6th Grade Science Curriculum Map

Month	Objectives/Learning Goals	Applicable State and National Learning Standards	Assessments
August	Introduction to the lab. Lab Equipment, lab Rules and Procedures. SI units of measure, metric system Introduction.	NGSS Science and Engineering Practice: Analyzing and Interpreting Data	Worksheets, quizzes, tests
September	**Introduction to Earth's Systems.** *Lesson 1 Matter and Energy in Earth's systems*- students investigate and model components pf Earth's systems and energy sources that drive the cycling of matter in Earth's systems. *Lesson 2 Surface features in the geosphere*- Students will investigate and model landforms using various mapping systems, Students will also study the forces of energy that affect the geosphere, inlcuding how land forms are created through constructive and destructive forces. *Lesson 3 the Hydrosphere- Students will investigate places and forms in which water is found on Earth, and how the water cycles through Earth's Systems.*	NGSS Science Standards (NGSS). MS-Ess2-4, DCI ESS2.C THe roles of water in Earth's Surface Process, CCC.5 Energy and Matter: Flows,Cycles, and Conservation, SEP.2 Developing and Using Models to predict or describe a Phenomena, RST.6-8.9 Compare and contrast the information gained in experiments.	Science Labs, Projects, Models, Worksheets, Quizzes, Tests, Digital Interactivities, Virtual Labs
October	**Air Masses** Students investigate the movement of air masses of different temperatures and humidities to identify the type of fronts and the types of weather that can develop. **Predicting Weather Changes** Students learn how meteorologists use direct observations, pattern analysis, and technology to predict the weather.	PS-MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. PS-MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. PS-MS-ESS2-6 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. MS-ESS2-C-2 Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows	Science Labs, Projects, Models, Worksheets, Quizzes, tests, Digital Interactivities, Virtual Labs

		on land. (MS-ESS2-4) MS-ESS2-C-4 The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (MS-ESS2-5) MS-ESS2-C-5 Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2- 6) MS-ESS2-D-1 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, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6) MS-ESS2-A-2 All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1) MS-ESS2-D-3 The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (MS-ESS2-6) MS-ETS1-B-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. PS-MS-ETS1-4Models of all kinds are important for testing solutions. (MSETS1- 4) MS-SEP-2.e Develop and/or use a model to describe phenomena. MS-SEP-2.g	

		Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. MS-SEP-3.d Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. MS-SEP-4.g Analyze and interpret data to determine similarities and differences in findings. MS-SEP-6.d Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events. MGS-SEP-7.c Construct use, and present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. 6-8-CCC-2.b Cause and effect relationships may be used to predict phenomena in natural systems. 6-8-CCC-3.a Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. 6-8-CCC-4.b Models can be used to represent systems and their interactions.	
November	**Severe Weather and Flood** Students examine and describe damage associated with severe storms, as well as measures that can be taken to ensure safety in a storm. **Plate Tectonics**Throughout this topic, students evaluate evidence of plate motion and the continued impact of plate tectonics on Earth's surface. Students recognize the relationship between plate boundaries and the resulting changes to Earth's surface over varying time scales . **Evidence of Plate Motions Lesson 1:** Students investigate evidence that supports the hypothesis of continental drift and the existence of Pangaea. **Lesson 2: Plate Tectonics**	PS-MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. PS-MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. PS-MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient	Science Labs, Projects, Models, Worksheets, Quizes, Tests,Digital Interactivities, Virtual Labs

	and Earth's Surface Students examine how convection drives plate motion and how the movement of Earth's plates has greatly changed the locations of the continents and the size and shape of the ocean basins. Students learn the ways that plates move at plate boundaries.	precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ESS1-C-2 Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE) (secondary to MS-ESS2-3) MS-ESS2-A-1 The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2) MS-ESS2-B-1 Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3) MS-SEP-1.g Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions 6-8-CCC-1.b Patterns in rates of change and other numerical relationships can provide information about natural systems. MGS-NoS-3.c Science findings are frequently revised and/or reinterpreted based on new evidence.	
December	***Plate Tectonics*** **Lesson 3: Earthquakes and Tsunami Hazards** Students learn how tension, shearing, and compression produce faults and other features. Students then analyze these features and events at Earth's surface to determine their relationship with plate boundaries. **Lesson 4:**	PS-MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. PS-MS-ESS2-3 Analyze and interpret data on	Science Labs, Projects, Models, Worksheets, Quizzes, Tests, Digital Interactivities, Virtual Labs

