6th Grade Science Curriculum

Earth & Space Sciences **Next Generation Science Standards (NGSS):** **MS-ESS1-1 Earth's Place in the Universe: The Universe and its Stars**				
GLE/ Description: 6-8.ESS.1.A.1, 6-8.ESS.1.A.2, 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. [Clarification Statement: Examples of models can be physical, graphical, or conceptual.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will develop and use a model to describe phenomena.	Patterns can be used to identify cause-and-effect relationships.	3	Earth's Place in the Universe (ELO #4)	STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System
Students will display patterns of the apparent motion of the Sun, moon, and stars in the sky that can be observed, described, predicted, and explained with models.	Patterns can be used to identify cause-and-effect relationships.	3	Earth's Place in the Universe (ELO #4)	OB chapter 19 & 20 NB Chapter 20 OB pgs 529-575 NB Launch Lab 735 MiniLab 738, 744 Skill Practice 733 Lab 750-751 Pgs. 727-731, 737-739, 743-747, 801 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System Moon Phases - Oreo Lab
Students will model the solar system showing how it can explain eclipses of the sun and the moon. Earth's 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 throughout the year.	Patterns can be used to identify cause-and-effect relationships.	3	Earth's Place in the Universe (ELO #4)	OB Chapter 19 & 20 NB Chapter 20 OB pgs 529-575 NB Launch Lab 735 MiniLab 738, 744 Skill Practice 733 Lab 750-751 Pgs. 727-731, 737-739, 743-747, 801 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System Eclipse - Coding activity from edvolution center Moon model for classroom - demonstrates phases of moon

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS1-2 Earth's Place in the Universe: The Universe and its Stars

GLE/ Description: 6-8.ESS.1.A.3
Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. [Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as students' school or state).] [Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will develop and use a model to describe phenomena.	Models can be used to represent systems and their interactions.	3	Earth's Place in the Universe (ELO #4)	STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System
Students will use critical thinking skills to understand that the Earth and its solar system are part of the Milky Way galaxy, which is one of the many galaxies in the universe.	Models can be used to represent systems and their interactions.	3	Earth's Place in the Universe (ELO #4)	OB Chapter 20 NB Chapter 21 OB pgs 559-575 NB MiniLab 726, 765, 772 Skill Practice 775 Lab 790-791 Pgs.43-44, 726, 761-765, 769-773, 777-781, 785-788, 825-829 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System Milky Way galaxy simulation - http://stars.chromeexperiments.com/
Students will identify that 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.	Models can be used to represent systems and their interactions.	3	Earth's Place in the Universe (ELO #4)	OB Chapter 20 NB Chapter 21 OB pgs 559-575 NB MiniLab 726, 765, 772 Skill Practice 775 Lab 790-791 Pgs.43-44, 726, 761-765, 769-773, 777-781, 785-788, 825-829 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System Solar System classroom model - hangs in classroom Gravitational pull lab- http://sciencenetlinks.com/afterschool-resources/falling-gravity/
Students will explain how the solar system appears to have formed from a disk of dust and gas, drawn together by gravity.	Models can be used to represent systems and their interactions.	3	Earth's Place in the Universe (ELO #4)	OB Chapter 20 NB Chapter 21 OB pgs 559-575 NB MiniLab 726, 765, 772 Skill Practice 775 Lab 790-791 Pgs.43-44, 726, 761-765, 769-773, 777-781, 785-788, 825-829 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS1-3 Earth's Place in the Universe: Earth and the Solar System

GLE/ Description: 6-8.ESS.1.B.1
Analyze and interpret data to determine scale properties of objects in the solar system. [Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.] [Assessment Boundary: Assessment does not include recalling facts about properties of the planets and other solar system bodies.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will analyze and interpret data to determine similarities and differences in findings.	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.	3	Earth's Place in the Universe (ELO #4)	STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System
Students will identify that 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.	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.	3	Earth's Place in the Universe (ELO #4)	OB Chapter 20 NB Chapter 21 OB pgs 559-575 NB MiniLab 765, 772 Skill Practice 775 Lab 790-791 Pgs. 707-712, 726, 761-765, 769-773, 776-781, 785-788 STEMscopes Earth and Space Storyline 1 - Characteristics of the Solar System

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS1-4 Earth's Place in the Universe: The History of Planet Earth

GLE/ Description: 6-8.ESS.1.C.1
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. [Clarification Statement: Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history. Examples of Earth's major events could range from being very recent (such as the last Ice Age or the earliest fossils of homo sapiens) to very old (such as the formation of Earth or the earliest evidence of life). Examples can include the formation of mountain chains and ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.] [Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them.]

Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will 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.	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	3	Earth's Systems (ELO #2)	
Students will justify how the geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analysis of rock strata and the fossil record provide only relative dates, not an absolute scale.	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	3	Earth's Systems (ELO #2)	OB Chapter 8-9 NB Chapter 7 & 8 OB pgs 209-264 NB Pgs. 327-333, 337-341, 363-367 Careers in Science 335 Fossils -

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Earth & Space Sciences **Next Generation Science Standards (NGSS):** **MS-ESS2-1 Earth's Systems: Earth Materials and Systems**				
GLE/ Description: 6-8.ESS.2.A.1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will develop and use a model to describe its relationship between energy from Earth's interior and the continuous construction of Earth's crust and the formation of ridges, trenches,mountains, and active volcanic chains. (MLS)	Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.	3	Earth's Systems (ELO #2)	OB Ch 8-11 NB Ch 3-4, and 7-11 NB Launch Lab 119, 133, 149 MiniLab 115, 120, 153, 238 Skill Practice 156 Pgs.50-54, 81-83, 114-115, 119-121, 126-129, 33-134, 136, 149-154, 238-239, 257, 532-533 STEMscopes Earth and Space Storyline 3 - Earth's Materials and Systems Volcano Lab - Online volcano simulation https://www.cosmeo.com/braingames/virutal_volcano/index.cfm?title=Virtual%20Volcano
Students will analyze the processes that shape Earth are the result of energy flowing and matter cycling within and between the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and the matter that cycles produce chemical and physical changes in Earth's materials and living organisms.	Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.	3	Earth's Systems (ELO #2)	OB Ch 8-11 NB Launch Lab 119, 133, 149 MiniLab 115, 120, 153, 238 Skill Practice 156 Pgs.50-54, 81-83, 114-115, 119-121, 126-129, 33-134, 136, 149-154, 238-239, 257, 532-533 STEMscopes Earth and Space Storyline 3 - Earth's Materials and Systems Earthquake boards Chemical Change - Penny lab

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS2-2 Earth's Systems: Earth Materials and Systems

GLE/ Description: 6-8.ESS.2.A.2
Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. [Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will construct an explanation that describes how geoscience processes have occurred rapidly, gradually, or over large spans of time and over small to large spatial scale. (MLS)	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	3	Earth's Systems (ELO #2)	OB Ch 10-11 NB Ch 15 and 18 NB It's Your Turn 117, 185, 267 Launch Lab 177, 179, 187, 196, 293 MiniLab 179, 198, 227, 256, 272, 375, 392 Skill Practice 194, 275 Lab 202-203 Pgs. 42, 149-154, 160-161, 176-183, 186-192, 95-200, 217-221, 235-236, 252-257, 261-265, 268-274, 276-280, 306-314, 365-366, 372-373, 375, 379-381, 383, 388-389, 391 STEMscopes Earth and Space Storyline 3 - Earth's Materials and Systems Rocks and Minerals - Rock Hound lab on rocks and minerals Soil - water bottle lab Soil - Edible dirt Types of rocks - edible earth

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Students will compare and contrast how the planets 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.	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	3	Earth's Systems (ELO #2)	OB Ch 10-11 NB Ch 15 and 18 NB It's Your Turn 117, 185, 267 Launch Lab 177, 179, 187, 196, 293 MiniLab 179, 198, 227, 256, 272, 375, 392 Skill Practice 194, 275 Lab 202-203 Pgs. 42, 149-154, 160-161, 176-183, 186-192, 95-200, 217-221, 235-236, 252-257, 261-265, 268-274, 276-280, 306-314, 365-366, 372-373, 375, 379-381, 383, 388-389, 391 STEMscopes Earth and Space Storyline 3 - Earth's Materials and Systems Pollution - Oil Spill Lab and Albatross bolus dissection
Students will make observations to analyze how water movements- both on the land and underground- cause weathering and erosion, which change and land's surface features and create underground formations.	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	3	Earth's Systems (ELO #2)	OB Ch 10-11 NB Ch 15 and 18 NB It's Your Turn 117, 185, 267 Launch Lab 177, 179, 187, 196, 293 MiniLab 179, 198, 227, 256, 272, 375, 392 Skill Practice 194, 275 Lab 202-203 Pgs. 42, 149-154, 160-161, 176-183, 186-192, 95-200, 217-221, 235-236, 252-257, 261-265, 268-274, 276-280, 306-314, 365-366, 372-373, 375, 379-381, 383, 388-389, 391 STEMscopes Earth and Space Storyline 3 - Earth's Materials and Systems Erosion - Erosion Board lab Topographic Maps

