Eureka Math

4th Grade
Module 6
Lesson 6

At the request of elementary teachers, a team of Bethel & Sumner educators met as a committee to create Eureka slideshow presentations. These presentations are not meant as a script, nor are they required to be used. Please customize as needed. Thank you to the many educators who contributed to this project!

Directions for customizing presentations are available on the next slide.

Icons

Read, Draw, Write

Learning Target

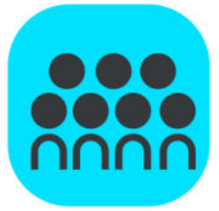
Personal White Board

Problem Set

Manipulatives Needed

Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

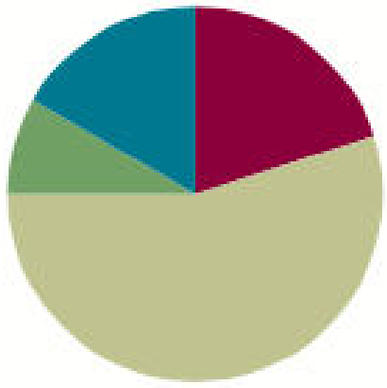
Small Group Time

Lesson 6

Objective: Use the area model and number line to represent mixed numbers with units of ones, tenths, and hundredths in fraction and decimal forms.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(5 minutes)
Concept Development	(33 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Use the area model and number line to represent mixed numbers with units of one, tenths, and hundredths in fraction and decimal form.

Count by Hundredths

- Count by fives to 30, starting at zero.
- Count by 5 hundredths to 30 hundredths, starting at 0 hundredths

$$\frac{0}{100} \quad \frac{5}{100} \quad \frac{10}{100} \quad \frac{15}{100} \quad \frac{20}{100} \quad \frac{25}{100} \quad \frac{30}{100}$$

$$\frac{0}{10} \quad \frac{1}{10} \quad \frac{2}{10} \quad \frac{3}{10}$$

- 1 tenth is the same as how many hundredths?
- Continue for 2/10 and 3/10.
- Count by 5 hundredths again. This time, when you come to a tenth, say the tenth.

