

# Warm-up!!

Which is equivalent to the expression shown below for all values of  $a$  and  $b$  for which the expression is defined?

$$\frac{(a^2b^3)(3ab^2)}{12a^4b}$$

A  $\frac{b^6}{4a^2}$

~~B  $4ab^4$~~

~~C  $\frac{b^5}{8a}$~~

**D  $\frac{b^4}{4a}$**

$$\frac{3a^3b^5}{12a^4b}$$

$$\frac{1b^4}{4a}$$

$$4a$$

The table shows the total amount of snow during a winter storm. Which formula shows the number of inches of snow,  $n$ , after a given hour,  $h$ ?

Hours	1	2	3	4
Inches	0.62	1.24	1.86	2.48

~~E  $h = 0.62n$~~

**G  $n = 0.62h$**

H  $n = h + 0.62$

J  $h = n + 0.62$



# Scientific Notation

The Solar System

# State Standards:

CLE 3102.2.1 Understand computational results and operations involving real numbers in multiple representations.

CLE 3102.3.2 Understand and apply properties in order to perform operations with, evaluate, simplify, and factor expressions and polynomials.

CLE 3102.2.2 Understand properties of and relationships between subsets and elements of the real number system.

## In the real world??

\*to easily write really big numbers (space, money, ect) to writing really small numbers (bacteria, atoms, etc)

# What is Scientific Notation??

\*It is a way to write really big numbers and really small numbers easier.

\*You write these numbers with a base of ten

Rules!!  $1^{-9} \neq \times 10^?$

\*You can only have one number in front of the decimal

\*The number of spaces you move the decimal to the left will be your positive exponent. *big #*

\*The number of spaces you move the decimal to the right will be your negative exponent. *small #*

## Examples:

76,000,000,000

$$7.6 \times 10^{10}$$

\* 0.00000045

$$4.5 \times 10^{-7}$$

6,530,000,000,000,000

\* 894,000

$$8.94 \times 10^5$$

0.0053

$$5.3 \times 10^{-3}$$

0.000000000000009

# What is Standard Form?

- \*A number is written in standard form if it still has all of its zeros.
- \*The opposite of scientific notation.

## Rules!!

\*If the exponent is positive, move the decimal to the right.

\*If the exponent is negative, move the decimal to the left.

# Examples:

$$2.14 \times 10^{8.2} \quad 214,000,000$$

$$3.6 \times 10^7 \quad 36,000,000$$

$$5.8 \times 10^{-5} \quad .000058$$

$$2.9 \times 10^{-3} \quad .0029$$

$$1. \times 10^5 \quad 100,000$$

# Multiplication and Division

\*Remember to add your exponents when you multiply.

\*Remember to subtract your exponents when you divide.



Examples:

$$(3 \times 10^4)(5 \times 10^{-2})$$

$$15 \times 10^{2+1} \quad 1.5 \times 10^3$$

$$(1.2 \times 10^7)(3.1 \times 10^{-3})$$

$$3.72 \times 10^4$$

Examples:

$$\frac{8 \times 10^{11}}{4 \times 10^3}$$

$$2 \times 10^8$$

$$\frac{3.6 \times 10^{-8}}{1.2 \times 10^5}$$

$$3 \times 10^{-13}$$

During the year 2000, 1.65 billion credit cards were in use in the United States. During that same year, \$1.54 trillion was charged on these cards.

- a. Write each number in scientific notation.
  
  
  
  
  
  
  
  
  
  
- b. Find the average amount charged per credit card.