

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 a large number. Negative n indicates a number between zero and one.

**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.  $0.005 =$  \_\_\_\_\_

6.  $0.25 =$  \_\_\_\_\_

2.  $5,050 =$  \_\_\_\_\_

7.  $0.025 =$  \_\_\_\_\_

3.  $0.0008 =$  \_\_\_\_\_

8.  $0.0025 =$  \_\_\_\_\_

4.  $1,000 =$  \_\_\_\_\_

9.  $500 =$  \_\_\_\_\_

5.  $1,000,000 =$  \_\_\_\_\_

10.  $5,000 =$  \_\_\_\_\_

Convert the following to standard notation.

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

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

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

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

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

8.  $1 \times 10^4 =$  \_\_\_\_\_

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

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

5.  $2.2 \times 10^5 =$  \_\_\_\_\_

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