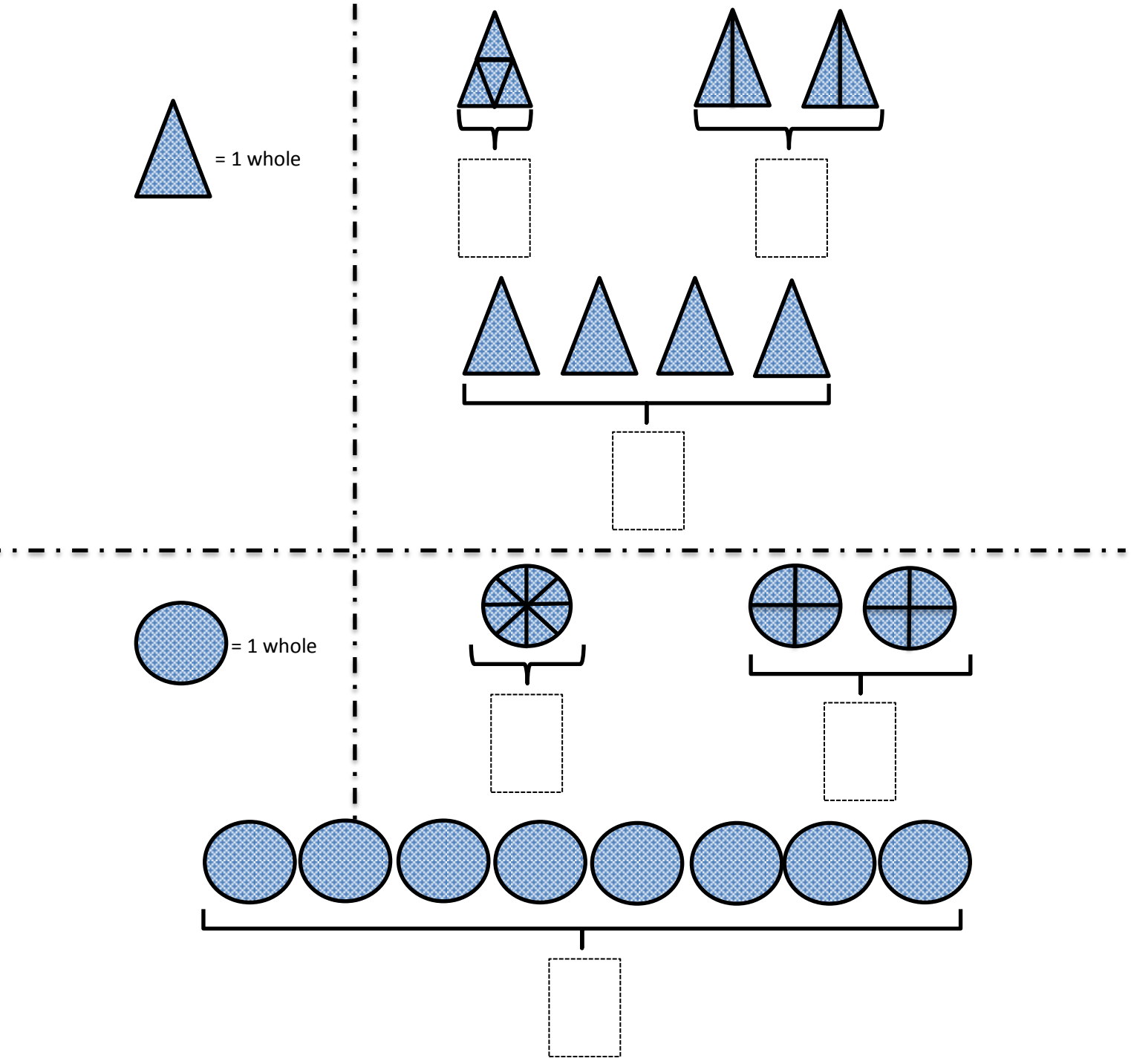


2. Parition the number line into thirds. Rename the fraction for 3 wholes. Use the number line and words to explain your answer.

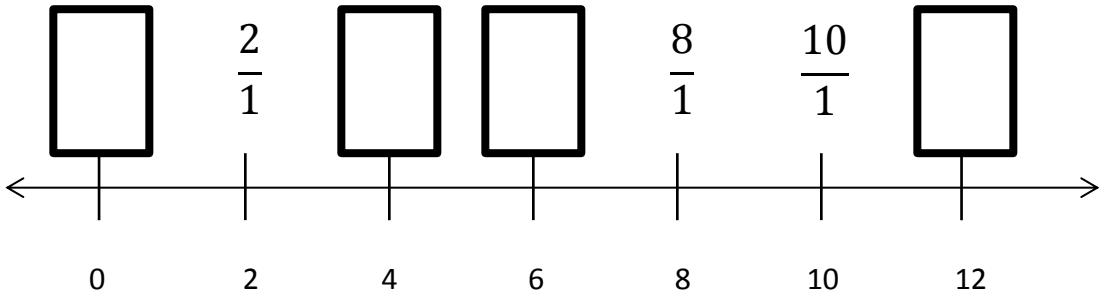


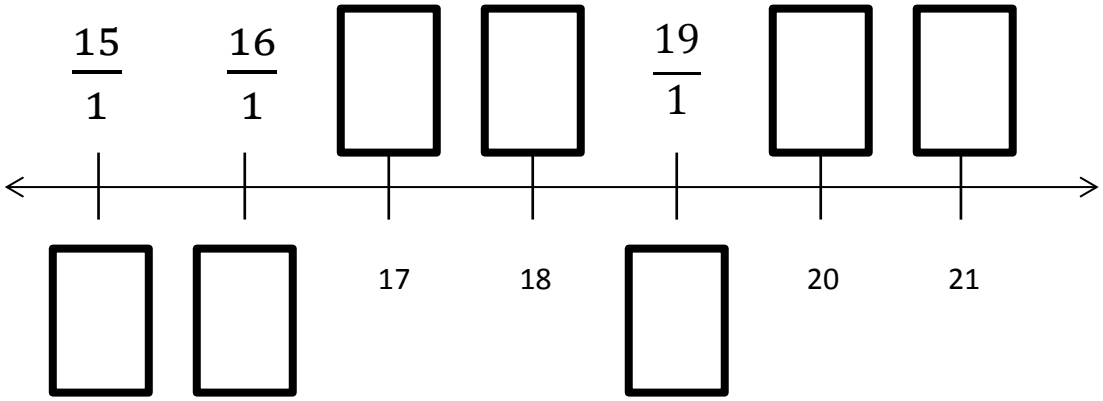
Name _____ Date _____

1. Label the following models as a fraction inside the boxes.



2. Fill in missing whole numbers. Then rename the wholes in the boxes.





3. Explain the difference between these fractions using a number line, pictorial model, or words.

$\frac{5}{1}$ $\frac{5}{5}$