

## 2-9 Scientific Notation

$$10^4 = 10 \cdot 10 \cdot 10 \cdot 10 = 10,000$$

$$10^3 = 10 \cdot 10 \cdot 10 = 1000$$

$$10^2 = 10 \cdot 10 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

$$10^{-1} = \frac{1}{10} = 0.1$$

$$10^{-2} = \frac{1}{100} = 0.01$$

$$10^{-3} = \frac{1}{1000} = 0.001$$

positive exponents

decimal to right.  $7 \times 10 = 7.0$

$$8 \times 10^2 = 8 \times 100 = 800$$

$$3 \times 10000 = 30000.$$

negative exponents

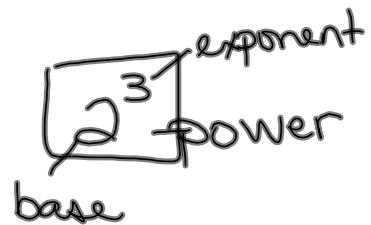
decimal to left  $2 \times 10^{-1} = 2 \times \frac{1}{10} = 0.2$

$$2^{64} = \underbrace{1.844674407}_{\text{factor}} \times 10^{19}$$

power of 10

1.8446744070000000000.

factor  
 x factor  
product



factor  $\geq 1$  but  $< 10$

$5.34 \times 10^4$  scientific notation

$\underline{5.3400} = 53,400$  standard form

$$7.42 \times 10^5$$

7.42000 = 742,000

$$\textcircled{0.061} \times 10^{-2}$$

$$\textcircled{3.714} \times 10^3$$
  
$$\underline{\textcircled{3.714}} = \underline{3.714}$$

place the decimal point after

first non-zero number

$$6.17 \times 10^2$$

$$\begin{array}{r} 3.725\,000 \\ \hline 3.725 \end{array} \times 10^6$$

Very large numbers  
positive exponent

$$\begin{array}{r} 0.000\,316 \\ \hline 3.16 \end{array} \times 10^{-4}$$

Very small numbers  
negative exponent

$$14,140,000 \quad 1.414 \times 10^7$$

$$0.00876$$
$$8.76 \times 10^{-3}$$

$$0.114$$
$$1.14 \times 10^{-1}$$