## Unit 3 Lesson 16: Methods for Multiplying Decimals

### 1 Multiplying by 10 (Warm up)

#### Student Task Statement

1. In which equation is the value of $x$ the largest?
* $x⋅10=810$
* $x⋅10=81$
* $x⋅10=8.1$
* $x⋅10=0.81$
1. How many times the size of 0.81 is 810?

### 2 Fractionally Speaking: Multiples of Powers of Ten

#### Student Task Statement

1. Select **all** expressions that are equivalent to $(0.6)⋅(0.5)$. Be prepared to explain your reasoning.
	1. $6⋅(0.1)⋅5⋅(0.1)$
	2. $6⋅(0.01)⋅5⋅(0.1)$
	3. $6⋅\frac{1}{10}⋅5⋅\frac{1}{10}$
	4. $6⋅\frac{1}{1,000}⋅5⋅\frac{1}{100}$
	5. $6⋅(0.001)⋅5⋅(0.01)$
	6. $6⋅5⋅\frac{1}{10}⋅\frac{1}{10}$
	7. $\frac{6}{10}⋅\frac{5}{10}$
2. Find the value of $(0.6)⋅(0.5)$. Show your reasoning.
3. Find the value of each product by writing and reasoning with an equivalent expression with fractions.
	1. $(0.3)⋅(0.02)$
	2. $(0.7)⋅(0.05)$

### 3 Using Properties to Reason about Multiplication

#### Student Task Statement

Elena and Noah used different methods to compute $(2.4)⋅(1.3)$. Both calcuations were correct.



1. Analyze the two methods, then discuss these questions with your partner.
	* Which method makes more sense to you? Why?
	* What might Elena do to compute $(0.16)⋅(0.03)$? What might Noah do to compute $(0.16)⋅(0.03)$? Will the two methods result in the same value?
2. Compute each product using the equation $21⋅47=987$ and what you know about fractions, decimals, and place value. Explain or show your reasoning.
	1. $(2.1)⋅(4.7)$
	2. $21⋅(0.047)$
	3. $(0.021)⋅(4.7)$

### 4 Connecting Area Diagrams to Calculations with Decimals

#### Student Task Statement

1. You can use area diagrams to represent products of decimals. Here is an area diagram that represents $(2.4)⋅(1.3)$.
* 
	1. Find the region that represents $(0.4)⋅(0.3)$. Label it with its area of 0.12.
	2. Label the other regions with their areas.
	3. Find the value of $(2.4)⋅(1.3)$. Show your reasoning.
1. Here are two ways of calculating $(2.4)⋅(1.3)$.
* 
* Analyze the calculations and discuss these questions with a partner:
	+ In Calculation A, where does the 0.12 and other partial products come from?
	+ In Calculation B, where do the 0.72 and 2.4 come from?
	+ In each calculation, why are the numbers below the horizontal line aligned vertically the way they are?
1. Find the product of $(3.1)⋅(1.5)$ by drawing and labeling an area diagram. Show your reasoning.
2. Show how to calculate $(3.1)⋅(1.5)$ using numbers without a diagram. Be prepared to explain your reasoning. If you are stuck, use the examples in a previous question to help you.

#### Activity Synthesis





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