

Wyoming Department of Education Required Virtual Education Course Syllabus

2201000 - Washakie County School District No. 1

Program Name	Washakie #1 Online	Content Area	SC
Course ID	W03001G0.5012	Grade Level	9-12
Course Name	WOL-Earth Science-A	# of Credits	0.5/1.0 Total
SCED Code	03001G0.5012	Curriculum Type	K-12 Fuel Education

COURSE DESCRIPTION

Earth Science is the branch of science devoted to studying the planet Earth and all the objects in the universe. This course begins with an introduction to the processes, methods, and tools of scientific inquiry. An understanding of the geology of Earth is built through units that discuss topics such as rocks and minerals, plate tectonics, and Earth's natural resources. Students build their understanding of the structure and function of the Earth's atmosphere, as well as situations that cause changes in the atmosphere. The study of oceanography is introduced with such topics as sea floor features and ocean currents. Weather, climate, and climate change are topics that begin to develop an understanding of meteorology. Throughout the course, students develop an understanding of how Earth's systems and cycles work together to make life on Earth possible. The students also take a tour of the universe as they discuss its formation, the characteristics of the objects in our solar system, and the universe beyond our solar system. Throughout the course, they see examples of how individuals have built our knowledge of Earth and the universe through invention, innovation, and discovery.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK_(Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
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-ESS1-6	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-ESS2-2	Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth's systems.
HS-ESS2-3	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
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.
HS-ESS2-7	Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
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-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*
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.
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.
HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/ STUDENT CENTERED GOALS
<p>Unit 1 Earth Science and Systems</p> <ul style="list-style-type: none"> • Semester Introduction • Why Study Earth Science? • Historical Contributions in Earth Science 1 • Historical Contributions in Earth Science 2 • Spheres as Earth Systems • Laboratory: Topographical Maps • Earth Systems and Interactions • Laboratory: Modeling Earth Science Processes 1 • Laboratory: Modeling Earth Science Processes 2 	<p>HS-ESS1-6 HS-ESS2-2 HS-ESS3-6</p>	<ul style="list-style-type: none"> • Students explain interactions between the systems of the earth and how these interactions produce planetary changes and analyze changes in various spheres of the earth to determine how these changes impact earth systems. Students interpret diagrams and assess erosion and deposition on the earth's surface and systems. • Students examine early ideas in Earth Science by scientists such as Hutton and Lord Kelvin. Students learn and describe the composition and changes in temperature and pressure for each layer of the earth's interior and study the geologic time scale to learn how major biologic events correspond to earth's geologic history and use the fossil record to interpret the past. Students compare the timeline of life on earth with the geologic periods of earth's history. Students learn the Big Bang Theory and how the universe may have been formed initially. • Students learn in detail about the relationships between and among Earth systems and the impact humans make on the systems, but need direction to be able to create or use a computational representation.
<p>Unit 2 Dynamic Earth</p> <ul style="list-style-type: none"> • Introduction to Plate Tectonics • Pangaea and Continental Drift • Moving Plates • Plate Boundaries 1 • Plate Boundaries 2 • Plate Tectonics: Historical Perspective • Where Earthquakes and Volcanoes Occur • Structure of Earth's Interior • Laboratory: Island Chain Formation • How Earthquakes Happen • Locating Earthquakes • Earthquakes and Waves • Laboratory: Earthquake Epicenter • How Volcanoes Form • Volcanic Zones • Mountain Building • Impact of Geologic Events 	<p>HS-ESS1-5 HS-ESS1-6 HS-ESS2-2 HS-ESS2-3</p>	<ul style="list-style-type: none"> • Students understand how the plates in the Earth move and create landforms and natural disasters and apply the theory of plate tectonics to explain the occurrence and interaction of earthquakes, volcanoes, mid-ocean ridges, and deep-sea trenches. Students learn how plate tectonics theory led scientists to understanding how the earth moves and ages. • Students examine early ideas in Earth Science by scientists such as Hutton and Lord Kelvin. Students learn and describe the composition and changes in temperature and pressure for each layer of the earth's interior and study the geologic time scale to learn how major biologic events correspond to earth's geologic history and use the fossil record to interpret the past. Students compare the timeline of life on earth with the geologic periods of earth's history. Students learn the Big Bang Theory and how the universe may have been formed initially. • Students learn the composition and pressure changes for each layer of the Earth. Students recognize that plate tectonics is the framework for understanding the features and formation of the ocean floor. Students apply data about waves to analyze the internal structure of the earth. Students learn different types of volcanoes and interpret a diagram of a composite cone volcano and explain how it formed. Students learn how to apply the theory of plate tectonics to explain

