

____Grade Curriculum Map

TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	NOTES
<u>Ecosystems</u>	• Ecology (Food webs, biodiversity, roles in the environment) • Energy flow (pyramid, energy loss, sources, producers/consumers) • Diversity (interesting creatures, evolution/natural selection and its pressures, extinction, human involvement) • Natural change (succession, organism movement, cataclysmic events – volcanism, plate tectonics, asteroids, planetary shifts) • Biogeochemical changes (Cycles of matter, nitrification, Eutrophication)	• Construct a food web • Observe and record information about natural ecological change • Test and identify certain substances in soil and water • Find, identify, and record information on local species	•	•

	STANDARDS: <u>HS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics</u> Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. <u>HS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics</u> Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. <u>HS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics</u> Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. <u>HS-LS2-6 Ecosystems: Interactions, Energy, and Dynamics</u> Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. <u>HS-LS4-1 Biological Evolution: Unity and Diversity</u> Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.			
<u>Earth systems</u>	• Overview (Matter, energy, feedback, earth system hierarchy) • Atmosphere (layers, Climate, earth astronomy, the sun) • Water (oceans, rivers, lakes, water cycle, uses, storage) • Dirt and rock	• Develop a model of earth using data for each layer • Take and record data on local rivers and streams • Analyze compositions of soil and compare different locations	•	•

	(Weathering, Rock cycle, nutrients, soil types, soil chemistry, plate tectonics, earth structure)			
	STANDARDS: <u>HS-ESS2-3 Earth's Systems</u> Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection. <u>HS-ESS2-2 Earth's Systems</u> Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. <u>HS-ESS2-6 Earth's Systems</u> Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.			
<u>Land and water use</u>	- Agriculture (History, Nutrition, Fertilizer, pesticides, GMO, Irrigation, genetic diversity) - Forestry (Forests, ranges, public spaces, threats) - Land use (Development, conservation, Ecosystem impacts) - Mining (processing, ores/minerals,	Test local water and soil samples for evidence of agricultural runoff Identify and label local forest trees Catch and identify local fish Compare and develop cost benefit analysis for environmental		

	Legislation, history, types of mining, impacts) • Fishing (techniques, overfishing, regulation, aquaculture) • Environmental economics (economics, resources, sustainability, GPI) •	projects		
STANDARDS: <u>HS-ESS2-5 Earth's Systems</u> Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. <u>HS-ESS3-1 Earth and Human Activity</u> 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. <u>HS-ESS3-3 Earth and Human Activity</u> Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. <u>HS-ESS3-4 Earth and Human Activity</u> Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* <u>HS-ESS3-5 Earth and Human Activity</u> 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.				

	<u>HS-ESS3-6 Earth and Human Activity</u> Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. <u>HS-LS2-7 Ecosystems: Interactions, Energy, and Dynamics</u> Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* •			
<u>Populations</u>	• Basics (population, influence factors, density, carrying capacity, population ecology) • Human population (history, industrialization and technology, growth/decline, overpopulation, age demographics, impact on us and the environment	• Predict carrying capacity of local organisms using available data • Extrapolate human impacts on the environment using population data	•	•
	STANDARDS: •			

<u>Energy</u>	• Energy basics (Types, Units, thermodynamics laws, Power, turbines) • Sources and consumption (Human consumption, change over time) • Fossil fuel (Types, Formation, pros/cons) • Nuclear (Fission & fusion, pros/cons, radiation, reactors) • Hydroelectric (types, pros/cons, history) • Reduction (efficiency, design, conservation) • Renewable energy (biomass, hydrogen, geothermal, solar, hydroelectric, wind)	• Research and summarize different forms of energy production • Estimate local energy costs • Compare and create cost benefit analysis for alternative energy sources	•	•
STANDARDS: <u>HS-ESS3-2 Earth and Human Activity</u> Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.* <u>HS-PS3-3 Energy</u> Design, build, and refine a device that works within given constraints to convert one form of energy into another				

	form of energy.*			
<u>Pollution</u>	• Air (Sources, Controls, Pollutants, Smog, Technology) • Water (sources, controls, water quality, Pollutants, categories, technology) • Solid waste (types, regulation, reduction, disposal) • Health impacts (Types of diseases, LD50, bioaccumulation)	• Identify sources of common pollutants • Examine methods used to reduce pollution impact on the environment • Examine the procedures and skills necessary to remediate polluted areas	•	•
	STANDARDS: •			
<u>Global change</u>	• Ozone (UV light, CFC's, Ozone layer) • Climate change (Greenhouse effect, greenhouse gases,	• Analyze policies, laws, and regulations that impact the environment on	•	•

	impacts, laws/regulations) • Biodiversity loss (Variety, benefits, loss) •	the global scale • Familiarize local laws to better protect the lan around us		
	STANDARDS: HS-ESS2-4 Earth's Systems 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-ETS1-3 Engineering Design Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. •			
Secondary skills: Outdoor survival Fire, water, shelter, signaling, Navigation skills Environmental law Regulations, laws, policies, and public opinions Energy Power generation, energy flow in an ecosystem, consequences and benefits Pollution Types, effects on nature, Creation, recycling, and removal Conservation programs How they work, major organizations, funding, and policies Ecological professions Jobs, industry, and areas of study Agriculture Crops, pesticides, land use, feeding the world Population control Hunting, tracking, records and data collection Climate and weather				

Basics, natural disasters, problems and solutions

Diseases

Types, spread, tracking, and effects

Plastic

Creation, solutions, problems, recycling