

Middle School - Earth and Space Science

(NGSS in Parentheses)

Grade	Big Idea	Essential Questions	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Assessment Anchor Eligible Content
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	The phases of the Moon are caused by the orbit of the moon around the Earth. (ESS1.A)	Identify and explain monthly patterns in the phases of the Moon.	Orbit Pattern Phase Waning Waxing	3.4.4.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.B2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	The phases of the Moon are caused by the orbit of the moon around the Earth. (ESS1.A)	Use a model of the relative positions of the sun, earth and moon to explain the phases of the moon.	Orbit Pattern Phase Waning Waxing	3.4.4.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.B2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Observable patterns and changes in tides are caused by the Earth-Moon-Sun system. (ESS1.B)	Use models of the Earth-Sun-Moon system to support explanations and predict the cyclic patterns of tides.	Gravity Neap tide Spring tide System Tide	3.4.4.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A4 3.3.6.B1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1 S8.D.3.1.2
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Observable eclipses are caused by motions in the Earth-Moon-Sun system. (ESS1.A)	Use models of the Earth-Sun-Moon system to support explanations and predict the cyclic patterns of eclipses.	Lunar Eclipse Penumbra Solar Eclipse Umbra	3.4.4.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.B2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1

Middle School - Earth and Space Science

6-8	The universe is composed of a variety of different objects which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Earth's spin axis is fixed in direction and tilted relative to its orbit around the sun. The seasons are a result of the Earth's tilt on its axis and are caused by the differential intensity of sunlight on different areas of Earth throughout the year. (ESS1.B)	Use models of Earth's orientation and motion to explain how changes in intensity and duration of daily sunlight lead to seasons.	Axis Cyclical pattern Earth Orbit Orientation Position Revolution Rotation Season Tilt	3.4.4.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.B2 3.3.6.B2 3.3.7.B2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1
6-8	The universe is composed of a variety of different objects which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Earth's spin axis is fixed in direction and tilted relative to its orbit around the sun. The seasons are a result of the Earth's tilt on its axis and are caused by the differential intensity of sunlight on different areas of Earth across the year. (ESS1.B)	Identify and explain the position and orientation of the Earth as it orbits the Sun.	Axis Cyclical pattern Earth Orbit Orientation Position Revolution Rotation Season Tilt	3.4.4.D 3.4.7.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.B2 3.3.6.B2 3.3.7.B2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1 S8.D.3.1.2
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Earth and its solar system are part of the Milky Way Galaxy, which is one of many galaxies in the universe. (ESS1.A)	Construct and use scale models to describe the relationship of Earth to the rest of the solar system, the Milky Way Galaxy, and the universe.	Galaxy Moon Satellite Solar system Universe	3.4.7.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.B1 3.3.5.B1 3.3.7.B1 3.3.7.B2 3.3.8.B1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1 S8.D.3.1.2 S8.D.3.1.3
6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Our solar system is a collection of objects, including planets, their moons, and asteroids that are held in orbit around the Sun by its gravitational pull on them. (ESS.B)	Construct and use scale models of the solar system to support the explanation of the role of gravity in the motions of the planets of the observed system.	Asteroids Gravity Moon Satellite Solar system	3.4.7.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.B1 3.3.6.B1 3.3.7.A4 3.3.7.B1 3.3.6.B2 3.3.7.B2 3.3.8.B1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1 S8.D.3.1.2