	Volcanoes and Earth's Surfaces Students examine the role that volcanic activity plays in shaping Earth's surface as well as the hazards that different types of volcanoes pose. In addition, students explore the relationship between plate tectonics and volcanic eruptions and landforms.	the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. PS-MS-ESS3-1 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 geoscience processes. PS-MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. MS-ESS1-C-2 Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE) (secondary to MS-ESS2-3) MS-ESS2-A-1 The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2) MS-ESS2-B-1 Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3) MS-ESS2-C-1 Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2) MS-ESS3-B-1 Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-	

		ESS3-2) MS-SEP-3.b Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of the investigation. MS-SEP-4.d Analyze and interpret data to provide evidence for phenomena. MS-SEP-6.c Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. MS-SEP-6.d Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events. MGS-SEP-7.c Construct use, and present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. 6-8-CCC-1.b Patterns in rates of change and other numerical relationships can provide information about natural systems. 6-8-CCC-1.c Patterns can be used to identify cause and effect relationships. 6-8-CCC-1.d Graphs and charts can be used to identify patterns in data. 6-8-CCC-2.a Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. STSE-MS-1.a Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.	

January	**Climate Factors** Students investigate how factors such as latitude, altitude, land distribution, and ocean currents influence climate patterns. Climate Change and the **effects of a changing climate** Students learn about the greenhouse effect and use historical and recent data to identify trends in Earth's warming and cooling patterns. Students model how increased temperatures affect water levels, identify the effects of warmer temperatures on living organisms, and design solutions to lessen the effect of climate change.	PS-MS-ESS1-1 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. PS-MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. PS-MS-ESS2-6 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. PS-MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. PS-MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ESS2-A-1 The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2) MS-ESS2-A-2 All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1) MS-ESS2-C-4 The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures	Science Labs, Projects, Models, Worksheets, Quizzes, Tests, Digital Interactivities, Virtual Labs .

		and currents, are major determinants of local weather patterns. (MS-ESS2-5) MS-ESS3-C-1 Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3) MS-ESS3-D-1 Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)	
February	Identifying the important variable in a scientific experiment. **Scientific Inquiry:** Forming a testable question, researching information to form an appropriate hypothesis, creating an experiment, how to perform an experiment, how to collect and analyze data from an experiment, how to wrtite a conclusion to an experiment. Students will also learn how to identify and fix issues when hypothesis does not match the collected data in an experiment.	NGSS Science and Engineering Practice: Analyzing and Interpreting Data	Worksheets, quizzes, tests, and in class labs.
March	Scientific Inquiry Continued Science Fair Preparation		Written paper, Science fair board, in class lab, Science Labs, Projects, Models, Worksheets, Quizzes, Tests, Digital Interactivities, Virtual Labs

April/May	**Earth Sun and Moon System** In this topic, students explore how the sun and moon affect Earth. They will study how different objects, including the Earth, sun, and moon, move through space. Students will also see how the motion and positon of Earth, the sun, and the moon affect each other. **Lesson 1: Movement in Space** Students investigate the different objects seen in the night sky and how Earth, the sun, and other planets move through space. **Lesson 2: Earth's Movement in Space** Students investigate how Earth and the moon remain in orbit and how Earth's motion affects the amount of daylight and the seasons.	PS-MS-ESS1-1 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. PS-MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. PS-MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ESS1-A-1 Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1) MS-ESS1-B-1 The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them. (MS-ESS1- 2),(MS-ESS1-3) MS-ESS1-B-2 This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1-1) MS-ESS1-B-3 The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS-ESS1-2) MS-ETS1-A-1 The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful.	Science Labs, Projects, Models, Worksheets, Quizzes, Tests,Digital Interactivities, Virtual Labs

		Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1- 1) MS-SEP-1.b Ask questions to identify and clarify evidence of an argument. MS-SEP-2.e Develop and/or use a model to describe phenomena. MS-SEP-2.g Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. MS-SEP-3.b Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of the investigation. MS-SEP-3.d Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. MS-SEP-4.g Analyze and interpret data to determine similarities and differences in findings. MS-SEP-6.c Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. MS-SEP-6.d Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events. MGS-SEP-7.c Construct use, and present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. 6-8-CCC-2.b Cause and effect relationships may be used to predict phenomena in natural systems. 6-8-CCC-4.b Models can be	

		used to represent systems and their interactions. MGS-NoS-6.a Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	