

# SCIENTIFIC NOTATION

Name \_\_\_\_\_

Scientists very often deal with very small and very large numbers, which can lead to a lot of confusion when counting zeros! We have learned to express these numbers as powers of 10.

Scientific notation takes the form of  $M \times 10^n$  where  $1 \leq M < 10$  and "n" represents the number of decimal places to be moved. Positive n indicates the standard form is larger than zero whereas negative n would indicate a number smaller than zero.

**Example 1:** Convert 1,500,000 to scientific notation.

We move the decimal point so that there is only one digit to its left, a total of 6 places.

$$1,500,000 = 1.5 \times 10^6$$

**Example 2:** Convert 0.000025 to scientific notation.

For this, we move the decimal point 5 places to the right.

$$0.000025 = 2.5 \times 10^{-5}$$

(Note that when a number starts out less than one, the exponent is always negative.)

Convert the following to scientific notation.

1.  $0.005 = 5 \times 10^{-3}$

2.  $5.050 = 5.05 \times 10^3$

3.  $0.0008 = 8 \times 10^{-4}$

4.  $1,000 = 1 \times 10^3$

5.  $1,000,000 = 1 \times 10^6$

6.  $0.25 = 25 \times 10^{-1}$

7.  $0.025 = 2.5 \times 10^{-2}$

8.  $0.0025 = 2.5 \times 10^{-3}$

9.  $500 = 5 \times 10^2$

10.  $5,000 = 5 \times 10^3$

Convert the following to standard notation.

1.  $1.5 \times 10^3 = 1500$

2.  $1.5 \times 10^{-3} = 0.0015$

3.  $3.75 \times 10^{-2} = 0.0375$

4.  $3.75 \times 10^2 = 375$

5.  $2.2 \times 10^5 = 220,000$

6.  $3.35 \times 10^{-1} = 0.335$

7.  $1.2 \times 10^{-4} = 0.00012$

8.  $1 \times 10^4 = 10,000$

9.  $1 \times 10^{-1} = 0.1$

10.  $4 \times 10^0 = 4$