Name: _____ SN-1

Introduction to Scientific Notation- Large Numbers

Scientific notation: a shorthand method to express very large or very small numbers.
Ex: $3{,}400{,}000{,}000 = 3.4 \times 10^9$

General Structure:

$$C \times 10^n$$

C: Number between 1 and 9.9999

n: Number of times you moved the decimal

To convert a number from **standard form** to **scientific notation**:

1. Move the _____ as much as needed to obtain a decimal number between 1 and 10.
   Ex. $3{,}562 = 3562.0 \rightarrow 3.562$
2. The amount of places the decimal was moved becomes the _____ on the 10.
   Ex. Moved the decimal 3 places $\rightarrow 10^3$
3. $3{,}562 = 3.562 \times 10^3$ in scientific notation.

NOTE*: If the decimal point moves _____, the exponent on the 10 is **positive

Practice: Write the following numbers in scientific notation.

1. 8,546 = ___._____ × 10
2. 23,000 = ___._____ × 10
3. 572.9 = ___._____ × 10
4. 2,990,000 = ___._____ × 10
5. 3418.06 = ___._____ × 10
6. 645,000 = ___._____ × 10
7. 98.3 = ___._____ × 10
8. 469,000,000= ___._____ × 10
9. 3,964 = ___._____ × 10
10. 13.98 = ___._____ × 10

CONVERSELY:

To convert a number from **scientific notation** to **standard form**

1) **Positive** exponent → move the decimal point to the _____,
2) Move the decimal from its current place, the *amount* and *direction* specified by the exponent on the 10.
   Eg. $2.31 \times 10^3 \rightarrow 2310$

Practice: Convert these numbers to standard form.

1) $2 \times 10^3 =$ _____
2) $2.331 \times 10^5 =$ _____
3) $5 \times 10^6 =$ _____
4) $7.627 \times 10^5 =$ _____
5) $3.004 \times 10^9 =$ _____
6) $5.23 \times 10^4 =$ _____
7) $5.062 \times 10^2 =$ _____
8) $9.876 \times 10^7 =$ _____
9) $2.1 \times 10^{11} =$ _____
10) $1.034 \times 10^4 =$ _____

Problem Set:

Express the following in Scientific Notation:

1) 61,500 = ___.____ × 10
2) 783,000 = ___.____ × 10
3) 321.1 = ___.____ × 10
4) 9,770,000 = ___.____ × 10
5) 52.786 = ___.____ × 10
6) 10,632,000 = ___.____ × 10

Express the following in Standard Notation:

7) $2.46 \times 10^8 =$ _____
8) $4.33 \times 10^5 =$ _____
9) $5.8 \times 10^3 =$ _____
10) $3.045 \times 10^6 =$ _____
11) $9.413 \times 10^{10} =$ _____
12) $7.62 \times 10^2 =$ _____