

Course Description:

Physical Science A is the first semester of a high school level physical science course. The course introduces students to the world of chemistry. Students start by looking at science as a whole. This means learning the methods and tools that scientists use to get meaningful results. Students then explore the structure and properties of matter—and how it changes in response to energy. Next, students practice reading and interpreting the periodic table. From there, students learn to use and interpret chemical names, formulas, equations, and models. Students also discover the types and properties of reactions, mixtures, solutions, acids, and bases. Finally, students will examine nuclear reactions and their uses. Throughout the course, students also explore historical perspectives and the modern social impact of these topics.

Course Objectives:

- Apply scientific processes to conduct investigations.
- Use logical thinking to identify relationships and draw conclusions.
- Examine how investigations and research in chemistry are important to gaining historical perspective and understanding the societal value of scientific advances.
- Evaluate topics in chemistry to better understand the nature of science, the basics of matter, how the elements are organized, how and why chemicals react to form new substances, the properties of mixtures, solutions, acids, and bases, and how nuclear technology has impacted society.

Required Materials:

In course.

Course Overview:

Unit 1 Overview

In this first unit, students will brush up on their science skills and knowledge as they learn about scientific thinking, the scientific process, classifications of matter, and physical and chemical properties. No matter what they already know about science, this unit will help them build on that knowledge to better understand the concepts for this course.

Unit 2 Overview

In this unit, students will learn how matter can transition into different states and how energy and mass are conserved during those changes. Also, students will learn what scientists have discovered about the properties and behaviors of fluids. Finally, students will learn about the structure of atoms, as well as some of the many theories that have shaped our current scientific understanding of atoms.

Unit 3 Overview

In this unit, students will learn about the periodic table and how it organizes elements into connected groups. Knowing how to interpret the periodic table will help students better understand elements and even predict their properties.

Unit 4 Overview

In this unit, students will learn about chemical reactions and equations, the energy in them, and about chemical equilibrium. Then they will advance to learning about a different type of chemical reaction: nuclear

reactions. They will discover how radioactive elements, half-life, fission, fusion, and nuclear medicine connect to nuclear reactions.

Unit 5 Overview

In this unit, students will learn about mixtures, their components, how substances dissolve, and the factors that affect a substance's dissolving rate. Students will also discover ways to characterize mixtures of different concentrations. Once they have mastered these concepts, they will move forward to learning about the properties of acids and bases and how these substances behave in aqueous (or water-based) solutions.

Unit 6 Overview

In this last unit, students will spend some time examining how scientists apply their knowledge and curiosity to new research. One area of science that still requires scientific research is the harnessing of nuclear energy. Students will take a Final Exam.