GEOLOGY CURRICULUM

Course 18090

Students in Geology will learn the terms, ideas, processes, and principles of the study of our Earth. They will learn to use scientific thinking, processes and tools to study geology. Topics to be covered include: Earth's composition, minerals, rocks, energy resources, geologic history, plate tectonics, earthquakes, volcanos erosion, glaciers, and oceans.

GEOLOGY OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
• Understand Earth's structure and composition. • Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. • Explain the processes that take place at plate boundaries and how these processes continue to shape Earth. • Analyze features caused by the interaction of processes that change Earth's surface. • Explain the impact of obtaining and using natural resources for the production of energy and materials. • Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter.	• Evaluate experimental information for relevance and adherence to science processes. • Compare the accuracy of predictions represented in a model to actual observations and behavior. • Describe advantages and disadvantages of using models to simulate processes and outcomes. • Describe how relationships represented in models are used to explain scientific or technological concepts.	Chapter Tests	1/2-year	Holt McDougal Earth Science

GEOLOGY MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Chapter 1 Introduction to Earth Science (1.5 week)	• Earth scientists help us understand our place in Earth's history and in the universe. They can also help us gain access to Earth's resources and use these resources wisely.	1. The Scientific study of Earth 2. Branches of Earth Science 3. The importance of Earth Science 4. Behavior of Natural Systems 5. Scientific Methods 6. Scientific measurements and analysis 7. Acceptance of scientific ideas 8. Science and society.	• What is Earth science? • What are the main branches of Earth science? • What are the scientific methods?	3.1.P.A9 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements. Examine the status of existing theories. Evaluate experimental information for relevance and adherence to science processes. Judge that conclusions are consistent and logical with experimental conditions. Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. Communicate and defend a scientific argument.	• Describe two cultures that contributed to modern scientific study. • Name the four main branches of Earth science. • Discuss how Earth scientists help us understand the world around us. • Explain how science is different from other forms of human endeavor. • Analyze how scientific thought changes as new information is collected. • Identify the steps that make up scientific methods. • Explain how science affects society.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects
Chapter 2 Earth as a System (2 weeks)	• Understanding Earth's structure and composition helps us not only study other bodies in the universe, but also appreciate the features that make our own planet unique.	1. Earth basics 2. Earth's interior 3. Earth as a magnet 4. Earth's gravity 5. Earth's four spheres 6. Earth's energy budget	• What is the structural features of Earth and how do they affect life? • How can Earth be considered a system?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks.	• Describe the size and shape of Earth. • Describe the compositional and structural layers of Earth's interior. • Identify the possible	Students will be given the following: Preferential seating when applicable Study guides	Daily assessments End of chapter exams Labs and projects

	• Viewing Earth as a system helps scientists study ways that matter and energy interact to create and support Earth's life forms and living conditions. • The study of ecology demonstrates, and helps us appreciate, the interconnectedness of all the Earth systems that support and sustain humans and all other living things.	7. Cycles in the Earth system 8. Ecosystems 9. Balancing forces in ecosystems 10. Energy transfer 11. Human stewardship of the environment.	• What is the main sources of energy in Earth's system? • What is an ecosystem and what are factors that control the balance of an ecosystem?	Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains	source of Earth's magnetic field. • Compare an open system with a closed system. • List the characteristics of Earth's four major spheres. • Identify the two main sources of energy in the Earth system. • Identify four processes in which matter and energy cycle on Earth. • Define ecosystem. • Identify three factors that control the balance of an ecosystem. • Summarize how energy is transferred through the ecosystem. • Describe one way that ecosystems respond to environmental change.	Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	

