Vocabulary: Unit Conversions 2 – Scientific Notation and Significant Digits

Vocabulary

- Resolution – a measure of the fineness with which an instrument can make a measurement.
  - A stopwatch that records time to the nearest hundredth of a second has greater resolution than a stopwatch that records time to the nearest tenth of a second.
- Scientific notation – a convenient method of writing very large or very small numbers.
  - A number in scientific notation consists of a number between 1 and 10 multiplied by a power of 10.
    - For example, 41,600,000 in scientific notation is 4.16×10^7.
- Significant digits – digits in a measured value that were directly measured or estimated.
  - A measurement should be recorded with a number of significant digits that reflects the resolution of the instrument.
  - Use the following rules to determine the number of significant digits in a measured value:

1. Any non-zero digit is significant: *227.4 has four significant digits.*
2. Any digit that is between other significant digits is significant: *200.08 has five significant digits.*
3. Zeros to the right of a significant digit *and* to the right of a decimal point are always significant: *6.00 has three significant digits.*
4. Zeros used to space a number to the right of a decimal point are *not* significant: *0.000147 has only three significant digits.*
5. In scientific notation, all digits in the coefficient are significant: *8.75 × 10^5 has 3 significant digits*.
6. Zeros to the right of a significant digit but to the left of a decimal point may or may not be significant: *875,000 has at least three significant digits, but may have as many as six.*
7. If a number ends in a decimal point, the zeros to the left of the decimal point are significant: *875,000. has six significant digits.*
8. In any calculation, the number of significant digits in the answer should equal the number of significant digits in the measurement with the least number of significant digits: *2.13 cm × 4.1 cm should have two significant digits because 4.1 has two significant digits: 2.13 cm × 4.1 cm = 8.7 cm^2.*