Middle School - Earth and Space Science

6-8	The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Our solar system is a collection of objects, including planets, their moons, and asteroids that are held in orbit around the Sun by its gravitational pull on them. (ESS1.B)	Analyze and interpret data to determine scale properties (i.e. distance from sun, diameter, etc.) of objects in the solar system.	Asteroids Gravity Moon Satellite Solar system	3.4.7.D 3.1.7.A 3.1.7.B 3.1.7.C 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.B1 3.3.6.B1 3.3.7.A4 3.3.7.B1 3.3.6.B2 3.3.7.B2 3.3.8.B1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.3.1.1 S8.D.3.1.3
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.(ESS2.A)	Construct and analyze models to describe systems interactions among the geosphere, hydrosphere, atmosphere, and biosphere.	Atmosphere Biosphere Geosphere Hydrosphere	3.5.7.A 3.5.7.C 3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.A4 3.3.4.A5 3.3.8.A1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2 S8.D.1.1.3 S8.D.2.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.(ESS2.A)	Classify rocks as one of three different types and explain the interrelationship of the rock types as part of the rock cycle. (e.g., igneous: granite, basalt, obsidian, pumice; sedimentary: limestone, sandstone, shale, coal; and metamorphic: slate, quartzite, marble, gneiss).	Erosion Geosphere Igneous rock Metamorphic rock Rock cycle Sedimentary rock Weathering	3.5.7.A 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.A4 3.3.4.A5 3.3.7.A1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.1
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.(ESS2.A)	Plan and carry out investigations that investigate models of the chemical and physical processes that cycle earth materials and form rocks.	Geosphere Energy flow Erosion Igneous Metamorphic Rock cycle Sedimentary Weathering	3.5.7.A 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.A4 3.3.4.A5 3.3.7.A1 3.3.8.A1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.1 S8.D.1.1.2

Middle School - Earth and Space Science

6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.(ESS2.A)	Compare and contrast various soil types and their characteristics found in different biomes (e.g, regionally, nationally, globally) and explain how they were formed.	Biome Geosphere Energy flow Erosion Rock cycle Soil horizons Weathering	3.5.7.A 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.4.A4 3.3.4.A5 3.3.6.A2 3.3.7.A2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.3
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among geosphere, hydrosphere, biosphere, and atmosphere via transpiration, evaporation, condensation, and precipitation. (ESS2.C)	Develop models for the movement of water within the Earth's spheres (i.e., geosphere, hydrosphere, biosphere, atmosphere).	Atmosphere Condensation Evaporation Hydrosphere Infiltration Precipitation Runoff Transpiration Water Cycle Water System	3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.A4 3.3.6.A4 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.3.1
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among geosphere, hydrosphere, biosphere, and atmosphere via transpiration, evaporation, condensation, and precipitation. (ESS2.C)	Compare and contrast characteristics of freshwater and saltwater systems on the basis of their physical characteristics.	Density Freshwater Hydrosphere Salinity Saltwater	3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.A4 3.3.6.A4 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.3.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among geosphere, hydrosphere, biosphere, and atmosphere via transpiration, evaporation, condensation, and precipitation. (ESS2.C)	Investigate water systems to identify seasonal and annual variations in precipitation and streamflow and the causes of those variations.	Flow rate Hydrosphere Ocean systems River systems Watershed Wetland	3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.A4 3.3.6.A4 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.3.2 S8.D.1.3.3 S8.D.1.3.4

Middle School - Earth and Space Science

6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among geosphere, hydrosphere, biosphere, and atmosphere via transpiration, evaporation, condensation, and precipitation as well as downhill flows on land. (ESS2.C)	Assess the physical characteristics of a stream to determine the types of organisms found within the stream environment.	Biological diversity Flow rate River systems Stream Tributary Watershed	3.5.7.C 3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.5.A4 3.3.6.A4 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.3.2 S8.D.1.3.3 S8.D.1.3.4
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude and local and regional geography resulting in complex patterns that are difficult to predict. (ESS2.D)	Collect data and generate evidence to show how changes in weather conditions result from the movement, interactions, and area of origin of air masses (e.g., cold, dry Canadian air mass vs. warm, moist southern air mass).	Air pressure Atmosphere Altitude Barometer Climate Density Geography Latitude Weather Weather Front	3.5.7.C 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A6 3.3.6.A6 3.3.6.A5 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.2.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude and local and regional geography resulting in complex patterns that are difficult to predict. (ESS2.D)	Construct and use models to support the explanation of how the uneven distribution of solar energy affects global patterns in atmospheric and oceanic circulation.	Air pressure Altitude Atmosphere Barometer Circulation Climate Downwelling Geography Hydrosphere Latitude Oceanic Upwelling Weather	3.5.7.C 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A6 3.3.6.A6 3.3.6.A5 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.2.1.1 S8.D.2.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of	How and why is Earth constantly changing?	Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude and local and regional geography resulting in	Analyze weather patterns using cloud types, wind directions, and barometric pressure.	Air pressure Atmosphere Barometer Cirrus Cumulus Stratus Weather	3.5.7.C 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A6 3.3.6.A6 3.3.6.A5 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3