				and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 3 Models of the Earth (1.75 weeks)	• Using past and present technologies, scientists can create extremely accurate models of Earth's surface. • Latitude and longitude form a frame of reference that is based on Earth's axis of rotation, making it possible to identify and locate any point on Earth. • Maps are models of Earth's surface that can be made or chosen to display characteristics for a specific purpose. • Different types of maps enable scientists to display detailed three - dimensional information about the surface and below the surface of Earth.	1. Latitude and longitude 2. Great circles 3. Finding direction 4. Technology used in making maps 5. Map projections 6. Reading a map 7. Topographic maps 8. Geologic maps 9. Soil maps.	• How can latitude and longitude be used to find specific locations on Earth? • Why are great circle routes commonly used in navigation? • Why are all maps inaccurate in some way?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica,	• Distinguish between latitude and longitude. • Explain how latitude and longitude can be used to locate places on Earth's surface. • Explain how a magnetic compass can be used to find directions on Earth's surface. • Explain two ways that scientists get data to make maps. • Describe the characteristics and uses of three types of maps. • Summarize how to use keys, legends, and scales to read maps. • Explain how elevation and topography are shown on a map. • Describe three types of information	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	shown in geologic maps. • Identify two uses of soil maps.		
Chapter 4 Earth Chemistry (1.25 week)	• To understand the world around you, it helps to understand what Earth is made of. • Most of the matter in the universe consists of a collection of electrons and ions, called plasma.	1. Properties of matter 2. Atomic structure 3. Atomic number 4. Atomic mass 5. The periodic table of elements 6. Valence electrons and the periodic table 7. Chemical formulas 8. Chemical equations 9. Chemical bonds 10. Mixture.	• What are the physical properties versus the chemical properties of matter? • What is the basic structure of an atom? • How do isotopes of an element differ from each other? • Why do atoms join to form molecules? • What is difference	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2	• Compare chemical properties and physical properties of matter. • Describe the basic structure of an atom. • Compare atomic number, mass number, and atomic mass. • Define isotope. • Describe the arrangement of elements in the periodic table. • Define compound and molecule	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

			between ionic and covalent bonds?	Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	• Interpret chemical formulas. • Describe two ways that electrons form chemical bonds between atoms. • Explain the differences between compounds and mixtures.		
Chapter 5 Minerals of Earth's Crust	• Understanding the properties of minerals	1. Characteristics of minerals	• What are the	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface.	• Define a mineral.	Students will be given the following:	Daily assessments

(1.75 weeks)	is important for being able to identify and use them. • Minerals are used to make millions of products used daily by humans.	2. Kinds of minerals 3. Crystalline structure 4. Physical properties of minerals 5. Special properties of mineral.	characteristics that are necessary to classify a substance as a mineral? • What are the properties that help distinguish one mineral from another?	Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3	• Compare the two main groups of minerals. • Identify the six types of silicate crystalline structures. • Describe three common non-silicate crystalline structures. • Describe seven physical properties that help to distinguish one mineral from another. • List five special properties that may help to identify certain minerals.	Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	End of chapter exams Labs and projects

				Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). 11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 6 Rocks (1.75 weeks)	• The hundreds of different types of rocks on Earth can be classified into three main types: igneous, sedimentary, and metamorphic. • The three main rock types are constantly changing from one type to another in a process called the rock cycle.	1. Three major types of rocks 2. The rock cycle 3. Properties of rocks 4. The formation of magma 5. Textures of igneous rocks 6. Composition of igneous rock 7. Intrusive igneous rock 8. Extrusive igneous rock 9. Formation of sedimentary rocks 10. Chemical sedimentary rocks 11. Clastic sedimentary rocks 12. Organic sedimentary rocks 13. Sedimentary rock features 14. Formation of metamorphic rocks 15. Classification of metamorphic rocks.	• What are the three main types of rocks? • How does each major rock type form? • What are the steps of the rock cycle?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1	• Identify the three major types of rock, and explain how each type forms. • Summarize the steps in the rock cycle. • Explain Bowen's reaction series. • Summarize the factors that affect the stability of rocks. • Summarize three factors that affect whether rock melts. • Describe how the cooling rate of magma and lava affects the texture of igneous rocks. • Classify igneous rocks according to their composition and texture.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	• Explain the processes of compaction and cementation. • Describe how chemical and organic sedimentary rocks form. • Describe how clastic sedimentary rocks form. • Identify seven sedimentary rock features. • Describe the process of metamorphism. • Explain the difference between regional and contact metamorphism. • Distinguish between foliated and non-foliated metamorphic rocks, and give an example of each.		
Chapter 7 Resources and Energy (2 weeks)	• Minerals are sources of many types of useful materials. People use various mining techniques to obtain minerals. • Nonrenewable resources are limited in supply. • Sources of renewable energy can be replaced quickly. Using renewable energy sources reduces pollution	1. Uses of mineral resources 2. Mineral exploration and mining 3. Fossil fuels 4. Fossil fuel supplies 5. Nuclear energy 6. Geothermal energy 7. Solar energy 8. Energy from moving water	• What are the four main types of mining? • What are fossil fuels? • What are the advantages and disadvantages of using fossil fuels?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter.	• Explain what ores are and where they form. • Identify why mineral resources are important. • Describe four methods by which humans obtain mineral resources.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed	Daily assessments End of chapter exams Labs and projects