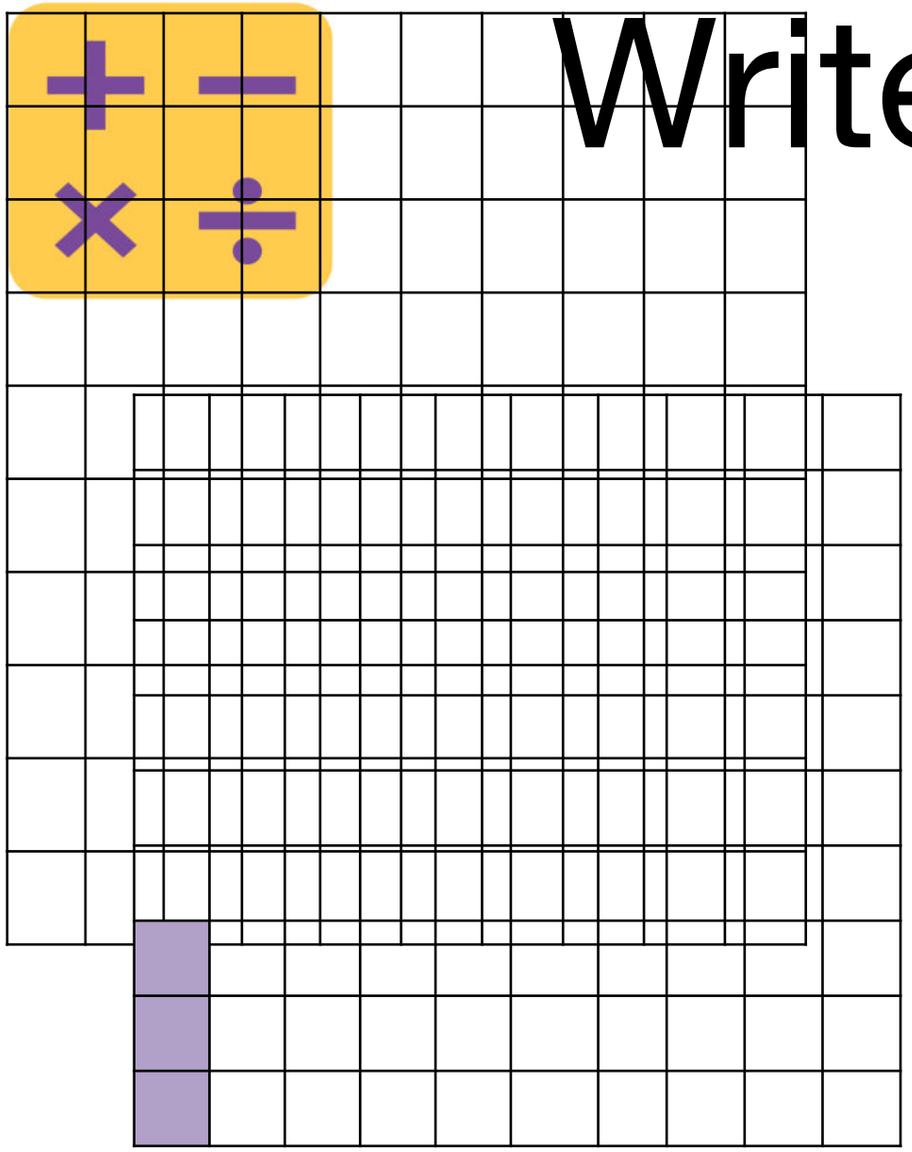
Count by Hundredths

$\frac{0}{100}$	$\frac{5}{100}$	$\frac{10}{100}$	$\frac{15}{100}$	$\frac{20}{100}$	$\frac{25}{100}$	$\frac{30}{100}$
$\frac{0}{10}$		$\frac{1}{10}$		$\frac{2}{10}$		$\frac{3}{10}$

- Count backwards by 5 hundredths, starting at 3 tenths.
- Count by 5 hundredths again. When I raise my hand, STOP.
- Say 15 hundredths using digits *zero point one five*

- Continue counting
- Say 3 tenths using digits. *zero point three*
- Count backwards by 5 hundredths starting at 3 tenths.
- Stop. Say 25 hundredths using digits. *zero point two five*

Write the Decimal or Fraction



1 whole is decomposed into 100 equal units. Write the fraction of the grid that is shaded. Write the matching decimal.

$$\frac{3}{100} = \underline{0}\,.\underline{03}$$

Continue the process for $\frac{5}{100}$, $\frac{8}{100}$, $\frac{4}{100}$, and $\frac{14}{100}$

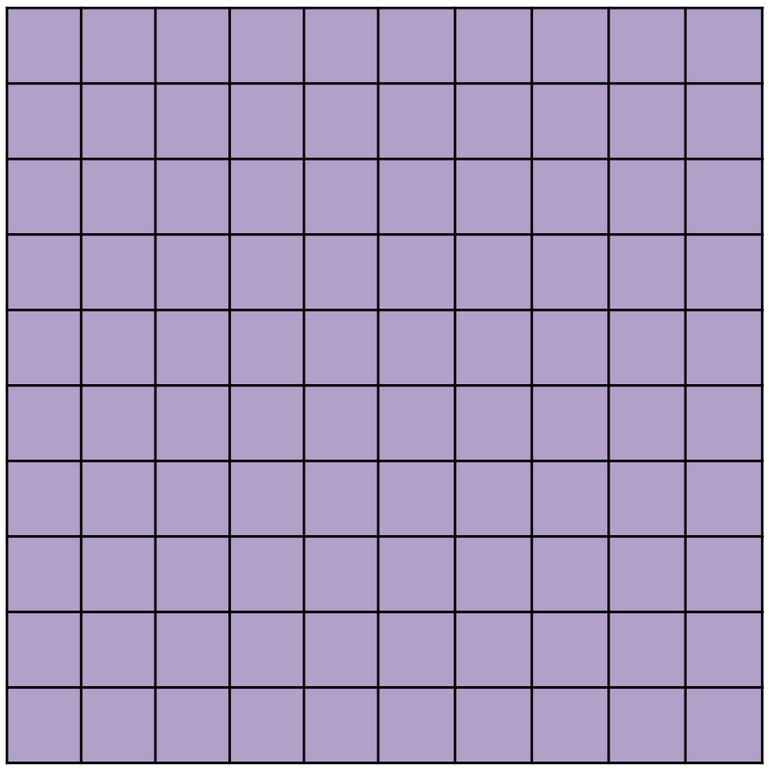
Complete the number sentence.

