

Module 4 - Lesson 22:

Divide decimal numbers to hundredths by two-digit whole numbers.

CCSS Standard – 5.NBT.B.7

FLUENCY (10-min)

Whiteboard Exchange: Multiply Multi-Digit Whole Numbers.



Write and complete the equation by using the standard algorithm.

$$23 \times 312 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 312 \\ \times 23 \\ \hline \end{array}$$

$$42 \times 419 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 419 \\ \times 42 \\ \hline \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

3.319

What is the **value** of the **red** underline digit?

3.

0.3

Write and complete the equations to show the relationship between the values of the underlined digits.

$$\underline{3.} = 10 \times \underline{0.3}$$

$$\underline{0.3} = \frac{1}{10} \times \underline{3.}$$

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

What is the **value** of the **red** underline digit?

7.**8****8**5
0.**8**
0.**08**

Write and complete the equations to show the relationship between the values of the underlined digits.

$$\underline{0.8} = 10 \times \underline{0.08}$$

$$\underline{0.08} = \frac{1}{10} \times \underline{0.8}$$

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

24.**4**02

What is the **value** of the **red** underline digit?

4.**0**

0.**4**

Write and complete the equations to show the relationship between the values of the underlined digits.

$$\underline{4.0} = 10 \times \underline{0.4}$$

$$\underline{0.4} = \frac{1}{10} \times \underline{4.0}$$

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

91.577

What is the **value** of the **red** underline digit?

0.07
0.007

Write and complete the equations to show the relationship between the values of the underlined digits.

$$\underline{0.07} = 10 \times \underline{0.007}$$

$$\underline{0.007} = \frac{1}{10} \times \underline{0.07}$$

LAUNCH (10-min)

LEARN book page 205.

Task: Take 3-minutes to complete part A silently.

Hints:
 $38 \times \underline{\hspace{1cm}}$ ones = 228 ones.
 $38 \times \underline{\hspace{1cm}}$ tenths = 152 tenths
 38×3 hundredths = $\underline{\hspace{1cm}}$ hundredths

$$\begin{array}{r} 38 \overline{) 228} \\ 38 \overline{) 152} \end{array}$$

Complete an area model representing a multiplicative relationship between a decimal number and a two-digit whole number.

$$\begin{array}{r} 1 \\ 228. \\ 15.2 \\ + 1.14 \\ \hline 244.34 \end{array}$$

1. Consider the area model.

a. Complete the area model.

	<u>6</u>	<u>4 tenths</u>	3 hundredths
38	228 ones	152 tenths	<u>114</u> hundredths

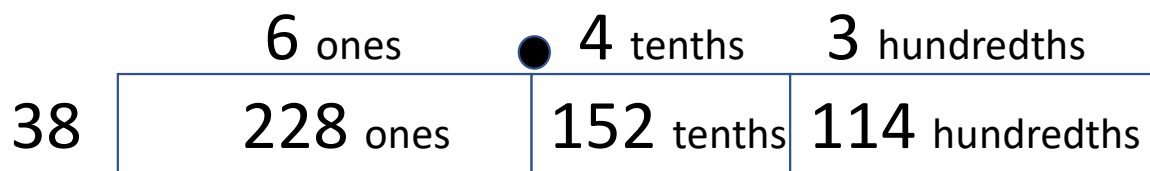
b. Complete the multiplication and division equations that are represented by the area model.
Use standard form.

$$\begin{array}{r} \underline{6.43} \times 38 = \underline{244.34} \\ \underline{244.34} \div 38 = \underline{6.43} \end{array}$$

LAUNCH (10-min)

Complete an area model representing a multiplicative relationship between a decimal number and a two-digit whole number.

LEARN book page 205.



$$38 \overline{) 244.38}$$

Take-Away: The area model can help us find $244.34 \div 38$. We can find the unknown side length of each part. The total of these side lengths is equal to the quotient.