	caused by the burning of fossil fuels. • The supply of fossil fuels is limited. Wise use of natural resources decreases waste and helps protect the environment.	9. Energy from biomass 10. Energy from wind 11. Environmental impacts of mining 12. Fossil fuels and the environment 13. Conservation.	• What is nuclear power? • What are the advantages and disadvantages of using nuclear power? • What is renewable energy? • What are the advantages and disadvantages of utilizing renewable energy? • What are environmental impacts associated with mining?	S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the	• Explain why coal is a fossil fuel. • Describe the formation of petroleum and natural gas. • Describe how fossil fuels are used today. • Explain how nuclear fission generates electricity. • Explain how geothermal energy may be used as a substitute for fossil fuels. • Describe two methods for harnessing energy from the sun. • Describe four sources of renewable alternative energy. • Describe the importance of using fossil fuels wisely. • Explain how the environmental impacts of mining can be reduced. • Identify how conservation protects natural resources.	Separate testing environment when applicable.	

				production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 8 The Rock Record (1.75 weeks)	• By determining the relative ages of rock layers and structures, we can better understand the processes that shape the world around us. • The absolute age of a rock can be determined by using radioactive elements. This information helps us understand how our planet formed and continues to change. • Fossils give information about the ages of rocks. They also give information about changes in life forms and the environment throughout time.	1. Uniformitarianism 2. Relative age 3. Law of superposition 4. Principle of original horizontality 5. Unconformities 6. Absolute dating methods 7. Radiometric dating 8. Carbon dating 9. Interpreting the fossil record 10. Fossilization 11. Types of fossils 12. Index fossils 13. Index fossils and absolute age.	• What is the importance in determine the relative ages of rocks? • How is the law of superposition used to determine the relative age of sedimentary rock? • What is the difference between relative and absolute age? • How do geologists use fossils to date sedimentary rock layers?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth	• State the principle of uniformitarianism. • Explain how the law of superposition can be used to determine the relative ages of rocks. • Compare three types of unconformities. • Apply the law of crosscutting relationships to determine the relative ages of rocks. • Summarize the limitations of using the rates of erosion and deposition to determine the absolute age of rock formations. • Explain how the process of radioactive decay can be used to determine the absolute ages of rocks. • Describe four ways in which entire organisms can be preserved as fossils. • List five examples of fossilized traces of organisms.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				(e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	• Describe how index fossils can be used to determine the age of rocks.		
Chapter 9 A View of Earth's Past (1.5 week)	• The geologic time scale provides a framework for understanding the geologic processes that shape our planet. • The rock and fossil records show the Earth has changed over time. • The movement of tectonic plates and the evolution and extinction of organisms have shaped the world we live in today. Our world continues to change as these processes continue.	1. The Geologic Column 2. Divisions of Geologic Time 3. Evolution 4. Precambrian Time 5. The Paleozoic Era 6. The Mesozoic Era 7. The Cenozoic Era.	• What are the major divisions of geologic time? • What are the major geologic and biological developments during each of the Eras?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological	• Summarize how scientists worked together to develop the geologic column. • List the major divisions of geologic time. • Summarize how evolution is related to geologic change. • Identify two characteristics of Precambrian rock. • Identify one major geologic and two major biological developments during the Paleozoic Era. • List the periods of the	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	Mesozoic and Cenozoic Eras. • Identify two major geologic and biological developments during the Mesozoic Era. • Identify two major geologic and biological developments during the Cenozoic Era.		
Chapter 10 Plate Tectonics (1.75 weeks)	• Earth's crust is broken into tectonic plates that are constantly moving and reshaping Earth's surface. • Evidence for continental drift was found in Earth's natural magnetism.	1. Wegener's Hypothesis 2. Sea-floor Spreading 3. Paleomagnetism 4. Wegener Redeemed 5. How Continents Move	• How do continents move? • What causes the motion of plates in the Earth's crust?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter.	• Summarize Wegener's hypothesis of continental drift. • Describe the process of sea-floor spreading. • Identify how paleomagnetis	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and projects

