

Name _____

Date _____

Aim: How can we multiply and divide in scientific notation?

D O N O W :

1. Write each number in standard form.

a. 4.603×10^4

4.6030
 $\boxed{46030}$

b. 5.1×10^{-3}

$.0051$
 $\boxed{.0051}$

2. Write each number in scientific notation.

a. 1,308,000.

1.308×10^6

b. 0.00062

6.2×10^{-4}

3. Simplify each expression as a single power (hint: laws of exponents)

a. $10^2 \times 10^3$
 10^5

b. $10^{-4} \times 10^6$
 10^2

c. $10^6 \div 10^3$
 10^3

d. $10^2 \div 10^5$
 10^{-3}

Standard Form: $(210,000,000)(32,000)$
 2.1×10^8

Multiplying in Scientific Notation

Scientific Notation: $(2.1 \times 10^8)(3.2 \times 10^4)$

Step 1: Multiply coefficients together.

$$\begin{array}{r} 2.1 \\ \times 3.2 \\ \hline 42 \\ 630 \\ \hline 6.72 \end{array}$$

Step 2: Multiply powers of 10 (add exponents)
 10^{12}

Step 3: Write answer in sci. notation

$\boxed{6.72 \times 10^{12}}$

Practice

1. $(2.3 \times 10^4)(1.2 \times 10^6)$

$\boxed{2.76 \times 10^{10}}$

2. $(7.6 \times 10^3)(1.2 \times 10^{-4})$

$\boxed{9.12 \times 10^{-1}}$

3. $(3.4 \times 10^2)(2.3 \times 10^1)$

$\boxed{7.82 \times 10^3}$

Dividing in Scientific Notation

$$\frac{(4.0 \times 10^3)}{(2.0 \times 10^2)}$$

Step 1: Divide coefficients.

$$2 \overline{)4}$$

Step 2: Divide powers of 10 (subtract exponent) 10^1

Step 3: Write answer in scientific notation.

$$\boxed{2 \times 10^1}$$

4.) $\frac{(1.44 \times 10^2)}{(1.2 \times 10^5)}$ $\begin{matrix} 2-5 \\ 2+(-5) \\ -3 \end{matrix}$ 5.)

$$\boxed{1.2 \times 10^{-3}}$$

$\frac{(6.2 \times 10^6)}{(3.1 \times 10^2)}$ $6-2=4$ 6.)

$$\boxed{2 \times 10^4}$$

$\frac{(1.96 \times 10^6)}{(0.7 \times 10^{-3})}$ $\begin{matrix} 6-(-3) \\ 6+3 \\ 9 \end{matrix}$

$$\boxed{2.8 \times 10^9}$$

Multiplying/Dividing Practice

$$\frac{(9.2 \times 10^2)(5.4 \times 10^5)}{(2.0 \times 10^3)}$$

$$\frac{49.68 \times 10^7}{2 \times 10^3}$$

$$24.84 \times 10^4 \uparrow$$

$$\boxed{2.484 \times 10^5}$$

What if your answer is not in scientific notation?

Change the following numbers to scientific notation.

7.) $12.4 \times 10^3 \uparrow$

$$\boxed{1.24 \times 10^4}$$

8.) $0.0042 \times 10^3 \downarrow$

$$\boxed{4.2 \times 10^0}$$

9.) $563 \times 10^{-3} \uparrow$

$$\boxed{5.63 \times 10^{-1}}$$

10.) $0.024 \times 10^{-2} \downarrow$

$$\boxed{2.4 \times 10^{-4}}$$



When multiplying and dividing numbers in scientific notation, we first must multiply/divide the coefficients and then must use Laws of exponents for the powers.