

## Unit 3 Lesson 17: Calculating Products of Decimals

### 1 Number Talk: Twenty Times a Number (Warm up)

#### Student Task Statement

Evaluate mentally.

$$20 \cdot 5$$

$$20 \cdot (0.8)$$

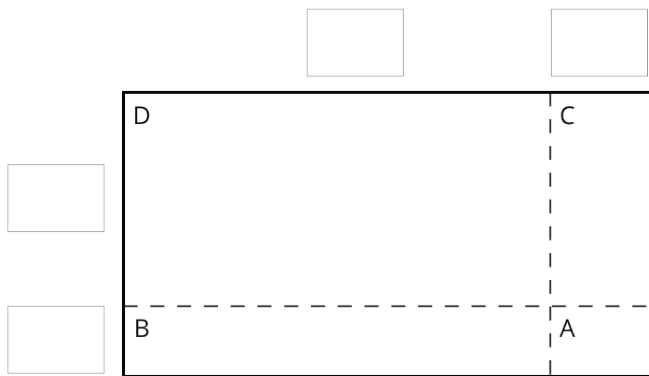
$$20 \cdot (0.04)$$

$$20 \cdot (5.84)$$

## 2 Using the Partial Products Method (Optional)

### Student Task Statement

1. Label the area diagram to represent  $(2.5) \cdot (1.2)$  and to find that product.



a. Decompose each number into its base-ten units (ones, tenths, etc.) and write them in the boxes on each side of the rectangle.

b. Label Regions A, B, C, and D with their areas. Show your reasoning.

c. Find the product that the area diagram represents. Show your reasoning.

2. Here are two ways to calculate  $(2.5) \cdot (1.2)$ . Each number with a box gives the area of one or more regions in the area diagram.

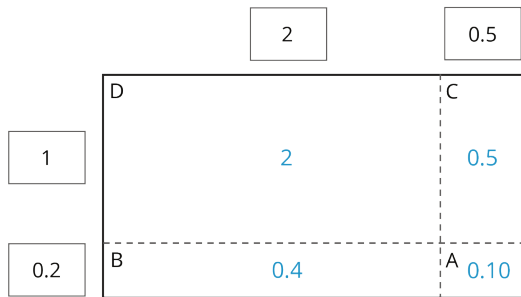
$  \begin{array}{r}  \phantom{\times} \phantom{2.5} \\  \times \phantom{2.5} 1.2 \\  \hline  \phantom{\times} 0.1 \\  \phantom{\times} 0.4 \\  \phantom{\times} 0.5 \\  + \phantom{\times} 2.0 \\  \hline  \phantom{\times} 3.0 \phantom{0}  \end{array}  $ <div style="display: flex; align-items: center; margin-left: 100px;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-right: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-right: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>	$  \begin{array}{r}  \phantom{\times} \phantom{2.5} \\  \times \phantom{2.5} 1.2 \\  \hline  \phantom{\times} 0.5 \\  + \phantom{\times} 2.5 \\  \hline  \phantom{\times} 3.0 \phantom{0}  \end{array}  $ <div style="display: flex; align-items: center; margin-left: 100px;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-right: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>
---	---

Calculation A

Calculation B

- a. In the boxes next to each number, write the letter(s) of the corresponding region(s).
- b. In Calculation B, which two numbers are being multiplied to obtain 0.5?  
Which numbers are being multiplied to obtain 2.5?

# Activity Synthesis



$  \begin{array}{r}  2.5 \\  \times 1.2 \\  \hline  0.10 \\  0.4 \\  0.5 \\  + 2.0 \\  \hline  3.00  \end{array}  $	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">A</td> </tr> <tr> <td style="padding: 2px 5px;">B</td> </tr> <tr> <td style="padding: 2px 5px;">C</td> </tr> <tr> <td style="padding: 2px 5px;">D</td> </tr> </table>	A	B	C	D
A					
B					
C					
D					
$  \begin{array}{r}  2.5 \\  \times 1.2 \\  \hline  0.5 \\  + 2.5 \\  \hline  3.00  \end{array}  $	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">A + B</td> </tr> <tr> <td style="padding: 2px 5px;">C + D</td> </tr> </table>	A + B	C + D		
A + B					
C + D					

Calculation A

Calculation B

### 3 Calculating Products of Decimals

#### Student Task Statement

1. A common way to find a product of decimals is to calculate a product of whole numbers, then place the decimal point in the product.

$$\begin{array}{r} \phantom{\times} 25 \\ \times \phantom{0} 12 \\ \hline \phantom{+} 50 \\ + 250 \\ \hline 300 \end{array}$$

Here is an example for  $(2.5) \cdot (1.2)$ .

Use what you know about decimals and place value to explain why the decimal point of the product is placed where it is.

$$25 \cdot 12 = 300$$

$$(2.5) \cdot (1.2) = 3.00$$

2. Use the method shown in the first question to calculate each product.

a.  $(4.6) \cdot (0.9)$

b.  $(16.5) \cdot (0.7)$

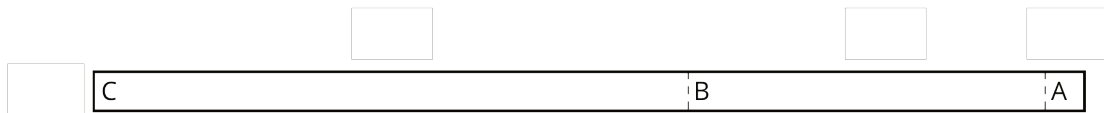
3. Use area diagrams to check your earlier calculations. For each problem:

- Decompose each number into its base-ten units and write them in the boxes on each side of the rectangle.
- Write the area of each lettered region in the diagram. Then find the area of the entire rectangle. Show your reasoning.

a.  $(4.6) \cdot (0.9)$



b.  $(16.5) \cdot (0.7)$



4. About how many centimeters are in 6.25 inches if 1 inch is about 2.5 centimeters? Show your reasoning.

## 4 Practicing Multiplication of Decimals (Optional)

### Student Task Statement

1. Calculate each product. Show your reasoning. If you get stuck, consider drawing an area diagram to help.

a.  $(5.6) \cdot (1.8)$

b.  $(0.008) \cdot (7.2)$

2. A rectangular playground is 18.2 meters by 12.75 meters.

a. Find its area in square meters. Show your reasoning.

b. If 1 meter is approximately 3.28 feet, what are the approximate side lengths of the playground in feet? Show your reasoning.