Honors Using Measurement Notes

# A. Accuracy vs. Precision

* **Accuracy** - how close a measurement is to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Precision** - how close a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are to each other

# ACCURATE = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PRECISE = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### B. Percent Error

## Indicates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a measurement

Formula =

Sample:

A student determines the density of a substance to be 1.40 g/mL. Find the % error if the accepted value of the density is 1.36 g/mL.

### C. Significant Figures

* Indicate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a measurement.
* **Recording Sig Figs**

Sig figs in a measurement include the known digits plus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* **Counting Sig Figs** (Table 2-5, p.47)

Count all numbers EXCEPT:

* + Leading zeros -- 0.0025
  + Trailing zeros without a decimal point -- 2,500
  + Can use Atlantic/Pacific method

Counting Sig Fig Examples

1. 23.50 ⇒

2. 402 ⇒

3. 5280 ⇒

4. 0.080 ⇒

**Calculating with Sig Figs**

Multiply/Divide - The # with the fewest sig figs determines the # of sig figs in the answer.

Add/Subtract - The # with the lowest decimal value determines the place of the last sig fig in the answer.

Exact Numbers do not limit the # of sig figs in the answer.

* Counting numbers: 12 students
* Exact conversions: 1 m = 100 cm
* “1” in any conversion: 1 in = 2.54 cm

Practice Problems

5. 6.

# D. Scientific Notation

* **Converting into Sci. Notation:**

Move decimal until there’s 1 digit to its left. Places moved = exponent.

Large # (>1) ⇒ positive exponent  
Small # (<1) ⇒ negative exponent

Only include sig figs.

Practice Problems

7. 8.

9. 10.

### E. Proportions