Middle School - Earth and Space Science

	temporal and spatial scales.		complex patterns that are predicted with varying degrees of reliability. (ESS2.D)					S8.D.2.1.3
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The ocean and other large bodies of water exert a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents that are driven by differences in density relative to temperature and salinity.	Construct explanations from models of oceanic and atmospheric circulation, and for the development of local and regional climates.	Atmosphere Atmospheric circulation Climate Density Hydrosphere Oceanic circulation Salinity	3.5.7.C 3.5.7.D 3.1.7.A 3.1.7.B 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3. .3.7.A6 3.3.6.A6 3.3.6.A5 3.3.8.A4	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.2.1.1 S8.D.2.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Major events in Earth's history leave evidence in the geologic record that allow the construction of a geologic time scale based on relative ages. (ESS1.C)	Use geologic evidence to construct patterns and determine the relative ages and sequence of geologic events in Earth's 4.6 billion year history.	Geosphere Geologic time Index fossils Law of superposition Relative age Scale	3.5.7.A 3.5.7.B 3.1.7.D 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A3	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2 S8.D.1.1.4
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The Earth's systems interact on various time and size scales. These interactions have shaped Earth's history and will determine its future. (ESS2.A)	Construct an explanation based on evidence for how various processes have changed Earth's surface at varying time and spatial scales (e.g., short-term deposition vs. mountain building; short-term weathering and erosion vs. canyon or valley formation).	Erosion Geosphere Plate tectonics Sea floor spreading Subduction Weathering	3.5.7.A 3.5.7.B 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.A1 3.3.7.A1 3.3.8.A1 3.3.10.A1	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2 S8.D.1.1.4
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial	How and why is Earth constantly changing?	Plate tectonics is the unifying theory that explains the past, and current, and future movements of the rocks at Earth's surface and provides a framework for understanding its geological history. Tectonic processes continually generate new ocean seafloor	Develop and use models of past plate motions to support explanations of existing patterns in the fossil record, rock record, continental shapes and sea floor structures.	Asthenosphere Continent Continental drift Convection Fossil record Geosphere Lithosphere Mantle	3.5.7.A 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.A1 3.3.7.A6 3.3.8.A6	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2

