

CHM 110 Chapter 1 Study Guide

Chapter 1 in OpenStax deals with basic introductory material that you'll need to know before you move further into the study of chemistry. Most of this material will have been covered in high-school level introductory science courses such as high school chemistry, physics, or physical sciences. We will not specifically address all of the points in the study guide in lecture, so make sure you take good notes on chapter 1 and read through the notes provided on the web site for this material.

In chapter 1, the concept that you will need to spend the most time on is **dimensional analysis**. In chapter 1, we use dimensional analysis for converting from one unit to another, but we will later use the same kind of math to relate one chemical to another in chemical reactions. It's important that you understand dimensional analysis now, so you can use it in the future.

After completing chapter 1 in the textbook, you should be able to:

[Terminology]

- Define basic terms - mass, matter, law of conservation of matter (also called the law of conservation of mass), hypothesis, theory, law, measurement, pure substance, mixture, element, compound.
- Describe the three states of matter (solids, liquids, and gases) and their characteristics
- Distinguish between chemical and physical changes.
- Distinguish between chemical and physical properties.
- Distinguish between homogeneous and heterogeneous mixtures.
- Distinguish between elements and compounds.

[The scientific method]

- Briefly describe the scientific method.
- Describe the similarities and differences between scientific theories, scientific laws, and hypotheses.

[Significant figures]

- Explain differences between accuracy and precision.
- Explain ways to check the accuracy and/or precision of measurements.
- Determine the correct number of significant figures in a measurement you make.
- Determine the number of significant figures in a reported measurement.
- Add, subtract, multiply, and divide measurements and exact numbers and round the answer to the correct number of significant figures.

[Metric units]

- List and define common metric base units and common derived units for volume and density.
- List and define common metric prefixes (M, k, c, m, μ)
- Calculate density of a liquid from experimental data.
- Calculate density of a solid object from experimental data.

[Dimensional analysis]

- Write conversion factors for metric units using metric prefixes.
- Convert from one metric unit to another using dimensional analysis.
- Convert between English and metric units using dimensional analysis.

[Suggested Chapter 1 review problems - from pages 54-65 at the end of the chapter]

- 3, 9, 11, 17, 23, 25, 27, 37, 41, 47, 49, 51, 53, 72, 81

Answers to odd-numbered problems are found at the back of the OpenStax textbook!