$$\frac{14}{100} = \frac{10}{100} + \frac{4}{100} = 0.14$$

Write the Decimal or Fraction

Continue the process for $\frac{17}{100}$ and $\frac{53}{100}$

Continue the process for 0.14, 0.06, and 0.16



Write the amount of the grid that's shaded as a fraction and as a digit.

$$\frac{100}{100} = 1$$

Break Apart Hundredths

ones	tenths	hundredths
		○ ○ ○ ○ ○
		○ ○ ○ ○ ○
		○ ○ ○

Say the value. *13 hundredths*

Write the value of the disks as a decimal. *0.13*

Write 13 hundredths as a fraction. *13/100 = 0.13*

How many hundredths are in 1 tenth? *10*

Draw place value disks to represent the 13 hundredths after composing 1 tenth.

Complete the number sentence. $0.13 = \frac{13}{100} = \frac{\quad}{10} + \frac{\quad}{100}$

Application Problem

The table shows the perimeter of four rectangles.

a. Which rectangle has the smallest perimeter?
b. The perimeter of Rectangle C is how many meters less than a kilometer?
c. Compare the perimeters of Rectangles B and D. Which rectangle has the greater perimeter? How much greater?

Rectangle	Perimeter
A	54 cm
B	$\frac{69}{100}$ m
C	54 m
D	0.8 m

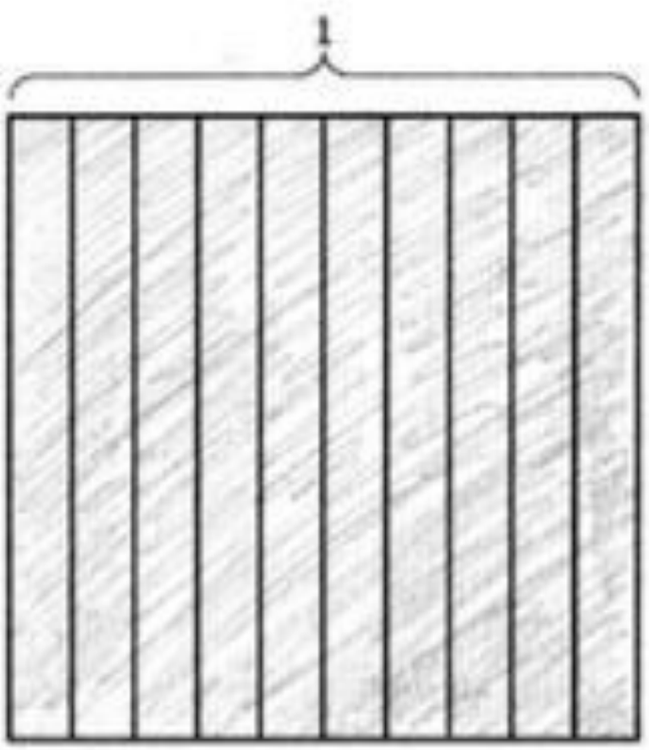
Represent mixed numbers with units of ones, tenths, and hundredths using area models.