	• Movements of Earth's tectonic plates have had an effect on climates both past and present.	6. Tectonic Plates 7. Types of Plate Boundaries 8. Causes of Plate Motion 9. Reshaping Earth's crust 10. Effects of Continental Change 11. The Supercontinent Cycle.	• What are the effects of plate motion?	Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and	m provides support for the idea of sea-floor spreading. • Explain how sea-floor spreading provides a mechanism for continental drift. • Summarize the theory of plate tectonics. • Identify the theory of plate tectonics. • List and describe three causes of plate movement. • Identify how movements of tectonic plates change Earth's surface. • Summarize how movements of tectonics plates have influenced climates and life on Earth. • Describe the supercontinent cycle.	Extended time for assignment when needed Separate testing environment when applicable.	

				deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 11 Deformation of the Crust (1.5 weeks)	• Understanding how rock deforms by bending or breaking helps us understand the processes that shape Earth's surface. • Both folding and faulting can create tall mountains and deep valleys. • Scientists measure the rate at which Earth's surface is moving and deforming.	1. Isostasy 2. Strain 3. Stress 4. Folds 5. Faults 6. Mountain ranges and systems 7. Plate tectonics and mountains 8. Types of mountains.	• What are the causes and consequences of rock deforming? • What are the types of plate collisions that create mountains? • What are the four main types of mountains?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica,	• Summarize the principle of isostasy. • Identify the three main types of stress. • Compare folds and faults. • Identify the types of plate collisions that form mountains. • Identify four types of mountains. • Compare how folded and fault-block mountains form.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 12 Earthquakes (1.75 weeks)	• Understanding earthquakes helps people limit the destruction and loss of life that earthquakes can cause. It also helps scientists understand Earth's interior. • Determining an earthquake's location and intensity allows aid to be sent quickly after a significant earthquake occurs. • Knowing where powerful earthquakes are likely to occur and preparing for them in advance can save many lives	1. Why earthquakes happen 2. Seismic waves and Earth's interior 3. Earthquakes and plate tectonics 4. Fault zones 5. Recording earthquakes 6. Locating an Earthquake 7. Earthquake measurement 8. Tsunamis 9. Destruction to buildings and property 10. Earthquake safety	• How and where earthquakes happen? • How do scientists study earthquakes? • What is the importance of studying earthquakes	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2	• Describe elastic rebound. • Compare body waves and surface waves. • Explain how the structure of Earth's interior affects seismic waves. • Explain why earthquakes generally occur at plate boundaries. • Describe the instrument used to measure and record earthquakes.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

		11. Earthquake warning and forecasts.		Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	• Summarize the method scientists use to locate an epicenter. • Describe the scales used to measure the magnitude and intensity of earthquakes. • Describe the relationship between earthquakes and tsunamis. • Describe two possible effects of a major earthquake on buildings. • List three safety techniques to prevent injury caused by earthquake activity. • Identify four methods scientists use to forecast earthquake risks.		

