MIDDLE SCHOOL EARTH AND SPACE SCIENCE

NGSS Standards:

ESS1: Earth's Place in the Universe

1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

1-3 Analyze and interpret data to determine scale properties of objects in the solar system.

1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history

ESS2: Earth's Systems

2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales

2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.

2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

ESS3: Earth and Human Activity

3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geosciences processes.

3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Unit	Lesson Outline	NGSS
Unit 1: Lab Skills	1-1 Lab equipment 1-2 Safety 1-3 Lab Procedures 1-4 Making Observations 1-5 Measuring 1-6 Planning an Investigation 1-7 Writing Up an Investigation	
Unit 2: Our Solar System	2-1 The Planets of Our Solar System 2-2 The Sun 2-3 Stars 2-4 Life Cycle of a Star 2-5 Constellations 2-6 Galaxies 2-7 Asteroids, Comets, and Meteors 2-8 The Big Bang 2-9 Conditions for Life 2-10 Discovering Other Planets	MS-ESS1-1 MS-ESS1-2 MS-ESS1-3
Unit 3: Planet Earth	3-1 Earth's Place in the Solar System 3-2 Earth's Rotation and Revolution 3-3 Day and Night	

	3-4	Seasons	MS-ESS1-1
	3-5	The Moon	MS-ESS1-2
	3-6	Lunar Phases	MS-ESS1-3
	3-7	Eclipses	
	3-8	Tides	MS-ESS2-4
Unit 4: Earth's History	4-1	The Formation of the Earth	
	4-2	Geological Time Scale	
	4-3	Early Life on Earth	MS-ESS1-4
	4-4	Mass Extinction	
	4-5	Climate on Prehistoric Earth	MS-ESS2-2
	4-6	Types of Fossils	MS-ESS2-3
	4-7	The Fossil Record	
	4-8	Relative and Absolute Dating	
Unit 5: Earth's Materials and Systems	5-1	The Structure of the Earth	
	5-2	The Earth's Crust	
	5-3	Plate Tectonics	MS-ESS1-3
	5-4	Convection	
	5-5	Plate Boundaries	MS-ESS2-1
	5-6	Continental Drift	MS-ESS2-2
	5-7	Volcanoes	MS-ESS2-3
	5-8	Earthquakes	
	5-9	Meteorites	MS-ESS3-3
Unit 6: Earth's Changing Surface	6-1	Chemical Weathering	
	6-2	Physical Weathering	
	6-3	Agents of Erosion	
	6-4	The Erosion Cycle	MS-ESS2-1
	6-5	Rocks vs Minerals	MS-ESS2-2
	6-6	Classifying Rocks	MS-ESS2-3
	6-7	The Rock Cycle	MS-ESS2-4
	6-8	The Carbon Cycle	
	6-9	The Nitrogen Cycle	
Unit 7: Water and Earth's Surface Processes	7-1	The Hydrosphere	MS-ESS2-1
	7-2	Fresh vs. Saltwater	MS-ESS2-2
	7-3	The Water Cycle	MS-ESS2-3
	7-4	Water Movement and Earth's Surface	MS-ESS2-4
Unit 8: Weather and Climate	8-1	The Atmosphere	
	8-2	Atmospheric Gases	
	8-3	Weather Patterns	

	8-4 Cloud Formation 8-5 Weather Hazards 8-6 Weather vs Climate 8-7 Biomes 8-8 Climate, Wind and Ocean Currents 8-9 Climate Change – Glacial and Interglacial Periods 8-10 Effects of Climate Change	MS-ESS2-4 MS-ESS2-5 MS-ESS2-6 MS-ESS3-1 MS- ESS3-3
Unit 9: Human Impact	9-1 Earth's Natural Resources 9-2 Renewable and Non-Renewable Resources 9-3 Human Activities Affecting the Earth's Surface 9-4 Resource Extraction 9-5 Quarrying, Mining and Drilling 9-6 Water Pollution 9-7 Air Pollution 9-8 Acid Rain 9-9 Soil Erosion	MS-ESS3-1 MS-ESS3-2 MS- ESS3-3 MS- ESS3-4