Lesson 1.6 – Multiplying a Single Digit by a Power of 10 (+ Exponents)

Recall that every digit in a number is associated with a place value. Let's review the place values of the following number. Fill in the boxes below using the appropriate terms from the word bank.

7   2   ,   4   8   5   .   3   9   1   6

WORD BANK

tenths	ten-thousands	hundredths	tens	ten-thousandths
hundreds	thousandths	ones	thousands	

_____

$$7 \times 10^5$$

Multiplying a Single Digit by a Power of 10 (positive exponents)

A single digit being multiplied by a power of 10 containing a positive exponent.

When dealing with large numbers it can be helpful to express them using a power of ten. To begin, we will focus on powers of ten that contain a positive exponent. Place values that are associated with these powers of ten are found on the left side of the decimal. We will complete an activity that just focuses on these digits. We will take a closer look at the digits on the right side of the decimal in our next lesson.

Complete the activity on the next page.

Activity 1 - Express each number on the left as a power of ten. You may use the "Power of Ten Bank" for help.

1 =	**Power of Ten Bank**
1,000,000 =	10^3 10^9
100 =	10^4
	10^7
	10^8 10^1
1,000,000,000 =	
	10^6 10^5
100,000,000 =	10^0
	10^2
10,000 =	
10 =	
10,000,000 =	
100,000 =	
1,000 =	

Explain the pattern that you see above.

Activity 2 – Fill in the chart below. Use the example as a guide.

7   2   ,   4   8   5   .   3   9   1   6
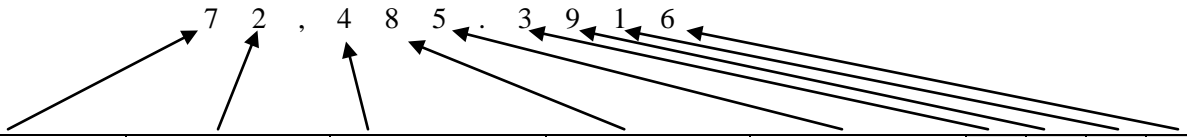
Numerical Description for place value		1,000							
Description in the base of 10		10^3							
Representing the digit using the base of 10		2×10^3							

Activity 3 – Determine the value for the "*x*" that would make the statement true.

$5 \times 10^x = 5{,}000$	$6 \times 10^x = 600{,}000$	$9 \times 10^x = 90{,}000$	$3 \times 10^x = 300$	$2 \times 10^x = 2{,}000{,}000$

Explain how you determined each "*x*" in Activity 3.

Class Notes – Simplify each of the following.

LP#1 $7 \times 10^4 =$	$5 \times 10^6 =$	$8 \times 10^2 =$
LP#2 $3 \times 10^{10} =$	$6 \times 10^1 =$	$2 \times 10^8 =$
LP#3 $4 \times 10^0 =$	$9 \times 10^3 =$	$1 \times 10^5 =$

Lesson 1.6

Class Notes – Write each number as a product of a whole number and a power of 10.

LP#4 2,000,000	6,000	90
LP#5 70,000	500,000	30,000,000
LP#6 400	8,000,000	2,000

More Practice.

1) What power of 10 is found in between 2,321 and 456?

2) What power of 10 is found in between 879,432 and 2,045,565?

3) What power of 10 is equivalent to 1,000,000,000?

4) Rewrite $(5 \times 10^4) + (9 \times 10^2) + (7 \times 10^1) \times (3 \times 10^0)$ in standard form.

Review – In the **left column** simplify each expression. In the **right column** write each number as a product of a whole number and a power of 10.

R#1	200
$7 \times 10^9 =$	
	5,000,000
$4 \times 10^0 =$	
R#2	9
$9 \times 10^{11} =$	
	7,000,000,000
$2 \times 10^4 =$	
R#3	3,000
$6 \times 10^7 =$	
	80,000
$3 \times 10^0 =$	