Chapter 13 Volcanoes (1.75 weeks)	• Volcanoes are a window into Earth's processes. • Understanding factors that lead to a quiet or explosive volcanic eruption lets scientists learn the hazards associated with a particular volcano.	1. Formation of magma 2. Volcanism 3. Major volcanic zones 4. Intrusive activity 5. Types of eruptions 6. Types of pyroclastic material 7. Types of volcanoes 8. Calderas 9. Predicting volcanic eruption.	• What are the conditions needed for magma to form? • Where and why do volcanoes form? • What are the characteristics and types of eruptions? • What type of events may signal a volcanic eruption?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges,	• Describe the three conditions under which magma can form. • Explain what volcanism is. • Identify three tectonic settings where volcanoes form. • Describe how magma can form plutons. • Explain how the composition of magma affects volcanic eruptions. • Describe the five major types of pyroclastic material. • Identify the three main types of volcanic cones. • Describe how a caldera forms. • List three events that may signal a volcanic eruption.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).			
Chapter 14 Weathering and Erosion (2 weeks)	• Rocks change over time through processes of weathering. • Learning about the different factors that affect weathering can help you understand how human activities may impact the environment. • Earth scientists study the characteristics of soil to gain a better understanding of how to conserve and use this critical natural resource. • By understanding the factors involved in erosion, destructive events such as landslides could be avoided.	1. mechanical weathering 2. chemical weathering 3. differential weathering 4. rock composition 5. climate 6. topography and elevation 7. human activities 8. plant and animal activities 9. soil characteristics 10. soil profile 11. soil and climate 12. soil and topography 13. soil erosion 14. soil conservation 15. gravity and erosion 16. erosion and landforms	• What are the various processes of weathering? • What affects the rate of weathering? • How do soils form? • What are the factors that affect erosion?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter. Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects	• Identify three agents of mechanical weathering. • Compare mechanical and chemical weathering processes. • Describe four chemical reactions that decompose rock. • Explain how rock composition affects the rate of weathering. • Discuss how surface area affects the rate at which rock weathers. • Describe the effects of climate and topography on the rate of weathering.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).	• Summarize how soils form. • Explain how the composition of parent rock affects soil composition. • Describe the characteristic layers of mature residual soils. • Predict the type of soil that will form in arctic and tropical climates		
Chapter 15 River Systems (1.75 weeks)	• The water cycle involves the processes of evapotranspiration, condensation, and precipitation. • A region's water budget is affected by temperature, vegetation, wind, and the amount of rainfall.	1. Movements of water on earth 2. Water budget 3. Parts of a river system 4. Channel erosion 5. Development of river channels 6. Deltas and alluvial fans	• What are the processes of the water cycle? • What is the importance in water conservation?	3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface. Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Relate geochemical cycles to the conservation of matter.	• Outline the stages of the water cycle. • Describe factors that affect a water budget. • List two approaches to water conservation.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and projects

	• Water can be conserved by individuals limiting water use and by governments enforcing conservation laws and antipollution laws. • A river develops over time, through the processes of precipitation and erosion. • A river system consists of a main stream and tributaries. • The erosive ability of a river is affected by stream load, stream discharge, and stream gradient. • Erosive factors, such as gradient and discharge, can affect the development of a river channel, forming meanders and braided streams. • Two types of stream deposition are deltas, which form in water, and alluvial fans, which form on land. • Living in a floodplain has advantages and disadvantages. • Three methods of flood control include forest and soil conservation, dams, and levees. • Over time, a lake may lose its water or fill with sediment and become dry.	7. Floodplains 8. Human impacts on flooding 9. Flood control 10. The life cycle of lake.	• What changes can a river undergo over time?	Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter. 3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior. S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation. S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes,	• Summarize how a river develops. • Describe the parts of a river system. • Explain factors that affect the erosive ability of a river. • Describe how erosive factors affect the development of a river channel. • Explain the two types of stream deposition. • Describe one advantage and one disadvantage of living in a floodplain. • Identify three methods of flood control. • Describe the life cycle of a lake.	Extended time for assignment when needed Separate testing environment when applicable.	

				mountain building, mid-ocean ridges, deep-sea trenches, new land being formed). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas). S11.D.1.2.1 Evaluate factors affecting availability, location, extraction, and use of natural resources. S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation). S11.D.2.1.1 Describe how changes in concentration of minor components (e.g., O2, CO2, dust, pollution) in Earth's atmosphere may be linked to climate change. S11.D.2.1.2 Compare the transmission, reflection, absorption, and radiation of solar energy to and by Earth's surface under different environmental conditions (e.g., major volcanic eruptions, greenhouse effect, reduction of ozone layer, increased global cloud cover). S11.D.2.1.3 Explain weather patterns and seasonal changes using the concepts of heat and density. S11.D.2.1.4 Analyze weather maps and weather data (e.g., air masses, fronts, temperature, air pressure, wind speed,		

