

Geophysical Science CP Course Overview

The Geophysical Science curriculum meets the requirements of the Next Generation Science Standards for Earth and Space Science. It also helps to prepare students to exceed the standards assessed through NJ mandated state assessments by higher order application of various skills required for complete understanding of Geophysical Science. The high school performance expectations build on the middle school ideas and skills and allow high school students to explain more in-depth phenomena central not only to the earth and space sciences, but to physical sciences as well. These performance expectations blend the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain ideas across the science disciplines. The performance expectations in ESS1: Earth's Place in the Universe, help students formulate an answer to the question: "What is the universe, and what is Earth's place in it?" The ESS1 Disciplinary Core Idea is broken down into three sub-ideas: the universe and its stars, Earth and the solar system and the history of planet Earth. Students examine the processes governing the formation, evolution, and workings of the solar system and universe. Some concepts studied are fundamental to science, such as understanding how the matter of our world formed during the Big Bang and within the cores of stars. Others concepts are practical, such as understanding how short-term changes in the behavior of our Sun directly affect humans. Engineering and technology play a large role here in obtaining and analyzing the data that support the theories of the formation of the solar system and universe. The crosscutting concepts of patterns, scale, proportion, and quantity, energy and matter, and stability and change are instrumental in organizing concepts for these disciplinary core ideas. In the ESS1 performance expectations, students are expected to demonstrate proficiency in developing and using models, using mathematical and computational thinking, constructing explanations and designing solutions, engaging in argument, and obtaining, evaluating and communicating information; and to use these practices to demonstrate understanding of the core ideas. The performance expectations in ESS2: Earth's Systems, help students formulate an answer to the question: "How and why is Earth constantly changing?" The ESS2 Disciplinary Core Idea from the NRC Framework is broken down into five sub-ideas: Earth materials and systems, plate tectonics and large-scale system interactions, the roles of water and other agents of erosion in Earth's surface processes. Students develop models and explanations for the ways that feedbacks between different Earth systems control the appearance of Earth's surface. Central to this is the tension between internal systems, which are largely responsible for creating land at Earth's surface, and the Sun-driven surface systems that tear down the land through weathering and erosion. The crosscutting concepts of cause and effect, energy and matter, structure and function and stability and change are called out as organizing concepts for these disciplinary core ideas. In the ESS2 performance expectations, students are expected to demonstrate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, and engaging in argument; and to use these practices to demonstrate understanding of the core ideas.