Middle School - Earth and Space Science

	scales.		at ridges and destroy old seafloor at trenches. (ESS2.B)		Rock record Plate motion Plate tectonics Seafloor Spreading			S8.D.1.1.4
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Plate tectonics is the unifying theory that explains the past, and current, and future movements of the rocks at Earth's surface and provides a framework for understanding its geological history. Tectonic processes continually generate new ocean seafloor at ridges and destroy old seafloor at trenches. (ESS2.B)	Incorporate a variety of data including geological evidence from maps and representations of current plate motions to predict future plate motions.	Asthenosphere Continental drift Convection Geosphere Fossil record Lithosphere Mantle Plate motion Plate tectonics Rock record Seafloor Spreading	3.5.7.A 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.A1 3.3.7.A6 3.3.8.A6	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Plate tectonics is the unifying theory that explains the past, and current, and future movements of the rocks at Earth's surface and provides a framework for understanding its geological history. Tectonic processes continually generate new ocean seafloor at ridges and destroy old seafloor at trenches. (ESS2.B)	Use models to explain how the flow of energy (convection of heat) drives the cycling of matter between Earth's surface and deep interior.	Convection Convergence Crust Divergence Geosphere Inner core Mantle Outer core Plate tectonics	3.4.7.B 3.5.7.A 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.A1 3.3.7.A6 3.3.8.A6	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Some natural hazards such as volcanic eruptions and severe weather may be preceded by phenomena that allow for reliable prediction. Others such as earthquakes occur suddenly with no notice and are not yet predictable. (ESS3.B)	Investigate or develop a map of the past and present natural hazards in a region to demonstrate an understanding of forecasting the likelihood of future events and to inform designs for development of technologies to mitigate their effects.	Earthquake Floods Geosphere Hurricane Natural hazard Tornado Tsunami Volcanoes	3.5.7.A 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.8.A6 3.3.10.A1 3.3.10.A6	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.2
6-8	The Earth is a complex and dynamic set of interconnected systems	How and why is Earth constantly changing?	Evolution is shaped by Earth's varying geological and environmental conditions.	Use evidence from the rock and fossil records to construct arguments that explain how past changes in earth's	Eruption Extinction Fossil record	3.4.7.D 3.5.7.A 3.1.7.A	3.3.7.A3	S8.A.1.1 S8.A.1.2 S8.A.1.3

Middle School - Earth and Space Science

	(e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.		Sudden changes in conditions (e.g., meteor impacts, major volcanic eruptions) have caused mass extinctions, but these changes, as well as more gradual ones, have ultimately allowed other life forms to flourish. (ESS3.C)	conditions have caused major extinctions of some life forms and allowed others to flourish.	Geosphere Mass Meteor impact Volcanic	3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D		S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.1.4
6-8	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Humans depend on Earth's land, ocean, atmosphere, and living things for many different resources. (ESS3.A)	Describe a product's transformation process from production to consumption.	Atmosphere Consumption Geosphere Hydrosphere Natural resources Nonrenewable resources Ore Production Renewable resources	3.5.7.B 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.8.A2 3.3.8.A3	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.B.3.2 S8.D.1.2.1
6-8	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Minerals, fresh water, and living resources are limited, and many are not renewable or replaceable over human lifetimes. (ESS3.A)	Use maps and other data to explain how geologic processes have led to the uneven distribution of Earth's natural resources.	Atmosphere Climate Fossil record Geosphere Hydrosphere Mineral Natural Plate tectonics Resources	3.5.7.A 3.5.7.B 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.6.A1 3.3.8.A2 3.3.8.A3	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.B.3.2 S8.D.1.1.2 S8.D.1.2.1
6-8	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Minerals, fresh water, and living resources are limited, and many are not renewable or replaceable over human lifetimes. (ESS3.A)	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	Atmosphere Consumption Geosphere Hydrosphere Mineral Natural Nonrenewable resources Population growth Renewable resources	3.5.7.B 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.8.A2 3.3.8.A3 3.3.10.A2	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.B.3.3 S8.D.1.2.2

Middle School - Earth and Space Science

					Resources			
6-8	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Human activities influence Earth's global temperature, and these effects can be mitigated through applying knowledge of climate science, engineering, etc. (ESS3.D)	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	Atmosphere Biosphere Carbon dioxide (CO ₂) Climate Global warming	3.5.7.C 3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D	3.3.7.A5 3.3.8.A5 3.3.10.A6	S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.2.1.1 S8.D.2.1.2 S8.D.2.1.3
6-8	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Human activities have significantly altered the biosphere and geosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. (ESS3.D)	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	Biosphere	3.1.7.A 3.1.7.D 3.1.7.E 3.2.7.A 3.2.7.B 3.2.7.C 3.2.7.D		S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.D.1.2.2