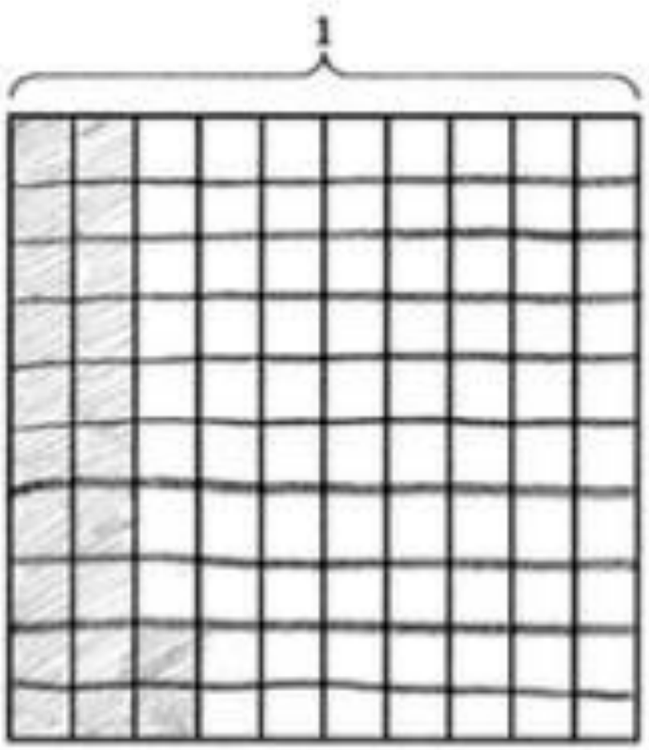
$1\frac{22}{100}$

How many ones?

How many hundredths more than 1?

Use your Template 1 (area model) to shade $1\frac{22}{100}$





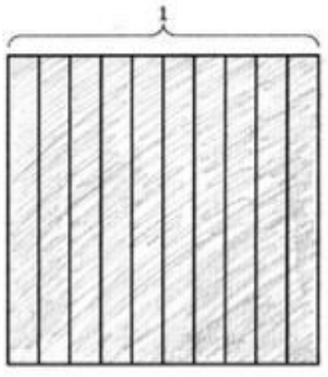
How many ones are shaded?

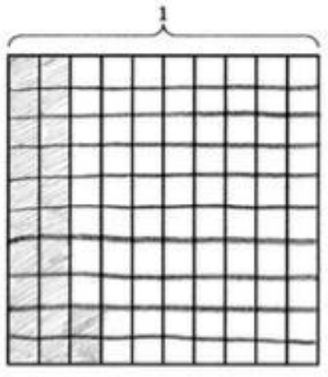
What fraction of another one is shaded?

Write in decimal form

$$1\frac{22}{100} = 1.22$$

Represent mixed numbers with units of ones, tenths, and hundredths on a number line.





We have used tape diagrams, area models, and place value disks to represent decimal numbers. We can also use a number line.

Using Template 2 (number line), label the intervals of 0, 1, 2.

We start with the largest unit. What is the largest unit? *ones*

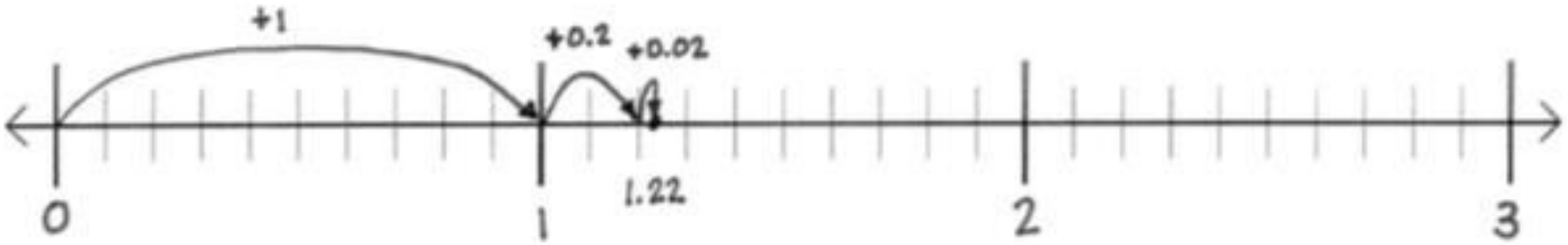
Start at zero, and slide 1 one. What is remaining? *22 hundredths*

What is the next largest unit? *tenths*

How many tenths? Start at 1 one and slide 2 tenths.

What remains? How do we show hundredths?

Represent mixed numbers with units of ones, tenths, and hundredths on a number line.



