Scientific Notation

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Scientific Notation

In science, we deal with some very LARGE numbers:

1 mole = 602000000000000000000000
Mass of Earth 597219000000000000000000

In science, we deal with some very SMALL numbers:

Mass of an electron = 0.00000000000000000000000000000091 kg
Charge of an electron = 0.00000000000000001602 coulombs

Imagine the difficulty of calculating the mass of 1 mole of electrons!

0.00000000000000000000000000000091 kg
x 602000000000000000000000

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Scientific Notation:

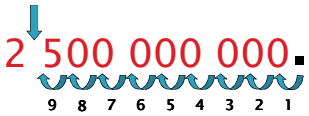
A method of representing very large or very small numbers in the form:

$M \times 10^n$

- M (coefficient) is a number between 1 and 10
- n (exponent) is an + or – whole number (integer)

Scientific Notation

- A method of representing very large or very small numbers in the form: $M \times 10^n$
- M is the coefficient and can be + or – and must be between 1.0 and 9.9
- n is the exponent and can be + or – and it tells the direction the decimal moves. (Must be a whole #)



Step #1: Insert an understood decimal point

Step #2: Decide where the decimal must end up so that one number is to its left

Step #3: Count how many places you bounce the decimal point

Step #4: Re-write in the form $M \times 10^n$

2.5×10^{9}

The exponent is the number of places we moved the decimal.

0.0000579

1 2 3 4 5

Step #1: Decide where the decimal must end up so that one number is to its left

Step #2: Count how many places you bounce the decimal point

Step #3: Re-write in the form M x 10^{n}

5.79×10^{-5}

The exponent is negative because the number we started with was less than 1.

Sci Not Practice

Expand these numbers:

- 5.6×10^{4}
- 3.5×10^{7}
- 1.3×10^{-3}
- -4.145×10^{2}
- 2.83×10^{-4}

Sci Not Practice

Write these numbers in Scientific Notation.

- 4,560,000
- -5,478
- -0.0034
- 7,834
- 0.0041
- 0.00000000781

Scientific Notation Review

- A method of representing very large or very small numbers in the form: M x 10^{n}
- M is the coefficient and can be + or – and must be between 1.0 and 10
- n is the exponent and can be + or – and it tells the direction the decimal moves. (Must be a whole #)