

HCPS Earth and Environmental Systems Course

Unit & Title	MSDE/NGSS Science Standards	Lesson Topic	
Unit 1 – Earth in the Universe <i>11 Class Periods</i>	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-ESS1-3 : Communicate scientific ideas about the way stars, over their life cycle, produce elements.	1A Experience 1	Nucleosynthesis
		1A Experience 2	Spectroscopy
		1A Experience 3	Stellar Evolution
		1A Experience 4	Hubble’s Law
		1B Experience 5	Radiometric Dating
		1B Experience 6	Impact & Earth's History

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Unit 2 – Earth Systems <i>23 Class Periods</i>	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-ESS2-1 : Develop a model to illustrate how Earth’s internal and surface processes operate at different spatial and temporal	2A Experience 1	Albedo Lab
		2A Experience 2	Impact of Oceans on Air Temperature
		2A Experience 3	Earth's Interior

<p>scales to form continental and ocean-floor features.</p> <p>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.</p> <p>HS-ESS2-3: Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.</p> <p>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.</p> <p>HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p>	2B Experience 4	Lithospheric Rock Ages
	2B Experience 5	Aging Crustal Rock
	2B Experience 6	Plate Boundaries
	2B Experience 7	Hot Spot Geology
	2C Experience 8	Modeling Erosion
	2C Experience 9	Freezing and Melting
	2D Experience 10	Carbon Cycle
	2D Experience 11	Earth Cycles

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Unit 3 – Earth and Human Activity 33 Class Periods	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.	3A Experience 1	Surface Mining Simulation
		3A Experience 2	Bioenergy Farm Game

<p>HS-ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.</p> <p>HS-ESS3-3: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.</p> <p>HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</p> <p>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.</p> <p>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.</p>	3A Experience 3	Fisheries and Seafood Consumption
	3A Experience 4	Managing Self-Sustaining Colony
	3B Experience 5	Community Resilience
	3B Experience 6	Land and People Finding a Balance
	3C Experience 7	Green Town
	3C Experience 8	Mitigating Beach Erosion
	3D Experience 9	Hurricane Katrina
	3D Experience 10	Climate Change Seminar
	3D Experience 11	Earth's Dynamically Changing Climate