

Ch. 1 Notes: Chemical Foundations

1.1 Overview

1.2 Scientific Method (Idealized)

A.

B. Law vs Theory

C. Scientific Method (reality)

1.3 Units of Measurement

A. Base and Derived Units

B. Prefixes to know

1.4 Uncertainty in Measurement

A. Precision vs Accuracy

B. Types of Errors

1. random

2. systematic

1.5 Significant Figures and Calculations

A. What's the difference between 6.0g and 6.00g?

B. What is “significant?”

1. Determining Significance and the zero “problem”:

Ex: 79.453g	5.00 cm
6.2 L	10,300 m
3.0007 g	.040 mL
.001 m	

2. Mult and Division with sig digits: round answer to the # of sig digits in the measurement with the _____ significant digits

$$\text{Ex: } 6.221\text{cm} \times 5.2\text{ cm} = 32.3492\text{cm}^2$$

3. Addition and Subtraction with sig digits: round to the same _____ as the _____ precise measurement

$$\text{Ex: } 5.76\text{ m} + 308.2175\text{m} = 313.9775\text{m}$$

$$27.35\text{g} - 21.2\text{g} = 6.15\text{g}$$

4. In multi-step problems, don’t do any rounding until the end!

5. Exact numbers are considered to have an infinite amount of significant digits and do not limit the amount of digits expressed in the final answer.

Ex:

6. Who cares anyway?

1.6 Dimensional Analysis (one way to solve problems)

A. Conversion Factor (or Unit Factor): fraction whose numerator and denominator are the same quantity expressed in different units (see Appendix)

B. Probs:

Ex1 My height is 66.5 inches. How many centimeters tall am I?

Ex2 My Honda Civic gets 34 miles/gallon of gas. Convert that to km/L.

Ex3 How many cubic centimeters is 4.56 cubic inches?

Ex4 $5.1 \text{ km}^3 = ? \text{ L}$

1.7 Temperature

1.8 Density

1.9 Classification of Matter

A. Definitions

1. matter:
2. pure substance:
3. mixture:
4. homogeneous mixture:
5. heterogeneous mixture:

B. Separation of Mixtures

- 1.
- 2.
- 3.
- 4.

C. Separation of Compounds

- 1.
- 2.