

Earth Science Power Standards and I Can Statements

HSCE	Description	Unit	Clarification	I Can Statement
E2.1B	Analyze the interactions between the major systems (geosphere, atmosphere, hydrosphere, biosphere) that make up the Earth.	1	Interactions take the form of energy transfer and movement of matter.	<p>I can analyze the movement of energy with in the geosphere.</p> <p>I can analyze the movement of energy with in the hydrosphere.</p> <p>I can analyze the movement of energy with in the biosphere.</p> <p>I can analyze the movement of energy with in the atmosphere</p>
E2.2C	Describe natural processes in which heat transfer in the Earth occurs by conduction, convection, and radiation.	2	Convection occurs in the Earth’s mantle. Several models of the geometry of convection have been constructed without a consensus in the science community. Rising heat is associated with spreading centers.	<p>I can describe the natural processes that occur in the earth due to conduction.</p> <p>I can describe the natural processes that occur in the earth due to convection.</p> <p>I can describe the natural processes that occur in the earth due to radiation.</p>
E3.2A	Describe the interior of the Earth (in terms of crust, mantle, and inner and outer cores) and where the magnetic field of the Earth is generated.	2		<p>I can describe the interior of the earth and identify the layers.</p> <p>I can explain where the magnetic field is generated.</p>

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E3.3A	Explain how plate tectonics accounts for the features and processes (sea floor spreading, mid-ocean ridges, subduction zones, earthquakes and volcanoes, mountain ranges) that occur on or near the Earth's surface.	3		<p>I can identify and explain sea floor spreading.</p> <p>I can identify and explain mid-ocean ridges.</p> <p>I can identify and explain subduction zones.</p> <p>I can explain how earthquakes occur as a results of plate tectonics.</p> <p>I can explain how volcanoes occur as a results of plate tectonics.</p> <p>I can explain how mountain ranges occur as a results of plate tectonics.</p>
E3.1A	Discriminate between igneous, metamorphic, and sedimentary rocks and describe the processes that change one kind of rock into another.	4	In addition physical characteristics, discrimination can involve an understanding of the processes and environments of rock formation. Rock forming processes can be understood in a plate tectonics context.	<p>I can compare and contrast igneous, sedimentary and metamorphic rocks.</p> <p>I can describe the processes within the rock cycle.</p> <p>I can describe how one rock can change into another.</p>
E5.3B	Describe the process of radioactive decay and explain how radioactive elements are used to date the rocks that contain them.	5		<p>I can describe the process of radioactive decay.</p> <p>I can explain how radioactive elements are used to date rocks.</p>

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E4.3A	Describe the various conditions of formation associated with severe weather (thunderstorms, tornadoes, hurricanes, floods, waves, and drought).	6		<p>I can describe the conditions of formation associated with thunderstorms.</p> <p>I can describe the conditions of formation associated with tornadoes.</p> <p>I can describe the conditions of formation associated with hurricanes.</p> <p>I can describe the conditions of formation associated with floods.</p> <p>I can describe the conditions of formation associated with waves.</p> <p>I can describe the conditions of formation associated with drought.</p> <p>I can describe the damage and impact associated with severe weather.</p>
E4.2A	Describe the major causes for the ocean’s surface and deep water currents, including the prevailing winds, the Coriolis effect, unequal heating of the earth, changes in water temperature and salinity in high latitudes, and basin shape.	7		<p>I can describe the cause of surface currents in the ocean.</p> <p>I can describe the cause of deep water currents in the ocean.</p>

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E5.4A	Explain the natural mechanism of the greenhouse effect including comparisons of the major greenhouse gases (water vapor, carbon dioxide, methane, nitrous oxide, and ozone).	8		I can explain the greenhouse effect. I can compare and contrast major greenhouse gases.
E4.1A	Compare and contrast surface water systems (lakes, rivers, streams, wetlands) and groundwater in regard to their relative sizes as Earth's freshwater reservoirs and the dynamics of water movement (inputs and outputs, residence times, sustainability).	9		I can compare and contrast surface and ground water system in regard to size. I can compare and contrast surface and ground water system in regard to water movement.
E2.4A	Describe renewable and nonrenewable sources of energy for human consumption (electricity, fuels), compare their effects on the environment, and include overall costs and benefits.	10	All sources of energy used for human consumption have benefits, costs and environmental impact. Detailed and quantified comparisons allow for more informed decisions about the tradeoffs involved	I can describe renewable sources of energy for human consumption. I can describe nonrenewable sources of energy for human consumption. I can compare the effects of renewable and nonrenewable resources on the environment. I can compare the costs and benefits of renewable and nonrenewable resources on the environment. I can explain the impact of human activities on the environment.

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E5.1A	Describe the position and motion of our solar system in our galaxy and the overall scale, structure, and age of the universe.	11		<p>I can describe the position of our solar system in our galaxy.</p> <p>I can describe the motion of our solar system in our Galaxy.</p> <p>I can describe the scale of our solar system in our galaxy.</p> <p>I can describe the structure of our solar system in our galaxy.</p> <p>I can describe the age of our solar system in our galaxy.</p> <p>I can describe the big bang theory.</p> <p>I can explain how the solar system formed.</p>
E5.2A	Identify patterns in solar activities (sunspot cycle, solar flares, solar wind).	12	The solar wind moves outward from the sun in a pinwheel shaped spiral pattern in a more or less steady flow. The number of sunspots increases and decreases in cycles that last from 6-17 years (averaging 11 years). Solar flares accompany increases in sunspot activity.	<p>I can identify patterns in sunspot cycles.</p> <p>I can identify patterns in solar flares.</p> <p>I can identify patterns in solar winds.</p> <p>I can describe how nuclear fusion produces energy in the sun.</p>