

# SCIENTIFIC NOTATION

A QUICK WAY TO WRITE

REALLY, REALLY **BIG**

OR

REALLY, REALLY SMALL **NUMBERS.**

# Mathematicians are Lazy!!!

They decided that by using powers of 10, they can create short versions of long numbers.

# Rules for Scientific Notation

To be in proper scientific notation the number must be written with

- \* a number between 1 and 10

- \* and multiplied by a power of ten

$23 \times 10^5$  is not in proper scientific notation. Why?

# Soooo

137,000,000 can be rewritten  
as

$$1.37 \times 10^8$$

# Now You Try

Using scientific notation,  
rewrite the following numbers.

347,000.

$3.47 \times 10^5$

902,000,000.

$9.02 \times 10^8$

61,400.

$6.14 \times 10^4$

**Convert these:**

$$1.23 \times 10^5$$

**123,000**

$$6.806 \times 10^6$$

**6,806,000**

# Try These

4,000

$4 \times 10^3$

$2.48 \times 10^3$

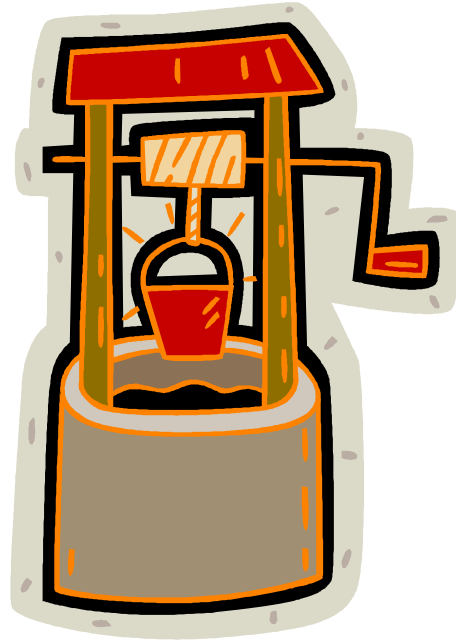
2,480

$6.123 \times 10^6$

6,123,000

306,000,000

$3.06 \times 10^8$



In the United States, 15,000,000 households use private wells for their water supply. Write this number in scientific notation.

$$1.5 \times 10^7$$



- The U.S. has a total of  $1.2916 \times 10^7$  acres of land reserved for state parks. Write this in standard form.



**12,916,000 acres**

Why does a Negative Exponent  
give us a small number?

$$10000 = 10 \times 10 \times 10 \times 10 = 10^4$$

$$1000 = 10 \times 10 \times 10 = 10^3$$

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

$$10 = 10^1$$

$$1 = 10^0$$

Do you see a pattern?

# Sooooo

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

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

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

$$\frac{1}{10000} = \frac{1}{10^4} = 10^{-4}$$

# Your Turn

Using Scientific Notation,  
rewrite the following numbers.

0.000882

$8.82 \times 10^{-4}$

0.00000059

$5.9 \times 10^{-7}$

0.00004

$4 \times 10^{-5}$

# More Examples

1) 0.0004

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

2)  $1.248 \times 10^{-6}$

$$.000001248$$

3)  $6.123 \times 10^{-5}$

$$.00006123$$

4) 0.00000306

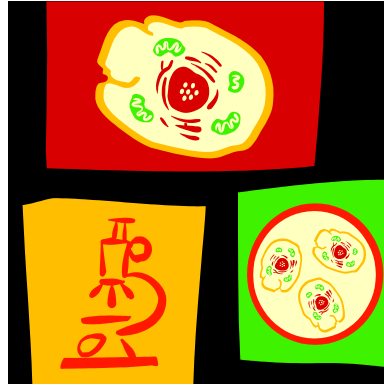
$$3.06 \times 10^{-6}$$

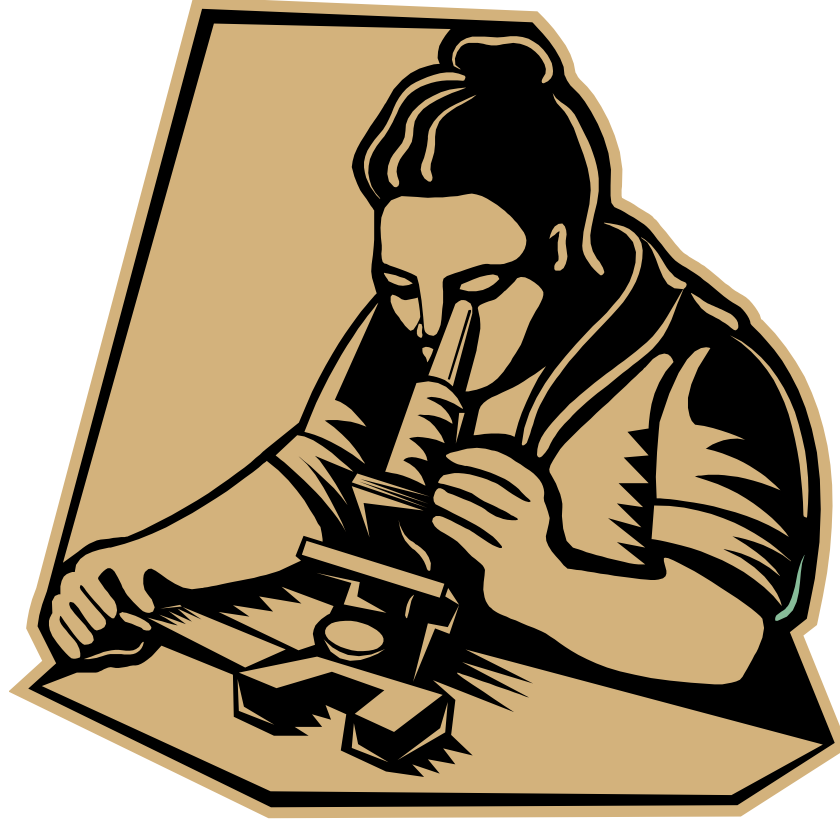
5) 0.000892

$$8.92 \times 10^{-4}$$

The nucleus of a human cell is about  $7 \times 10^{-6}$  meters in diameter. What is the length in standard notation?

**.000007**





A ribosome, another part of a cell, is about 0.000000003 of a meter in diameter. Write the length in scientific notation.

$$3 \times 10^{-9}$$