				wind direction, precipitation) to predict regional or global weather events.			
Chapter 16 Groundwater (1.5 week)	• The porosity and permeability of an aquifer affect the flow of groundwater. • The water table is the upper surface of the zone of saturation, beneath the land surface and the zone of aeration. • A well is a hole dug to below the water table, while a spring is a natural flow of groundwater to Earth's surface. • Hot springs and geysers are two land features formed by hot groundwater. • Water combines with carbon dioxide to form carbonic acid, which breaks down and dissolves minerals in rock that the water passes through. • Caverns and sinkholes form as limestone or other rock is slowly dissolved by chemical weathering. • Features of karst topography include caverns, sinkholes, and underground drainage.	1. Properties of aquifers 2. Zones of aquifers 3. Movement of groundwater 4. Topography and the water table 5. Conserving groundwater 6. Wells and springs 7. Geysers 8. Results of weathering by groundwater 9. Karst topography.	• What is the water table's relationship to land features? • What are the different forms of ground water? • What are the features of karst topography ?	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).	• Identify properties of aquifers that affect the flow of groundwater. • Describe the water table and its relationship to the land surface. • Compare wells, springs, and artesian formations. • Describe two land features formed by hot groundwater. • Describe how water chemically weathers rock. • Explain how caverns and sinkholes form. • Identify two features of karst topography.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects
Chapter 17 Glaciers (2 weeks)	• Understanding how glaciers form and move can help us make predictions about the climate. • The formation and movement of glaciers are responsible for many of our nation's natural wonders.	1. Formation of glaciers 2. Types of glaciers 3. Movement of glaciers 4. Features of glaciers 5. Glacial erosion 6. Glacial deposition	• What are the characteristics of a glacier? • How do glaciers affect landscape feature?	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment.	• Describe how glaciers form. • Compare two main kinds of glaciers. • Explain two processes by which glaciers move.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and projects

	• It is only a matter of time until another ice age is experienced.	7. Glacial lakes 8. Glacial and interglacial periods 9. Causes of glaciation.		3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).	• Describe three features of glaciers. • Describe the landscape features that are produced by glacial erosion. • Name and describe five features formed by glacial deposition. • Explain how glacial lakes form.	Extended time for assignment when needed Separate testing environment when applicable.	
Chapter 18 Erosion by wind and waves (1.5 weeks)	• Saltation and deflation are two ways that wind erodes land. • The two types of wind deposits are dunes and loess. • Wave erosion produces many shoreline features including sea cliffs, sea caves, sea arches, sea stacks, terraces, and beaches. • Beaches form from the deposition of sediments by waves. • Coastlines migrate as sea level changes. • Barrier islands are long, narrow offshore ridges of sand. • Human activities, including development and pollution, threaten coastal resources and habitat.	1. Ways wind moves sand and dust 2. Effects of wind erosion 3. Wind deposition 4. Loess 5. Shoreline erosion 6. Beaches 7. Longshore-current deposits 8. Absolute sea-level changes 9. Relative sea-level changes 10. Preserving the coastline.	• What are the effects of erosion to the coastline? • How do beaches form? • How are coastlines affected by changes in sea level? • What role does human activity play in changes in coastal land?	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains	• Describe two ways that wind erodes land. • Compare the two types of wind deposits. • Compare the formation of six features produced by wave erosion. • Explain how beaches form. • Describe the features produced by the movement of sand along a shore. • Explain how changes in sea level affect coastlines. • Describe the features of a barrier island. • Analyze the effect of human	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects

				and valleys to form; flowing water and deposition of material help form deltas).	activity on coastal land		
Chapter 20 The Ocean Basins (2.25 weeks)	• The global ocean can be divided into five major oceans and many smaller seas. • Oceanography is the study of the oceans and the seas. • Sonar is a system that uses acoustic signals and echo returns to determine the location of objects or to communicate. • Ocean floor sediments form from inorganic and biogenic materials as well as from chemical deposits. • Based on physical characteristics, deep ocean-floor sediments are classified as mud or as ooze	1. Divisions of the global ocean 2. Exploration of the ocean 3. Continental margins 4. Deep-ocean basins 5. Sources of deep ocean-basin sediment 6. Physical classification of sediment.	• How is the global ocean divided? • What are the ways and instruments used by oceanographers to study the ocean? • What are the features and characteristics of the ocean floor?	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).	• Name the major divisions of the global ocean. • Describe how oceanographers study the ocean. • Explain how sonar works. • Describe the main features of the continental margins. • Describe the main features of the deep-ocean basin. • Describe the formation of ocean-floor sediments. • Explain how ocean-floor sediments are classified by their physical composition.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and projects
Chapter 21 Ocean Water (1.75 weeks)	• Dissolved solids make up 3.5% of the mass of ocean water. Ocean water also contains dissolved gases, such as oxygen, carbon dioxide, and nitrogen. • Salinity is a measure of the amount of dissolved salts in ocean water. The temperature of ocean water is dependent on depth and latitude.	1. Dissolved gases 2. Dissolved solids 3. Salinity of ocean water 4. Factors that change salinity 5. Temperature of ocean water 6. Density of ocean water 7. Color of ocean water	• What is the composition and characteristics of ocean water? • How do marine organisms affect ocean water? • What are the major	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle.	• Describe the chemical composition of ocean water. • Describe the salinity, temperature, density, and color of ocean water. • Explain how marine organisms alter the chemistry of ocean water.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for	Daily assessments End of chapter exams Labs and projects