It would not be efficient to use a place value chart to find the quotient. That would require us to draw 38 groups and distribute dots into that many groups. The vertical form would be most efficient.

Today, we will use the division methods we already know to **divide decimal numbers by two-digit whole numbers**.

LEARN (30-min)

Equal Groups Word Problem

LEARN book page 206.

Use the Read–Draw–Write process to solve each problem.

2. A gardener has 249.6 kg of grass seed. She makes 52 equal-size bags of grass seed. How many kilograms of grass seed are in each bag?



Working with a partner, use any division method you are comfortable with. We will solve this problem using the **AREA MODEL** and **vertical form**. (Tip: a place value chart would not be efficient with 52 groups!)

	4		8 tenths
52	$\begin{array}{r} 249.6 \\ - 208.0 \\ \hline 41.6 \end{array}$		$\begin{array}{r} 416 \text{ tenths} \\ - 416 \text{ tenths} \\ \hline 0 \text{ tenths} \end{array}$

A blue arrow points from the 41.6 in the area model to the 416 tenths in the vertical form.

$$\begin{array}{r} 004.8 \\ 52 \overline{) 249.6} \\ \underline{- 208} \\ 416 \\ \underline{- 416} \\ 0 \end{array}$$

Before I show you, the solution using the area model and vertical form, I want you to share, compare, and connect your methods.

ESTIMATE

$$249.6 \div 52$$

$$250 \div 50$$

$$25 \div 5 \approx 5 \text{ kg}$$

4.8 kg

LEARN (30-min)

Equal Groups Word Problem

LEARN book page 207.

3. Tara pours 40.25 cups of juice equally into 23 glasses. How much juice is in each glass?



Working with a partner, use the AREA MODEL or vertical form to find the quotient. (Tip: a place value chart would not be efficient with 23 groups!)

ESTIMATE

$$40.25 \div 23$$

$$40 \div 20$$

$$4 \div 2 \approx 2 \text{ cups}$$

1.75 cups

1	7 tenths	5 hundredths
$\begin{array}{r} 40.25 \\ - 23.00 \\ \hline 17.25 \end{array}$	$\begin{array}{r} 172 \text{ tenths } 5 \text{ hundredths} \\ - 161 \text{ tenths} \\ \hline 11 \text{ tenths } 5 \text{ hundredths} \end{array}$	$\begin{array}{r} 115 \text{ hundredths} \\ - 115 \text{ hundredths} \\ \hline 0 \text{ hundredths} \end{array}$

$$\begin{array}{r} 23 \overline{) 40.25} \\ \underline{- 23} \\ 172 \\ \underline{- 161} \\ 115 \\ \underline{- 115} \\ 0 \end{array}$$

LEARN (30-min)

Problem Set

LEARN book page 209.

Complete the area model and vertical form. Then complete the equation.

1. $793.6 \div 31 = \underline{25.6}$

	2 tens	<u>5</u> ones	<u>6</u> tenths
31	62 tens	155 ones	<u>186</u> tenths

				0.6		
				5.0		
			2	0.	0	
3	1)	7	9	3.	6
	-		6	2	0.	0
			1	7	3.	6
	-		1	5	5.0	
				1	8.6	
	-			1	8.6	
						0

LEARN (30-min)

Problem Set

LEARN book page 209.

2. $7.82 \div 23 = \underline{\hspace{2cm}}$

	3 tenths	<u>4</u> hundredths
23	69 tenths	<u>92</u> hundredths

		0.	0	4
		0.	3	0
2	3) 7. 8 2		
	-	6.	9	0
		0.	9	2
	-	0.	9	2
				0

LAND (10-min)

Exit Ticket



Name

Date



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Divide. Show your work.

$$20.88 \div 18 = \underline{\hspace{2cm}}$$

Exit Ticket – PAGE 213

Small Group Time:

Problem Set Pages 210 – 212

Homework:

Page 139 APPLY BOOK