Name _____ Date ANSWER KEY Page 1

SCIENTIFIC NOTATION

You can use **scientific notation** to write very large or very small numbers. Here is an example:

Standard Form		**Scientific Notation**
32,000,000	=	3.2×10^7

In scientific notation, the first factor must be ≥ 1 and < 10. The second factor must be a power of 10.

To convert a number from scientific notation to standard form, look at the power of 10 to see how many places to move the decimal point. Positive exponents move the decimal point to the right, and negative exponents move the decimal point to the left.

Here are some examples:

6.59×10^8 *Move the decimal point 8 places to the right, adding zeros as needed.*

6.59000000

$6.59 \times 10^8 = 659{,}000{,}000$

3×10^{-4} *Move the decimal point 4 places to the left, adding zeros as needed.*

0003.

$3 \times 10^{-4} = 0.0003$

Write each number in standard form.

4.7×10^3 = 4,700

6×10^{-2} = 0.06

5×10^4 = 50,000

1.2×10^{-4} = 0.00012

3.6×10^5 = 360,000

6.1×10^{-6} = 0.0000061

8.06×10^7 = 80,600,000

7.92×10^{-3} = 0.00792

7.127×10^6 = 7,127,000

4×10^{-5} = 0.00004

3.014×10^8 = 301,400,000

4.23×10^{-7} = 0.000000423

SCIENTIFIC NOTATION

You can also convert numbers from standard form to scientific notation. Follow these steps:

1. Find the first factor. Move the decimal point until you get a number that is ≥ 1 and < 10.
2. Find the exponent in the power of 10. Count the number of places you moved the decimal point, noticing the direction you moved.
   - If you moved the decimal point to the left, the exponent will be positive.
   - If you moved the decimal point to the right, the exponent will be negative.

Here are some examples:

5,300,000 *Move the decimal point between 5 and 3. The first factor will be 5.3.*

5,300,000. *You moved the decimal point 6 places to the left. The exponent in the power of 10 will be 6.*

$5{,}300{,}000 = 5.3 \times 10^{6}$

0.00002 *Move the decimal point behind the 2. The first factor will be 2.*

0.00002 *You moved the decimal point 5 places to the right. The exponent in the power of 10 will be -5.*

$0.00002 = 2 \times 10^{-5}$

Write each number in scientific notation.

0.007 = 7×10^{-3}

90,000 = 9×10^{4}

0.032 = 3.2×10^{-2}

473,000 = 4.73×10^{5}

0.00099 = 9.9×10^{-4}

3,600,000 = 3.6×10^{6}

1,072,000 = 1.072×10^{6}

0.00194 = 1.94×10^{-3}

468,000,000 = 4.68×10^{8}

0.000072 = 7.2×10^{-5}

3,240,000,000 = 3.24×10^{9}

0.00000309 = 3.09×10^{-6}