	The density of ocean water is dependent on temperature and salinity. The color of ocean water is affected by the presence of phytoplankton. • Marine organisms help to maintain the chemical balance of ocean water by using nutrients for life processes, and by returning the nutrients to the water after death. • There are two major zones of life in the ocean: benthic and pelagic. • The ocean is a valuable as a source of fresh water, minerals, and food. • Ocean-water pollution threatens both marine organisms and humans by damaging food resources in the ocean.	8. Ocean chemistry and marine life 9. Ocean environments 10. Fresh water from the ocean 11. Mineral and energy resources 12. Food from the ocean 13. Ocean-water pollution.	zones of ocean life?	S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).	• Explain why plankton can be called the foundation of life in the ocean. • Describe the major zones of life in the ocean. • Describe three important resources of the ocean. • Explain the threat that water pollution poses to marine organisms.	assignment when needed Separate testing environment when applicable.	
Chapter 22 Movements of the Ocean (1.5 weeks)	• As wind blows, it moves surface water in the ocean in the same direction. The Coriolis Effect causes surface currents surface currents to curve as they flow. • Surface currents are wind-driven currents. • Deep currents are produced as dense water near the North and South Poles sinks and moves toward the equator beneath less dense water. • Wind is the primary source of wave energy. Wave size is	1. Factors that affect surface currents 2. Major surface currents 3. Deep currents 4. Wave energy 5. Waves and the coastline 6. The causes of tides 7. Behaviors of tides 8. Tidal variation 9. Tidal currents	• What are the factors that affect the currents of the ocean? • What role does density play in the flow of deep currents? • What impacts do waves have on the coastline? • What is the cause and	3.3.10.A5 Explain how there is only one ocean. Explain the processes of the hydrologic cycle. Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment. 3.3.12.A5 Explain how the ocean dominates the Earth's carbon cycle. S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of objects	• Describe how wind patterns, the rotation of Earth, and continental barriers affect surface currents in the ocean. • Identify the major factor that determines the direction in which a surface current circulates. • Explain how differences in the density of ocean water	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment	Daily assessments End of chapter exams Labs and projects

	determined by wind speed, by the length of time that wind blows, and fetch. • As a wave comes in contact with the ocean floor, the wave may undergo refraction or form breakers. Waves near the shoreline can cause currents, such as an undertow and a rip current. • Tsunamis, which are caused by earthquakes on the ocean floor, volcanic eruptions, and underwater landslides, are giant, destructive waves. • The gravitational pull of the moon is the strongest on the side of Earth that is nearer the moon. As a result, the ocean on this side bulges slightly, which causes a high tide within the area of the bulge. At the same time, a smaller tidal bulge forms on the opposite side of Earth. • Tidal ranges are greatest during spring tides and smallest during neap tides. • Tidal currents are generally small in the open ocean but may create rapid currents in narrow bays along the coastline		types of tides?	within the solar system, life spans, size of atomic particles, topographic maps). S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).	affect the flow of deep currents. • Describe the formation of waves and the factors that affect wave size. • Explain how waves interact with coastline. • Identify the cause of destructive ocean waves. • Describe how the gravitational pull of the moon causes tides. • Compare spring tides and neap tides. • Describe how tidal oscillations affect tidal patterns. • Explain how the coastline affects tidal currents.	when applicable.	