

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.

- $0.005 = 5 \times 10^{-3}$
- $5,000 = 5.05 \times 10^3$
- $0.0008 = 8 \times 10^{-4}$
- $1,000 = 1 \times 10^3$
- $1,000,000 = 1 \times 10^6$
- $0.25 = 2.5 \times 10^{-1}$
- $0.025 = 2.5 \times 10^{-2}$
- $0.0025 = 2.5 \times 10^{-3}$
- $500 = 5 \times 10^2$
- $5,000 = 5 \times 10^3$

Convert the following to standard notation.

- $1.5 \times 10^3 = 1,500$
- $1.5 \times 10^4 = 15,000$
- $3.75 \times 10^2 = 375$
- $3.75 \times 10^3 = 3,750$
- $2.2 \times 10^5 = 220,000$
- $3.35 \times 10^{-1} = 0.335$
- $1.2 \times 10^{-4} = 0.00012$
- $1 \times 10^4 = 10,000$
- $1 \times 10^1 = 10$
- $4 \times 10^0 = 4$