TPHS Course Profile
Honors Chemistry in the Earth System

Grade Level(s) 10-12 (10 Credits)

- *Meets high school graduation requirement for Physical science*
- *Meets the UC/CSU subject area "D" Lab Science requirements*

General Information

Description

This course is aligned to the Next Generation Science Standards (NGSS) for Chemistry in the Earth System. It is an advanced college preparatory course designed to survey general chemistry concepts and their relationship to Earth systems. Students will explore the nature of matter, its properties, and its relationship to energy. They will investigate the formation of the first elements and their transformation to heavier elements in the context of stars. They will use this knowledge to explore the structure of an atom and patterns in the periodic table. Students will investigate the forces that hold matter together and how society uses its understanding of elements and molecules to develop useful materials. Students will explore the interactions of elements and molecules as illustrated by chemical reactions. Students will investigate Earth's atmosphere and climate system. Students will explore the factors that drive chemical and physical changes based on their understanding of elements and materials science. They will examine connections between matter and energy into and out of chemical systems, extending the concept to the movement of energy through Earth's systems and ways humans may control these movements. Students will investigate these concepts in the context of greenhouse gases, their effect on the atmosphere, and the stability and changes of the chemistry of the ocean and other bodies of water on Earth.

The Honors curriculum will include topics beyond the NGSS standards including quantum mechanics, spectroscopy, advanced intermolecular forces, thermodynamics and equilibrium.
Advanced science skills included in the honors curriculum:

1. Building multi-level problem solving skills.
2. Integration of mathematics as a predictive tool.
3. Formation of frameworks for solving word problems and data analysis in comparison to accepted scientific principles.
4. Laboratory investigation safety, methods, equipment use, and analytical skills.
5. Describing relationships and making arguments using scientific reasoning and evidence.

Expectations and Goals

Honors Chemistry requires a 11th grade level reading comprehension and a strong work ethic for consistent out of class assignments. A strong background in algebra is essential for success. Essays, examinations, projects (computer and written) and laboratory work are requirements for course completion, in addition to maintaining an organized binder.

Estimated Homework

Honors Chemistry homework consists of critical reading assignments, mathematical computations, lab data analysis, and data expression in charts and graphs. Estimated homework times will vary based on the background knowledge of each student, but is estimated at **1** hour for each **class period**.

This Class Is Best For…

Students who have completed Biology with an A or B grade. Any student planning to enroll in an Advanced Placement (AP) science course should enroll in Honors Chemistry.

Course Materials

Suggested Materials

- Suggested Materials include a scientific, non-graphing calculator and a 3-ring binder with organized tabs.