		<p>landforms including mid-ocean ridges and deep sea trenches. Students gather data to assess the impact of specific geologic events in terms of physical changes in our earth.</p> <ul style="list-style-type: none"> • Students explore the structure of the earth's interior and examine how heat plays a role in each layer. Students examine the process of forming a volcano and how the heat is transferred up through the volcano. Students look at the surface of the earth to figure out how the sun's heat and energy impacts the surface and the life on earth.
<p>Unit 3 Composition of the Earth</p> <ul style="list-style-type: none"> • Minerals on Earth • Mineral Properties • Valuable Minerals • Crystal Structures • Rocks and Their Mineral Composition • Three Kinds of Rocks • Laboratory: Rocks and Minerals 1 • Laboratory: Rocks and Minerals 2 • Rock Origins 1 • Rock Origins 2 • The Rock Cycle • Earth Materials Change • Weathering and Erosion • Land Use and Its Effects 	<p>HS-ESS2-2 HS-ESS3-1 HS-ESS3-4 HS-ESS3-6 HS-ETS1-1</p>	<ul style="list-style-type: none"> • Students explain interactions between the systems of the earth and how these interactions produce planetary changes and analyze changes in various spheres of the earth to determine how these changes impact earth systems. Students interpret diagrams and assess erosion and deposition on the earth's surface and systems. • Students examine a myriad of environmental issues and develop their own opinions and arguments about ways to deal with and solve problems. Students look at how humans are influenced by the environment and how the environment is influenced by humans. Students learn how the activities of humans have both adversely and positively impacted the environment and what the consequences of these activities are. • Students get multiple opportunities to evaluate solutions for environmental problems and look to find ways to improve the outcome by reducing the negative consequences that are sometimes • Students get multiple opportunities to evaluate solutions for environmental problems and look to find ways to improve the outcome by reducing the negative consequences that are sometimes • Students learn in detail about the relationships between and among Earth systems and the impact humans make on the systems, but need direction to be able to create or use a computational representation. • Students examine global crises and look for solutions to issues including the way land is used and/or developed and specific environmental issues on our planet.
<p>Unit 4 Geological History</p> <ul style="list-style-type: none"> • Earth's History • Earth's History and Change • The Fossil Record • Age of Geologic Features • Earth's History Written in Rocks • Laboratory: Interpreting Geologic History, Day 1 	<p>HS-ESS1-6</p>	<ul style="list-style-type: none"> • Students examine early ideas in Earth Science by scientists such as Hutton and Lord Kelvin. Students learn and describe the composition and changes in temperature and pressure for each layer of the earth's interior and study the geologic time scale to learn how major biologic events correspond to earth's geologic history and use the fossil record to interpret the past. Students compare the timeline of life on earth with the geologic periods of earth's

<ul style="list-style-type: none"> Laboratory: Interpreting Geologic History, Day 2 		<p>history. Students learn the Big Bang Theory and how the universe may have been formed initially.</p>
<p>Unit 5 Earth's Atmosphere</p> <ul style="list-style-type: none"> Layers in the Atmosphere Composition of the Atmosphere History of the Earth's Atmosphere Laboratory: Barometer 1 Laboratory: Barometer 2 The Sun and Energy Solar Radiation Temperature and Air Pressure Air Circulation Patterns 1 Air Circulation Patterns 2 Air Movement and Weather Wind and Human Activity Laboratory: Energy Absorption/Reflection 1 Laboratory: Energy Absorption/Reflection 2 	<p>HS-ESS2-3 HS-ESS2-4 HS-ESS2-7 HS-ESS3-1</p>	<ul style="list-style-type: none"> Students explore the structure of the earth's interior and examine how heat plays a role in each layer. Students examine the process of forming a volcano and how the heat is transferred up through the volcano. Students look at the surface of the earth to figure out how the sun's heat and energy impacts the surface and the life on earth. Students learn the evolution of the earth's atmosphere and life based on the carbon cycle and how it impacts living organisms. Students work to develop their own understanding of the evolution of the sphere's in our earth. Students understand how there would be no life on earth without the earth's systems. Students delve into the flow of energy from the sun through the atmosphere and how that flow creates weather. Students examine climate and weather and explore how energy is transferred by the different types of weather and how this impacts climates. Students examine a myriad of environmental issues and develop their own opinions and arguments about ways to deal with and solve problems. Students look at how humans are influenced by the environment and how the environment is influenced by humans. Students learn how the activities of humans have both adversely and positively impacted the environment and what the consequences of these activities are.
<p>Unit 6 Weather 1</p> <ul style="list-style-type: none"> Gathering Weather Data Weather Maps Laboratory: Weather Map Interpretation 1 Laboratory: Weather Map Interpretation 2 Cloud Formation How Storms Develop Determining Level of Risk Preparing for Severe Weather 	<p>HS-ESS3-5</p>	<ul style="list-style-type: none"> Students describe and understand tools used to gather weather data and learn that climate and weather are the result of the uneven distribution of solar energy over the earth's surface. Students are able to define climate as the average atmospheric conditions of a region as described over time by weather observations. Students understand the impact of the gases creating different weather and climate changes and patterns, and work to predict the weather. Students understand how weather and climate impact the systems of the earth
<p>Unit 7 Semester Review and Test</p> <ul style="list-style-type: none"> Semester Review Semester Test 		