SCIENTIFIC NOTATION

Name Key

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 $1 \le M < 10$ 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.
Move the decimal point so that there is only one digit to its left, a total of 6 places.

1,500,000 = 1.5×10^6

Example 2: Convert 0.00025 to scientific notation.
For this, move the decimal point 4 places to the right.

0.00025 = 2.5×10^{-4}

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

Convert the following to scientific notation.

1. 0.005 = 5×10^{-3}
2. 5,050 = 5.05×10^3
3. 0.0008 = 8×10^{-4}
4. 1,000 = 1×10^3
5. 1,000,000 = 1×10^6
6. 0.25 = 2.5×10^{-1}
7. 0.025 = 2.5×10^{-2}
8. 0.0025 = 2.5×10^{-3}
9. 500 = 5×10^2
10. 5,000 = 5×10^3

Convert the following to standard notation.

1. 1.5×10^3 = 1,500
2. 1.5×10^{-3} = 0.0015
3. 3.75×10^{-2} = 0.0375
4. 3.75×10^2 = 375
5. 2.2×10^5 = 220,000
6. 3.35×10^{-1} = 0.335
7. 1.2×10^{-4} = 0.00012
8. 1×10^4 = 10,000
9. 1×10^{-1} = 0.1
10. 4×10^0 = 4