Science: Earth Science

EARTH'S PLACE IN THE UNIVERSE	1a	Describe components of a model illustrating that the sun shines because of nuclear fusion reactions which release light and heat energy which make life on Earth possible. LC-HS-ESS1-1A
	3a	Communicate by using models that solar activity creates elements through nuclear fusion. LC-HS-ESS1-3A
	4a	Recognize that objects in the solar system orbit the sun and have an orderly motion (e.g., elliptical paths around the sun). LC-HS-ESS1-4A
	4b	Relate Earth's orbital characteristics to other bodies in the solar system. LC-HS-ESS1-4B
	4c	Use a mathematical or computational representation to predict the motion of orbiting objects in the solar system. LC-HS-ESS1-4C
	5a	Explain the relationship between the motion of continental plates and how materials of different ages are arranged on Earth's surface. LC-HS-ESS1-5A
	5b	Relate/evaluate evidence of past and/or current movements in Earth's crust (plate tectonics) with the ages of crustal rocks. LC-HS-ESS1-5B
HISTORY OF EARTH	6a	Identify ancient Earth materials, lunar rocks, asteroids, and meteorites as sources of evidence scientists use to understand Earth's early history. LC-HS-ESS1-6A
SPACE SYSTEMS	2a	Identify that the universe is expanding and must have been smaller in the past based on astronomical evidence (i.e., light spectra, motion of distant galaxies, and composition of matter in the universe). LC-HS-ESS1-2A
EARTH'S SYSTEMS	1a	Use a model of Earth to identify that the motion of the mantle and its plates occurs primarily through thermal convection, which is primarily driven by radioactive decay within Earth's interior. LC-HS-ESS2-1A
	2a	Identify relationships, using a model, of how the Earth's surface is a complex and dynamic set of interconnected systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere). LC-HS-ESS2-2A

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		radioactive decay within Earth's interior. LC-HS-ESS2-3A
	4a	Identify different causes of climate change and results of those changes with respect to the Earth's surface temperatures, precipitation patterns or sea levels over a wide range of temporal and spatial scales using a model. LC-HS-ESS2-4A
	5a	Identify a connection between the properties of water and its effects on Earth materials. LC-HS-ESS2-5A
	5b	Investigate the effects of water on Earth materials and/or surface processes. LC-HS-ESS2-5B
	6a	Use a model of photosynthesis to identify that carbon is exchanged between living and nonliving systems. LC-HS-ESS2-6A
	6b	Use a model of cellular respiration to identify that carbon is exchanged between living and nonliving systems. LC-HS-ESS2-6B
	6c	Develop and/or use a quantitative model to identify relative amount of and/or the rate at which carbon is transferred among hydrosphere, atmosphere, geosphere, and biosphere. LC-HS-ESS2-6C
	7a	Identify examples of coevolution of Earth's systems and the evolution of life on Earth. LC-HS-ESS2-7A
	7b	Identify evidence (e.g., causal links and/or feedback mechanisms between changes in the biosphere and changes in Earth's other systems) in an argument that there is simultaneous coevolution of Earth's systems and life on Earth. LC-HS-ESS2-7B
HUMAN SUSTAINABILITY	1a	Explain the relationship between human activity (e.g., population size, where humans live, types of crops grown) and changes in the amounts of natural resources using evidence. LC-HS-ESS3-1A
	1b	Explain the relationship between human activity (e.g., population size, where humans live, types of crops grown) and changes in the occurrence of natural hazards using evidence. LC-HS-ESS3-1B
	2a	Identify a solution that demonstrates the most preferred cost-benefit ratios for developing, managing, and utilizing energy and mineral resources (i.e., conservation, recycling, and reuse of resources). LC-HS-ESS3-2A
	2b	Compare design solutions for developing, managing, and/or utilizing energy or mineral resources. LC-HS-ESS3-2B
	3a	Use numerical data to determine the effects of a conservation strategy to manage natural resources and to sustain human society and plant and animal life. LC-HS-ESS3-3A

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4a **Connect a technological solution (e.g., wet scrubber; baghouse) to its outcome (e.g., clean air) and its outcome to the human activity impact that it is reducing (e.g., air pollution).** LC-HS-ESS3-4A

5a **Use geoscience data to determine the relationship between a change in climate (e.g., precipitation, temperature) and its impact in a region.** LC-HS-ESS3-5A

6a **Use representations to describe the relationships among Earth systems and how those relationships are being modified due to human activity (e.g., increase in atmospheric carbon dioxide, increase in ocean acidification, effects on organisms in the ocean (coral reef), carbon cycle of the ocean, possible effects on marine populations).** LC-HS-ESS3-6A