Lesson Title 5.5 Scientific Notation DAY TWO NOTES **B2A2** **Date** _____

OBJECTIVE 1: Scientific Notation

We use this when we need to write really large or extremely small number using a standard decimal notation.

x 10^{exponent} calculator: #E# before the E is decimal 0 – 9 and after is the exponent)

STEPS:

1) Move the decimal point to the left or to the right so that the value is between 0 & 9

2) Count the number of decimal places the decimal moved and that is the exponent. If the original number was larger than 10 the exponent is positive and if the original number was less than 1 then the exponent is negative.

TASK 1: Write each number in scientific notation. Show your work.

a) 367,000,000 ← 8 → $3.67 \cdot 10^{8}$

b) 0.000003 → 6 → 3×10^{-6}

c) 20,520,000,000 ← 10 → $2.052 \cdot 10^{10}$

d) 0.00085 → 4 → $8.5 \cdot 10^{-4}$

OBJECTIVE 2: Converting Numbers to Standard Form

Working backwards from have a number in scientific notation.

STEPS:

1) If the exponent is positive then move the decimal to the right that many times
   - Your final number will be larger than 10
2) If the exponent is negative then move the decimal to the left that many times
   - Your final number will be smaller than 1

TASK 2: Simplify each expression. Write results using positive exponents only.

a) 1.02×10^{5} → 1,02000. → 102,000

b) 7.358×10^{-3} → .007358 → 0.007358

c) 8.4×10^{7} → 84,000,000. → 84,000,000

d) 3.007×10^{-5} → .00003007 → 0.0000300 7

OBJECTIVE 3: Performing Operations with Scientific Notation

Remember these are still exponents, so the Laws of Exponents still apply.

- *Multiplying like bases, add the exponents*
- *Dividing like bases, subtract the exponents*
- *Use your calculator to check your work*

TASK 3: Perform each indicated operation. Write each result in standard decimal notation and scientific notation.

a) $(8 \times 10^{-6})(7 \times 10^{3})$

$(8 \cdot 7)(10^{-6+3})$

56×10^{-3}

0.056

5.6×10^{-2}

b) $\frac{(12 \times 10^{2})}{6 \times 10^{-3}}$

$\left(\frac{12}{6}\right)\left(10^{2--3}\right)$

2×10^{5}

$200{,}000$

c) $(5 \times 10^{-4})(8 \times 10^{6})$

$(5 \cdot 8)(10^{-4+6})$

$40 \cdot 10^{2}$

$4 \cdot 10^{3}$

$4{,}000$

d) $\frac{(64 \times 10^{3})}{32 \times 10^{-7}}$

$\left(\frac{64}{32}\right)\left(10^{3-(-7)}\right)$

$2 \cdot 10^{10}$

$20{,}000{,}000{,}000$

Still need help with: