

Accuracy vs. Precision

Accuracy

- ▶ Accuracy of a measurement:
 - An indication of how close the measurement is to the accepted value
 - Percentage difference can be calculated to give a quantitative indication of a measurement's accuracy—the smaller the percentage difference, the greater the accuracy
 - Good accuracy is an indication of low systematic error.

Precision of a Measurement

- ▶ An indication of how “exactly” you can measure a piece of data
- ▶ More precise measurements are those that are measured to a smaller increment of a unit of measure (i.e. more decimal places)
 - Example: a thickness of wire measured with a meter stick will be precise to 0.01 cm; using a micrometer can increase the precision to 0.0001 cm
- ▶ ALWAYS use a measuring tool that will give you the most appropriate precision.
- ▶ Absolute uncertainty can be used to indicate the precision of your measurement

Precision of a Data Set

- ▶ an indication of the agreement among a number of measurements made in the same way (i.e. with the same measuring tool and procedure)
- ▶ The more consistent your results are, the higher the precision is
- ▶ High precision implies small amount of random error