

## States of Matter Unit Overview

### Objective

The world around us is filled with matter in all different physical states. This unit explores the physical and chemical nature of each of those states using kinetic molecular theory, phase diagrams, and other means of interpreting changes of state.

### Background

Dingrando, et al. *Chemistry: Matter and Change*, Indiana ed. Ch. 13

### Objectives and Goals

You will be able to:

- Define and identify the states of matter using kinetic molecular theory.
- Explain the principles of gas pressure and the properties of ideal gases.
- Identify and explain each of the changes of state (melting, freezing, condensation, vaporization, sublimation, deposition).
- Interpret and identify the components of a phase diagram, including critical point, triple point, etc.

### Rationale

The purposes of the states of matter unit are twofold: 1) to serve as review of previously covered material on matter from the first semester, and 2) to serve as background for the upcoming chapter on the behavior of gases. In addition, states of matter meets the following Indiana academic standards for Chemistry I:

C.1.2 Determine the properties and quantities of matter such as mass, volume, temperature, density, melting point, boiling point, conductivity, solubility, color, numbers of moles, and pH, and designate these properties as either extensive or intensive.

C.1.26 Describe the physical changes and properties of matter through sketches and descriptions of involved materials.

C.1.31 Use kinetic molecular theory to explain changes in gas volumes, pressure, and temperature.

## Unit Format

This is a self-guided unit in which you are allowed to work at their own pace throughout. All unit materials are due by the day of the test, but you may turn their work in at any time prior to that date for feedback.

## Organization

An outline and schedule is provided to help you organize their work and stay on task. You will be responsible for much of your own learning and time management throughout this unit. It is vital that you find a way to keep track of assignments and complete them in a timely manner. The Assignment Checklist and Assignment Schedule are meant to help you do this.

## Lecture

A short amount of notes on important topics will be provided at the beginning of the class period on selected days. These notes will be short and focused on a more challenging or important topic.

## Independent/Peer Work Time

Much of the time spent on this unit will be done independently or working in small groups. You will be responsible for making sure you complete the notes, assignments, and labs. You must complete all of the required assignments. After that you may choose 5 of the optional assignments to complete. Any of the remaining optional assignments may be completed for a total of two points of extra credit each.

**You should try to turn in at least two or three items per day so that you can complete the unit on time.**

## Recitation

At the end of most class periods throughout the unit a recitation will be provided. Recitation literally means a repetition of what has been said before. In a science course, recitations are commonly used as a supplement to the regular notes and topics of the course. This is a time where the entire class can ask questions, and we can all discuss and expand on the topics you are studying in the unit.

## Academic Integrity

You are expected to complete your own work throughout this unit even while working with a partner or in groups. It is not acceptable to divide work up amongst several people or to copy work. The penalty for any academic dishonesty will be a zero for the assignment.

## Evaluation

The unit will consist of the following assessments which you must complete:

- 5 required assignments
- 5 optional assignments
- States of Matter Exam