Let's estimate where the hundredths would be. We need to show 2 hundredths. If I imagine each tenth partitioned into ten parts, where would 2 hundredths be? I will move very slowly. Say, "Stop!" when I get to 1 and 22 hundredths.

Draw an arrow to show this very small slide. Discuss with a partner. How did we move from zero to 1.22?

Let's locate $3\frac{46}{100}$ on the next number line.

Can we label the intervals the same?

Match the unit form of a mixed number to its decimal and fraction forms.

When we write decimal numbers, the decimal point separates the whole number part on the left from the decimal fraction part on the right.

Write 3 ones 8 tenths as a decimal.

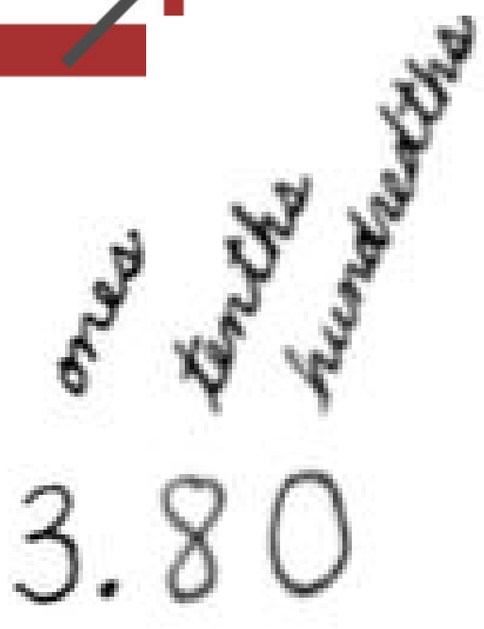
ones tenths

The ones and the tenths each have a special place. 3.8

Write 3 ones 8 hundredths in decimal form. Show your partner what you have written. Are your answers the same?

ones tenths hundredths

3.08



Match the unit form of a mixed number to its decimal and fraction forms.

Look again at 3 ones 8 tenths.
Place a zero to the right of the digit eight.
Say that number in unit form.

3 ones 80 hundredths

Express 80 hundredths as tenths. *8 tenths*

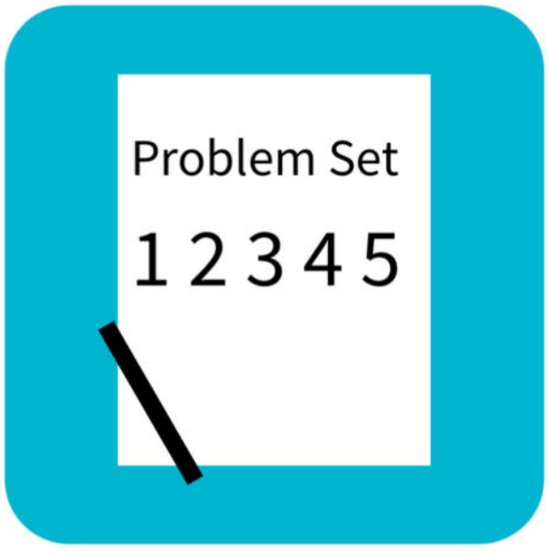
Yes, 0.80 and 0.8 are equivalent. We've shown this using an area model and using division, too, when the number was in fraction form.

Match the unit form of a mixed number to its decimal and fraction forms.

Let's practice writing fractions and decimals. Be mindful of each digit's place in the number.

Write 2 ones 8 hundredths as a mixed number and then as a decimal number.

