Indiana Science

Earth and Space Science: Grades 9, 10, 11, 12

Adopted 2022

Earth's Place in the Universe	HS-ESS1-1.	Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. HS-ESS1-1
	HS-ESS1-2.	Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. HS-ESS1-2
	HS-ESS1-3.	Communicate scientific ideas about the way stars, over their life cycle, produce elements. HS-ESS1-3
	HS-ESS1-4.	Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. [HS-ESS1-4
	HS-ESS1-5.	Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. HS-ESS1-5
	HS-ESS1-6.	Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. HS-ESS1-6
Earth's Systems	HS-ESS2-1.	Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. [HS-ESS2-1
	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. HS-ESS2-2
	HS-ESS2-3.	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. HS-ESS2-3
	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. HS-ESS2-4

	HS-ESS2-5.	**Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.** HS-ESS2-5
	HS-ESS2-6.	**Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.** HS-ESS2-6
	HS-ESS2-7.	**Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.** HS-ESS2-7
	HS-ESS2-8.	**Construct an explanation of how heat (energy) and water (matter) move throughout the oceans causing patterns in weather and climate.** HS-ESS2-8
	HS-ESS2-9.	**Construct an explanation for how energy from the Sun drives atmospheric processes and how atmospheric currents transport matter and transfer energy.** HS-ESS2-9
Human Interaction with Earth's Systems	**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-ESS3-1
	HS-ESS3-2.	**Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.** HS-ESS3-2
	HS-ESS3-3.	**Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.** HS-ESS3-3
	HS-ESS3-4.	**Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.** HS-ESS3-4
	HS-ESS3-5.	**Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.** HS-ESS3-5
	HS-ESS3-6.	**Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.** HS-ESS3-6