



SPRING GROVE AREA SCHOOL DISTRICT



PLANNED COURSE OVERVIEW

Course Title: Earth Science Grade Level(s): 10 - 12 Units of Credit: 1 Classification: Elective	Length of Course: Full Year Periods Per Cycle: 6 Length of Period: 40 Minutes Total Instructional Time: 120 Hours
--	--

Course Description

Students will learn about Earth and the intricate workings of Earth's systems. Major topics covered include the history of Earth and the formation of Earth's features, Earth's systems and the cycling of matter, weather and climate, and human impact/sustainability on Earth and Earth's resources.

Instructional Strategies, Learning Practices, Activities, and Experiences

Instructional Strategies and Practices: Posted Objectives and Agendas Bell Ringers APL strategies Science and Engineering Practices Guided Practice	Strategies and Practices: Online Tutorials and Resources Critical Thinking Inquiry Questioning Technology Apps Review Games	Activities and Experiences: Inquiry Laboratory Activities Outside Observation Discussion Groups
---	---	---

Assessments

Formative Assessments: Student Worksheets Class Discussion Exit Tickets	Summative Assessments: Unit Examinations Midterm and Final Exams Unit Projects	
---	--	--

Materials/Resources

Classroom Sets of Texts Models and Props Schoology Classroom	Power Point Note Presentations Online Support Resources Laboratory Resources and Equipment	Worksheets Videos
--	--	----------------------

Adopted: 5/22/23

Revised:

Composition of Earth	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Introduction to Earth Science What is Earth Science? Understanding Maps Remote Sensing Matter and Change Matter Combining Matter States of Matter Minerals What is a Mineral? Types of Minerals Rocks Igneous Rocks Sedimentary Rocks Metamorphic Rocks</p>	<p>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-ESS 1-6 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-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-ESS2-2 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-ESS2-5 Plan and construct an investigation of the properties of water and its effects on Earth materials and surface processes. HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. 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-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. HS-ESS3-3 Create a computational simulation to illustrate the relationships among the management of natural resources, sustainability of human populations, and biodiversity. HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</p>

Surface Processes on Earth	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Weathering, Erosion, and Soil Weathering Erosion and Deposition Soil</p> <p>Mass Movements, Wind, and Glaciers Mass Movements Wind Glaciers</p> <p>Water Surface Water Movement Streams, Lakes, and Wetlands Groundwater Groundwater Weathering and Deposition</p>	<p>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.</p> <p>HS-ESS 1-6 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.</p> <p>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.</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-ESS2-5 Plan and construct an investigation of the properties of water and its effects on Earth materials and surface processes.</p> <p>HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p> <p>HS-ESS2-7 Construct an argument based on evidence about the simultaneous coevolution of Earth’s systems and life on Earth.</p> <p>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.</p> <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 the management of natural resources, 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>

The Atmosphere and The Oceans	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Atmosphere</p> <ul style="list-style-type: none"> Atmospheric Basics Properties of the Atmosphere Clouds and Precipitation <p>Meteorology</p> <ul style="list-style-type: none"> The Causes of Weather Weather Systems Gathering Weather Data Weather Analysis and Prediction <p>The Nature of Storms</p> <ul style="list-style-type: none"> Thunderstorms Severe Weather Tropical Storms Impact of Human Activities <p>Climate</p> <ul style="list-style-type: none"> Defining Climate Climate Classification Climatic Changes and Patterns Impact of Human Activities <p>Earth's Oceans</p> <ul style="list-style-type: none"> An Overview of Oceans Ocean Movements Shoreline and Seafloor Features 	<p>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.</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-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth's systems results in changes in climate.</p> <p>HS-ESS2-5 Plan and construct an investigation of the properties of water and its effects on Earth materials and surface processes.</p> <p>HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p> <p>HS-ESS2-7 Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.</p> <p>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.</p> <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-ESS3-5 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>

<p>The Dynamic Earth</p>	
<p>CONTENT/KEY CONCEPTS</p>	<p>OBJECTIVES/STANDARDS</p>
<p>Plate Tectonics Drifting Continents Seafloor Spreading Plate Boundaries Causes of Plate Motions Volcanism Volcanoes Eruptions Intrusive Activity Earthquakes Forces within Earth Seismic Waves and Earth's Interior Measuring and Locating Earthquakes Earthquakes and Society Mountain Building Crust-Mantle Relationships Orogeny Other Types of Mountain Building</p>	<p>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-ESS 1-6 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-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-ESS2-2 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-ESS2-3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. 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.</p>

Geologic Time	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Fossils and the Rock Record The Rock Record Relative-Age Dating Absolute-Age Dating Fossil Remains Geologic Time Scale Early Earth The Atmosphere, Oceans, and Early Life on Earth The Paleozoic Era The Mesozoic Era The Cenozoic Era</p>	<p>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-ESS 1-6 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-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-ESS2-2 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-ESS2-5 Plan and construct an investigation of the properties of water and its effects on Earth materials and surface processes. HS-ESS2-7 Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.</p>

Resources and The Environment	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Earth's Resources</p> <ul style="list-style-type: none"> Natural Resources Land Resources Air Resources Water Resources Energy Resources <p>Human Impact on Resources</p> <ul style="list-style-type: none"> Populations and The Use of Natural Resources Human Impact on Land Resources Human Impact on Air Resources Human Impact on Water Resources Human Impact on Energy Resources 	<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 results in changes in climate.</p> <p>HS-ESS2-5 Plan and construct an investigation of the properties of water and its effects on Earth materials and surface processes.</p> <p>HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p> <p>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.</p> <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 the management of natural resources, 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>

<https://springgroveareascho.sharepoint.com/sites/PrivateSGASD/Shared Documents/AASG/NEWCURR/SCIENCE/2023/HS Science Elective Courses/Earth Science/Earth Science Curriculum .docx>