G5-M2-Lesson 1

1. Fill in the blanks using your knowledge of place value units and basic facts.

    a. 34×20

    Think: 34 ones $\times$ 2 tens = __68 *tens*__

    $34 \times 20 =$ __680__

    > 34 ones $\times$ 2 tens $= (34 \times 1) \times (2 \times 10)$.
    > First, I did the mental math: $34 \times 2 = 68$.
    > Then I thought about the units. *Ones times tens is tens.*
    > 68 tens is the same as 680 ones or 680.

    b. 420×20

    Think: 42 tens $\times$ 2 tens = __84 *hundreds*__

    $420 \times 20 =$ __8,400__

    > First, I'll multiply 42 times 2 in my head because that's a basic fact: 84.
    > Next, I have to think about the units. *Tens times tens is hundreds.*
    > Therefore, my answer is 84 hundreds or 8,400.

    > Another way to think about this is $42 \times 10 \times 2 \times 10$.
    > I can use the associative property to switch the order of the factors: $42 \times 2 \times 10 \times 10$.

    c. 400×500

    4 hundreds $\times$ 5 hundreds = __20 *ten thousands*__

    $400 \times 500 =$ __200,000__

    > I have to be careful because the basic fact, $4 \times 5 = 20$, ends in a zero.

    > Another way to think about this is $4 \times 100 \times 5 \times 100$
    > $$= 4 \times 5 \times 100 \times 100$$
    > $$= 20 \times 100 \times 100$$
    > $$= 20 \times 10,000$$
    > $$= 200,000$$

2. Determine if these equations are true or false. Defend your answer using knowledge of place value and the commutative, associate, and/or distributive properties.

   a. 9 tens = 3 tens × 3 tens

   False. The basic fact is correct: $3 \times 3 = 9$.

   However, the units are not correct: 10×10 is 100.

   > Correct answers could be 9 tens = 3 tens × 3 ones, or 9 hundreds = 3 tens × 3 tens.

   b. $93 \times 7 \times 100 = 930 \times 7 \times 10$

   True. I can rewrite the problem. $93 \times 7 \times (10 \times 10) = (93 \times 10) \times 7 \times 10$

   > The associative property tells me that I can group the factors in any order without changing the product.

3. Find the products. Show your thinking.

60×5	60×50	$6,000 \times 5,000$
$= (6 \times 10) \times 5$	$= (6 \times 10) \times (5 \times 10)$	$= (6 \times 1,000) \times (5 \times 1,000)$
$= (6 \times 5) \times 10$	$= (6 \times 5) \times (10 \times 10)$	$= (6 \times 5) \times (1,000 \times 1,000)$
$= 30 \times 10$	$= 30 \times 100$	$= 30 \times 1,000,000$
$= 300$	$= 3,000$	$= 30,000,000$

   > I use the distributive property to decompose the factors.

   > Then, I use the associative property to regroup the factors.

   > I multiply the basic fact first. Then I think about the units.

   > I have to be careful because the basic fact, 6 × 5, has a zero in the product. I multiply the basic fact and then think about the units.
   >
   > 6 tens times 5 is 30 tens. 30 tens is the same as 300. I could get the wrong answer if I just counted zeros.

   > I can think of this in unit form: 6 thousands times 5 thousands. 6 × 5 = 30. The units are thousands times thousands. I can picture a place value chart in my head to solve a thousand times a thousand. A thousand times a thousand is a million. The answer is 30 million, or 30,000,000.