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## **Module 4 - Lesson 17:**

Multiply decimal numbers to hundredths by two-digit whole numbers by using different methods.

**CCSS Standard – 5.NBT.B.7**

**FLUENCY** (10-min)

**Choral Response: Divide Whole Numbers by Unit Fractions**

What is the quotient? Raise your hand when you know.

$$2 \div \frac{1}{2} = \underline{\hspace{2cm}}$$

$$3 \div \frac{1}{2} = \underline{\hspace{2cm}}$$

$$2 \div \frac{1}{3} = \underline{\hspace{2cm}}$$

$$2 \div \frac{1}{4} = \underline{\hspace{2cm}}$$

$$3 \div \frac{1}{3} = \underline{\hspace{2cm}}$$

$$3 \div \frac{1}{4} = \underline{\hspace{2cm}}$$

$$4 \div \frac{1}{5} = \underline{\hspace{2cm}}$$

$$6 \div \frac{1}{6} = \underline{\hspace{2cm}}$$

**FLUENCY** (10-min)

**Choral Response: Multiply Fractions**

What is the quotient? Raise your hand when you know.

$$\frac{1}{2} \times \frac{1}{5} = \underline{\hspace{2cm}}$$

$$\frac{1}{2} \times \frac{3}{5} = \underline{\hspace{2cm}}$$

$$\frac{1}{5} \times \frac{1}{5} = \underline{\hspace{2cm}}$$

$$\frac{2}{5} \times \frac{4}{5} = \underline{\hspace{2cm}}$$

$$\frac{3}{6} \times \frac{2}{3} = \underline{\hspace{2cm}}$$

$$\frac{3}{6} \times \frac{6}{3} = \underline{\hspace{2cm}}$$

$$\frac{4}{5} \times \frac{5}{8} = \underline{\hspace{2cm}}$$

$$\frac{9}{5} \times \frac{7}{8} = \underline{\hspace{2cm}}$$

**FLUENCY** (10-min)

Whiteboard Exchange: Add or Subtract Decimal Numbers

Write and complete the equation. Show your method.

$0.7 + 0.6 = \underline{\hspace{2cm}}$

$$\begin{array}{r} + 0.7 \\ + 0.6 \\ \hline 1.3 \end{array}$$

$3.2 + 0.94 = \underline{\hspace{2cm}}$

$$\begin{array}{r} + 3.2 \\ + 0.94 \\ \hline 4.14 \end{array}$$

$1.4 - 0.8 = \underline{\hspace{2cm}}$

$$\begin{array}{r} - 1.4 \\ - 0.8 \\ \hline 0.6 \end{array}$$

**FLUENCY** (10-min)

Whiteboard Exchange: Add or Subtract Decimal Numbers

Write and complete the equation. Show your method.

$0.2 - 0.07 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 1 \\ 0.20 \\ - 0.07 \\ \hline 0.13 \end{array}$$

**LAUNCH** (5-min)

**Interpret a piece of art and how it relates to mathematics.**

This collage is called **The Dove**.

The artist who created it is named Romare Bearden.

Bearden created the collage by cutting up photographs, newspapers, magazines, and colored paper and gluing them to cardboard.

When artists like Bearden make a collage, they can be flexible in how they choose pieces to use and how to put them together to create the artwork. Bearden grew up in New York City during the Harlem Renaissance when jazz music was very popular, and he liked jazz music. In jazz music, the musician can choose which notes and rhythms to use and how to put them together.



**THINK-PAIR-SHARE:** about how a collage artist or a jazz musician making choices is similar to the choices you have to make doing mathematics. How do you select a method to add, subtract, multiply, or divide numbers?

**Today, we will reason about and use two strategies to multiply decimal numbers by two-digit whole numbers.**

**LEARN** (35-min)**Analyze and Use the Break Apart and Distribute Strategy to Multiply**

LEARN book page 157.

Take one minute of silent think time to describe the strategy that Lisa and Scott used to find the product.

Lisa's Way	Scott's Way
$2.5 \times 18 = \underline{45}$	$2.5 \times 18 = \underline{45}$
$2.5 \times 18 = (2 + 0.5) \times 18$	$2.5 \times 18 = 2.5 \times (10 + 8)$
$= (2 \times 18) + (0.5 \times 18)$	$= (2.5 \times 10) + (2.5 \times 8)$
$= 36 + 9$	$= 25 + 20$
$= 45$	$= 45$

Both Lisa and Scott used a break apart and distribute strategy to change the numbers so that the numbers are simpler to work with.

