

## Vocabulary: Recording Data

- Absolute error – the difference between an estimated, measured, or observed value and the true value.
  - For example, if the true value is 2.00 seconds and the estimated value is 2.15 seconds, the error is 0.15 seconds.
  - Error is a number showing how much higher or lower a value is from the actual value.
  - Error can be calculated using the following formula:

$$\text{error} = \text{observed value} - \text{actual value}$$

- Accuracy – how close a measured value of a quantity is to its actual value.
- Percent error – the difference between an estimated value and the true value, expressed as a percentage.
  - To calculate percent error, divide the error by the true value and multiply by 100.
  - For example, if the true value is 2.00 seconds and the estimated value is 2.15 seconds, the percent error is:

$$\frac{0.15}{2.00} \times 100 = 7.5\%$$

- Precision – how close measured values are to each other.
  - Precision describes the degree of reliability and repeatability of a measurement.
  - A set of measurements can be very precise without being very accurate.
- Resolution – a measure of the fineness with which an instrument can make a measurement.
  - For example, 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.
- 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.