$2\frac{8}{100}$, 2.08

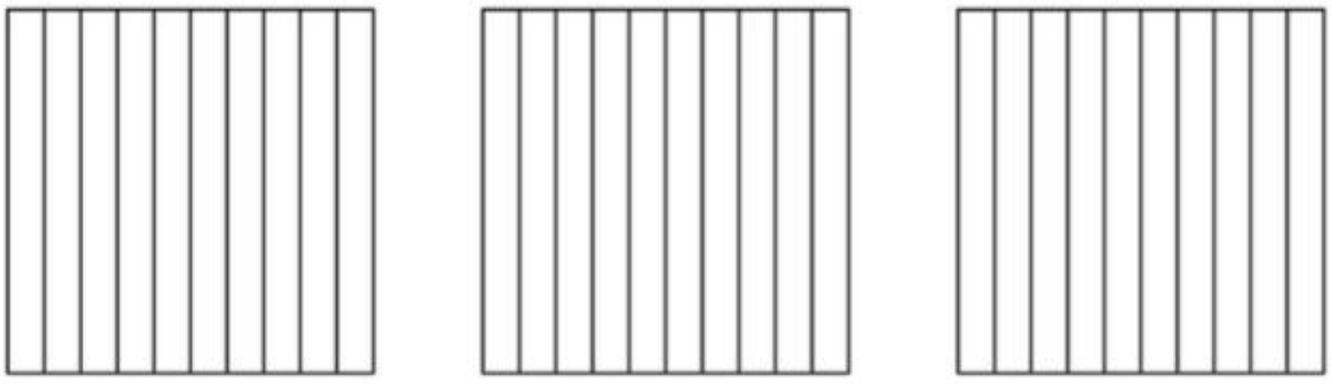


Problem Set

Name _____ Date _____

1. Shade the area models to represent the number, drawing horizontal lines to make hundredths as needed. Locate the corresponding point on the number line. Label with a point, and record the mixed number as a decimal.

a. $1\frac{15}{100}$ = ___.____



Debrief

- How could you count backward to locate 2.47 on the number line in Problem 1(b)?
- In Problem 2(a), how did you estimate the location of your point?
- In Problem 3(a), the units are ones and hundredths. If I had 1.02 liters of water and you had 1.02 kilograms of rice, how do the measurement units change the meaning of that number?
- In Problem 3(f), express this number in ones and tenths. Use a model to show that this new representation is equivalent to 7 ones 70 hundredths.

Debrief

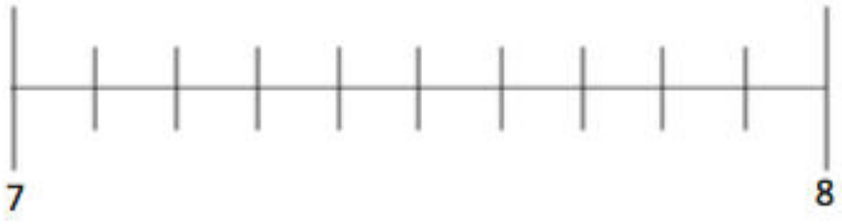
- Simplify $7\frac{70}{100}$ using division to show it is equal to $7\frac{7}{10}$. Explain to your partner how that relates to $7.70 = 7.7$.
- Explain to your partner why there is one less item in the left and right columns of Problem 4 than in the center column.
- Compare. (Write 1.4 meters _____ 1.7 grams.) Does it make sense to compare meters with grams? Why not?
- Talk with your partner about the importance of the number zero. Use the number 100 and the number 0.01 in your discussion. (Provide Hide Zero cards to strengthen the conversation.)

Exit Ticket

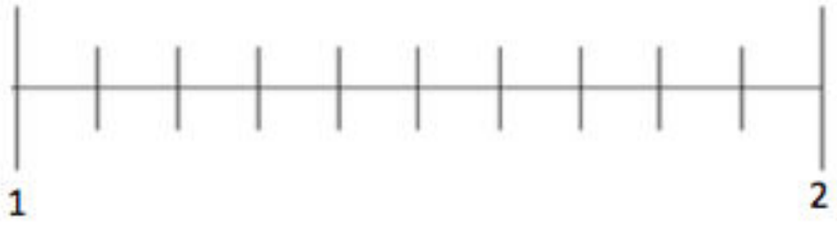
Name _____ Date _____

1. Estimate to locate the points on the number lines. Mark the point, and label it as a decimal.

a. $7\frac{20}{100}$



b. $1\frac{75}{100}$



2. Write the equivalent fraction and decimal for each number.

a. 8 ones 24 hundredths

b. 2 ones 6 hundredths