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS2-3 Earth's Systems: Plate Tectonics and Large-Scale Systems

GLE/ Description: 6-8.ESS.2.B.1
Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. [Clarification Statement: Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).] [Assessment Boundary: Paleomagnetic anomalies in oceanic and continental crust are not assessed.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will analyze and interpret data to provide evidence for phenomena.	Patterns in rates of change and other numerical relationships can provide information about natural systems.	3	Earth's Systems (ELO #2)	
Students will analyze and interpret data to provide evidence for and explain plate tectonic movement over time and at various scales.	Patterns in rates of change and other numerical relationships can provide information about natural systems.	3	Earth's Systems (ELO #2)	OB 8-11 NB Launch Lab 217 MiniLab 221, 227, 264 Lab 242-243 NB Ch 3-4, 7-11 Pgs.217-221, 224-229, 233-236, 262-263 Careers in Science 223
Students will explain why science findings are frequently revised and/or reinterpreted based on new evidence.	Patterns in rates of change and other numerical relationships can provide information about natural systems.	3	Earth's Systems (ELO #2)	OB 8-11 NB Launch Lab 217 MiniLab 221, 227, 264 Lab 242-243 NB Ch 3-4, 7-11 Pgs.217-221, 224-229, 233-236, 262-263 Careers in Science 223
Students will demonstrate how tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.	Patterns in rates of change and other numerical relationships can provide information about natural systems.	3	Earth's Systems (ELO #2)	OB 8-11 NB Launch Lab 217 MiniLab 221, 227, 264 Lab 242-243 NB Ch 3-4, 7-11 Pgs.217-221, 224-229, 233-236, 262-263 Careers in Science 223 Plate Boundary puzzle
Students will interpret 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.	Patterns in rates of change and other numerical relationships can provide information about natural systems.	3	Earth's Systems (ELO #2)	OB Ch 8-11 NB Launch Lab 217 MiniLab 221, 227, 264 Lab 242-243 NB Ch 3-4, 7-11 Pgs.217-221, 224-229, 233-236, 262-263 Careers in Science 223 Pangea Activity

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS3-1 Earth and Human Activity: Natural Resources

GLE/ Description: 6-8.ESS.3.A.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. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will construct a scientific explanation based on evidence that demonstrates how human activity and geoscience process, both past current, cause uneven distribution of Earth's resources.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Earth and Human Activity (ELO #3)	OB Ch 8-11 NB Lab 166-167 NB Ch 3-4, 7-11 Pgs. 82-83, 94-98, 160-164, 409, 527-530, 607, 625-627, 643-649, 668-672 Careers in Science 85 Ecological Footprint - http://www.footprintcalculator.org/
Students will relate personal experiences on how humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Earth and Human Activity (ELO #3)	

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Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS3-2 Earth and Human Activity: Natural Hazards

GLE/ Description: 6-8.ESS.3.B.1
Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. [Clarification Statement: Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards can be taken from interior processes (such as earthquakes and volcanic eruptions), surface processes (such as mass wasting and tsunamis), or severe weather events (such as hurricanes, tornadoes, and floods). Examples of data can include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies can be global (such as satellite systems to monitor hurricanes or forest fires) or local (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).]

Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will analyze and interpret data to determine similarities and differences in findings.	Graphs, charts, and images can be used to identify patterns in data.	3	Earth and Human Activity (ELO #3)	OB Ch 10-11 NB MiniLab 198 Lab 202-203, 316-317 NB Ch 15 and 18 Pgs. 196-198, 302, 309, 314, 464-467
Students will construct and analyze chart data mapping the history of natural hazards in a region, combines with an understanding of related geologic forces, can help forecast the locations and likelihoods of future events.	Graphs, charts, and images can be used to identify patterns in data.	3	Earth and Human Activity (ELO #3)	OB Ch 10-11 NB Ch 15 and 18 NB MiniLab 198 Lab 202-203, 316-317 NB Ch 15 and 18 Pgs. 97, 196-198, 302, 309, 314, 434-438, 464-467, 508, 510, 546-550, 589-594, 621, 643-649, 653-657, 664-66, 672, 684 Science and Society 457, 615 Careers in Science 416 Green Science 667 Oil spill lab Deforestation- Direct Instruction using visual aids such as powerpoints. - Guided note taking

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Earth & Space Sciences **Next Generation Science Standards (NGSS):** **MS-ESS3-3 Earth and Human Activity: Human Impacts on Earth's Systems**				
GLE/ Description: 6-8.ESS.3.C.2 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.* [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will apply scientific principles to design an object, tool, process or system.	Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.	3	Earth and Human Activity (ELO #3)	OB Ch 10-11 NB Ch 15 and 18 Pgs. 97, 434-438, 508, 510, 546-550, 589-594, 621, 643-649, 653-657, 664-66, 672, 684 Science and Society 457, 615 Careers in Science 416 Green Science 667
Students will classify how 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.	Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.	3	Earth and Human Activity (ELO #3)	OB Ch 10-11 NB Ch 15 and 18 Pgs. 97, 434-438, 508, 510, 546-550, 589-594, 621, 643-649, 653-657, 664-66, 672, 684 Science and Society 457, 615 Careers in Science 416 Green Science 667
Students will recognize how an increase in human populations and per-capita consumption of natural resources causes negative impacts on Earth unless the activities and technologies involved are engineered otherwise.	Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.	3	Earth and Human Activity (ELO #3)	OB Ch 10-11 NB Ch 15 and 18 Pgs. 97, 434-438, 508, 510, 546-550, 589-594, 621, 643-649, 653-657, 664-66, 672, 684 Science and Society 457, 615 Careers in Science 416 Green Science 667

Earth & Space Sciences
Next Generation Science Standards (NGSS):
MS-ESS3-4 Earth and Human Activity: Human Impacts on Earth's Systems

GLE/ Description: 6-8.ESS3.C.1
Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will construct 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.		3	Earth and Human Activity (ELO #3)	
Students will recognize how an increase in human populations and per-capita consumption of natural resources causes negative impacts on Earth unless the activities and technologies involved are engineered otherwise.	Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.	3	Earth and Human Activity (ELO #3)	NB Lab 632-633 Pgs. 97, 434-438, 510, 546-550, 589-594, 627, 630, 643-649, 653-657, 684 Green Science 667

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Earth & Space Sciences **Next Generation Science Standards (NGSS):** **MS-ESS3-5 Earth and Human Activity: Human Impacts on Earth's Systems**				
GLE/ Description: 6-8.ESS.3.D.1 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.[Clarification Statement: Examples of factors include human activities (such as fossil fuel combustion, cement production, and agricultural activity) and natural processes (such as changes in incoming solar radiation or volcanic activity). Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities. Emphasis is on the major role that human activities play in causing the rise in global temperatures.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will analyze evidence to identify factors that have caused changes in global temperatures over the past century.	Stability might be disturbed either by sudden events or gradual changes that accumulate over time.	3	Earth and Human Activity (ELO #3)	NB Launch Lab 505 MiniLab 509 Lab 512-513 Pgs. 506-510, 592-594, 612-613, 621, 627, 630
Students will rationalize how human activities, such as the release of greenhouse gasses 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 human behavior, and on applying that knowledge wisely in decisions and activities.	Stability might be disturbed either by sudden events or gradual changes that accumulate over time.	3	Earth and Human Activity (ELO #3)	NB Launch Lab 505 MiniLab 509 Lab 512-513 Pgs. 506-510, 592-594, 612-613, 621, 627, 630

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Life Science
Next Generation Science Standards (NGSS):
MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics: Interdependent Relationships in Ecosystems

GLE/ Description: 6-8.LS2.A.1
Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]

