

Year at a Glance – Ninth Grade Science (Integrated Science 1)

Guiding Crosscutting Concept: Interactions between the biosphere and the rest of Earth’s systems occur at various **scales of time and size.**

Official 2019-20 Version

What Students Learn

“Evolutionary change is a powerful framework for studying our world and our place therein. The universe, the planet Earth, life, human technologies, and science all change, although on vastly different scales. Evolution offers scientific answers to the age-old question, ‘Where did we come from?’” (taken from SETI Voyages Through Time)

Students should be able to answer the following questions by the end of the course:

- How did the planet form? When and how did life evolve? How do earth (abiotic components) and life (biotic components) coevolve?
- How is energy conserved and transferred among living things? How do environmental pressures lead to evolution? How do humans impact the earth?

Units	Key Learning Outcomes
1. Planetary Formation and Evolution	<ul style="list-style-type: none"> ● HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: 1) the potential for a species to increase in number 2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction 3) competition for limited resources and 4) the proliferation of those organisms that are better able to survive and reproduce in the environment. ● HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. ● HS-PS1-2: Construct and revise an explanation for the outcome of a simple chemical reactions based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. ● HS-LS1-6: Construct and revise an explanation based on evidence for how carbon, hydrogen and oxygen from sugar molecules may combine with other elements to form amino acids an/or other large carbon-based molecules. ● HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. The carbon cycle is a property of the Earth system that arises from interactions among the hydrosphere, atmosphere, geosphere, and biosphere. ● HS-PS2-1: Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. ● HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems.
2. Matter and Its Interactions	
3. Coevolution of Life and Earth	
4. Cycles and Energy	
5. Environmental Pressures Affecting Life	