**YOUR TASK:** First estimate the product for problem #2:  $24 \times 1.5$ .

Next, use either Lisa's or Scott's way to break apart and distribute to solve the problem.

**LEARN** (35-min)

Analyze and Use the **Break Apart and Distribute Strategy** to Multiply

LEARN book page 157.

2. Use Lisa's way or Scott's way to find  $24 \times 1.5$ .

$$24 \times 1.5$$

**Estimate first!** 1.5 is about 2 so,  $24 \times 2 = 48$ . This is a reasonable answer before we multiply. We know that since we rounded up, that the actual product will be less than 48.

Lisa's Way

$$\begin{aligned} 24 \times 1.5 &= 24 (1 + 0.5) \\ &= (24 \times 1) + (24 \times 0.5) \\ &= 24 + 12 \\ &= \mathbf{36} \end{aligned}$$

Scott's Way

$$\begin{aligned} 24 \times 1.5 &= (20 + 4) \times 1.5 \\ &= (20 \times 1.5) + (4 \times 1.5) \\ &= 30 + 6 \\ &= \mathbf{36} \end{aligned}$$

**LEARN** (35-min)**Analyze and Use the Compensation Strategy to Multiply**

LEARN book page 158.

Take one minute of silent think time to describe the strategy that Tyler and Jada used to find the product.

Tyler's Way	Jada's Way
$2.5 \times 18 = \underline{45}$	$2.5 \times 18 = \underline{45}$
$2.5 \times 18 = (3 \times 18) - (0.5 \times 18)$	$\begin{array}{r} 2.5 \\ \times 18 \\ \hline \end{array} \xrightarrow{\times 10} \begin{array}{r} 25 \\ \times 18 \\ \hline \end{array}$
$= 54 - 9$	$\begin{array}{r} 25 \\ \times 18 \\ \hline 200 \\ + 250 \\ \hline 450 \end{array}$
$= 45$	$450 \div 10 = 45$

Both Tyler and Jada used a compensation strategy to change the numbers so that the numbers are simpler to work with. With a compensation strategy, we change one of the original factors before multiplying, and then we make a corresponding change after multiplying the new factors to compensate for the change we made.

**YOUR TASK:** First estimate the product for problem #3:  $2.5 \times 18$ .

Next, use either Tyler's or Jada's way to break apart and distribute to solve the problem.

**LEARN** (35-min)

LEARN book, page 160.

## Vertical Form

$$\begin{array}{r} 3.6 \\ \times 35 \\ \hline 180 \\ + 1080 \\ \hline 126.0 \end{array}$$

$3.6 \times 10 \rightarrow 36$  tenths

Tenths  $\div 10$

Choose a Method to Multiply

## ESTIMATE

3.6 rounds to 4.

$$4 \times 35 = 140.$$

We rounded up so our actual product will be less than 140.

$$3.6 \times 35$$

## Break Apart & Distribute

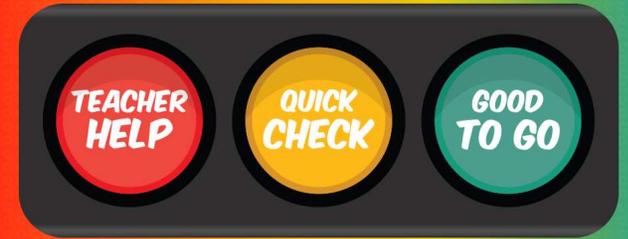
$$\begin{aligned} 3.6 \times 35 &= (3 + 0.6) \times 35 \\ &= (3 \times 35) + (0.6 \times 35) \\ &= 105 + 21 \\ &= 126 \end{aligned}$$

## Compensation Strategy

$$\begin{aligned} 35 \times 3.6 &= (35 \times 4) - (35 \times 0.4) \\ &= 140 - 14 \\ &= 126 \end{aligned}$$

**LAND** (10-min)

## Exit Ticket



**17**

\_\_\_\_\_ Name \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

Consider the expression.

$$72 \times 3.7$$

a. Estimate the product.

$$72 \times 3.7 \approx \underline{\hspace{2cm}}$$

b. Find the product. Show your work.

$$72 \times 3.7 = \underline{\hspace{2cm}}$$

Exit Ticket – PAGE 163

**Small Group Time:**

Problem Set Pages 159 -160

**Homework:**

Page 107 APPLY BOOK