Measurable Learner Objective	Integrated Skills/ Crosscutting	DOK	Unit	Instructional Strategies/Student Activities/ Resources (5 E Model)
Students will analyze and interpret data to provide evidence for phenomena.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: Launch Lab 749 MiniLab 371, 743 Nature of Science 370-371 Pgs. 370-371, 706-709, 724-726, 743-745, 750, 753-755 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems
Students will recognize the cause and effect relationship between organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Ecosystems (ELO #1)	OB Ch 6 pgs 137-159 Online NB Teacher Text: Launch Lab 749 MiniLab 371, 743 Nature of Science 370-371 Pgs. 370-371, 706-709, 724-726, 743-745, 750, 753-755 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems
Students will summarize the cause and effect relationships that occur In any ecosystems where organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 161-191 Online NB Teacher Text: Launch Lab 749 MiniLab 371, 743 Nature of Science 370-371 Pgs. 370-371, 706-709, 724-726, 743-745, 750, 753-755 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems
Students will collect and interpret data on how growth of organisms and population increases are limited by access to resources.	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 161-191 Online NB Teacher Text: Launch Lab 749 MiniLab 371, 743 Nature of Science 370-371 Pgs. 370-371, 706-709, 724-726, 743-745, 750, 753-755 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems

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Life Science **Next Generation Science Standards (NGSS):** **MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics: Interdependent Relationships in Ecosystems**				
GLE/ Description: 6-8.LS2.A.2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will construct an explanation that includes qualitative and quantitative relationships between variables that predict phenomena.	Patterns can be used to identify cause and effect relationships.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: Pgs. 282, 284, 286-287, 762-764, 766-767 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems
Students will identify patterns in which predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in the competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environment, both living and nonliving, are shared.	Patterns can be used to identify cause and effect relationships.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 161-191 Online NB Teacher Text: Pgs. 282, 284, 286-287, 762-764, 766-767 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems

6th Grade Science Curriculum

Life Science **Next Generation Science Standards (NGSS):** **MS-LS2-3 Ecosystems: Interactions, Energy, and Dynamics: Cycles of Matter and Energy Transfer in Ecosystems**				
GLE/ Description: 6-8.LS.2.B.1 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will develop a model to describe phenomena.	The transfer of energy can be tracked as energy flows through a natural system.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: MiniLab 760 Pgs. 240, 281, 715-716, 718-719, 723-728, 760-761 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems
Students will create a model which shows how food webs demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plants or animal matter back into the soil in terrestrial environments or into the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.	The transfer of energy can be tracked as energy flows through a natural system.	3	Ecosystems (ELO #1)	OB Ch7 pgs 163-191 Online NB Teacher Text: MiniLab 760 Pgs. 240, 281, 715-716, 718-719, 723-728, 760-761 STEMscopes MS Life Storyline 4 - Interdependent Relationships in Ecosystems

6th Grade Science Curriculum

Life Science **Next Generation Science Standards (NGSS):** **MS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics: Ecosystems Dynamics, Functioning and Resilience**				
GLE/ Description: 6-8.LS.2.C.1 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomena or a solution to a problem.	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: Pgs. 797-800
Students will analyze data about how Science disciplines share common rules of obtaining and evaluating empirical evidence.	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 163-191 Online NB Teacher Text: Pgs. 797-800
Students will examine data to show how ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all of its populations.	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 163-191 Online NB Teacher Text: Pgs. 797-800

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Life Science **Next Generation Science Standards (NGSS):** **MS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics: Ecosystems Dynamics, Functioning and Resilience**				
GLE/ Description: 6-8.LS.2.C.2 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.* [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will evaluate competing design solutions based on jointly developed and agreed upon design criteria	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 Online NB Teacher Text: Pgs. 214, 240, 241, 269, 272, 273, 275, 281-283, 339, 778-783, 788-793, NOS 20-NOS 27, 4-5
Students will draw conclusions on how biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 7 pgs 163-191 Online NB Teacher Text: Pgs. 214, 240, 241, 269, 272, 273, 275, 281-283, 339, 778-783, 788-793, NOS 20-NOS 27, 4-5
Students will develop a logical argument about how Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on (e.g., water purification and recycling).	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: Pgs. 214, 240, 241, 269, 272, 273, 275, 281-283, 339, 778-783, 788-793, NOS 20-NOS 27, 4-5
Students will interpret systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.	Small changes in one part of a system might cause large changes in another part.	3	Ecosystems (ELO #1)	OB Ch 6 and 7 pgs 137-191 Online NB Teacher Text: Pgs. 214, 240, 241, 269, 272, 273, 275, 281-283, 339, 778-783, 788-793, NOS 20-NOS 27, 4-5

6th Grade Science Curriculum

Engineering, Technology, and Applications of Science **Next Generation Science Standards (NGSS):** **MS-ETS1-1 Engineering Design: Defining and Delimiting Engineering Problems**				
GLE/ Description: 6-8.ETS.1.A.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.				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources** **(5 E Model)**
Students will define a design problem that can be solved through the development of an object, tool, process, or systems. Takes into account the needs and limitations that arise based on relevant scientific principles and potential impacts on people and the environment.	All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.	3	Engineering Design (ELO #5)	NB MiniLab 227 (Life) Lab 838-839 (Life) Humdinger Project
Students will design a task with precise criteria and well defined constraints.	All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.	3	Engineering Design (ELO #5)	NB MiniLab 227 (Life) Lab 838-839 (Life) Humdinger Project

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Engineering, Technology, and Applications of Science **Next Generation Science Standards (NGSS):** **MS-ETS1-2 Engineering Design: Developing Possible Solutions**				
GLE/ Description: 6-8.ETS.1.B.1 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will evaluate competing design solutions based on jointly developed and agreed-upon design criteria.		3	Engineering Design (ELO #5)	NB Lab 714-715 (Earth)
Students will evaluate design solutions using a systematic process to compare their abilities to meet the needs and address the limitations posed by a problem.		3	Engineering Design (ELO #5)	NB Lab 714-715 (Earth)
Students will systematically evaluate solutions with respect to how well they meet the criteria and constraints of a problem.		3	Engineering Design (ELO #5)	NB Lab 714-715 (Earth) Humdinger Project

6th Grade Science Curriculum

Engineering, Technology, and Applications of Science **Next Generation Science Standards (NGSS):** **MS-ETS1-3 Engineering Design: Developing Possible Solutions**				
GLE/ Description: 6-8.ETS.1.B.2 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will analyze data from tests to compare and contrast design solutions for the purposes of combining the best components in a new solution to better meet the needs of the problem.		3	Engineering Design (ELO #5)	Humdinger Project
Students will systematically evaluate solutions with respect to how well they meet the criteria and constraints of a problem.		3	Engineering Design (ELO #5)	Humdinger Project
Students will create a combined solution superior to its predecessors.		3	Engineering Design (ELO #5)	Humdinger Project
Students will identify the most efficient characteristics of the designs in the redesign process.		3	Engineering Design (ELO #5)	Humdinger Project

6th Grade Science Curriculum

Engineering, Technology, and Applications of Science **Next Generation Science Standards (NGSS):** **MS-ETS1-4 Engineering Design: Developing Possible Solutions**				
GLE/ Description: 6-8.ETS.1.B.3 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.				
Measurable Learner Objective	**Integrated Skills/ Crosscutting**	**DOK**	**Unit**	**Instructional Strategies/Student Activities/ Resources (5 E Model)**
Students will develop a model to generate data to test ideas about designed systems including those representing inputs and outputs.		3	Engineering Design (ELO #5)	Lab 282-283 (Earth) Lab 202-203 (Earth) Lab 512-513 (Earth) Lab 632-633 (Earth) Humdinger Project
Students will develop a model to generate data for repeated testing and modification of a proposed object, tool, or process for the purpose of the achievement of optimal design.		3	Engineering Design (ELO #5)	Lab 282-283 (Earth) Lab 202-203 (Earth) Lab 512-513 (Earth) Lab 632-633 (Earth) Humdinger Project
Students will modify tests based on results.		3	Engineering Design (ELO #5)	Lab 282-283 (Earth) Lab 202-203 (Earth) Lab 512-513 (Earth) Lab 632-633 (Earth) Humdinger Project
Students will explain the importance of various model types.		3	Engineering Design (ELO #5)	Lab 282-283 (Earth) Lab 202-203 (Earth) Lab 512-513 (Earth) Lab 632-633 (Earth) Humdinger Project
Students will interpret the importance of refining solutions through the testing and modifying process.		3	Engineering Design (ELO #5)	Humdinger Project