Smithsonian

STC
Science and Technology Concepts™
MIDDLE SCHOOL

NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS OVERVIEW CORRELATION

STC Middle School™

CAROLINA®
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NYC Scope and Sequence for Grades 6–8

Grade 6	Grade 7	Grade 8
Weather and Climate Systems ESS2-4, ESS2-5, ESS2-6, ESS3-2, ESS3-4, ESS3-5, PS3-4, ETS1-1, ETS1-2	**Earth's Dynamic Systems** LS4-1, ESS1-4, ESS2-1, ESS2-2, ESS2-3, ESS3-1, ESS3-2, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Space Systems Exploration** PS2-4, ESS1-1, ESS1-2, ESS1-3, ETS1-1, ETS1-2
Ecosystems and Their Interactions LS1-5, LS1-6, LS2-1, LS2-2, LS2-3, LS2-4, LS2-5, LS4-4, LS4-6, ESS3-3, ETS1-1, ETS1-2	**Structure and Function** LS1-1, LS1-2, LS1-3, LS1-6, LS1-7, LS1-8, LS4-2, LS4-3	**Genes and Molecular Machines** LS1-1, LS1-4, LS3-1, LS3-2, LS4-4, LS4-5, LS4-6
Electricity, Waves, and Information Transfer LS1-8, PS2-3, PS2-5, PS3-3, PS3-4, PS3-5, PS3-6, PS4-1, PS4-2, PS4-3, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Matter and Its Interactions** PS1-1, PS1-2, PS1-3, PS1-4, PS1-5, PS1-6, PS1-7, PS1-8, PS3-4, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Energy, Forces, and Motion** PS2-1, PS2-2, PS2-3, PS2-5, PS3-1, PS3-2, PS3-5, ETS1-1, ETS1-2, ETS1-3, ETS1-4
		How Can We Use Technology to Monitor Aquatic Ecosystems? MS-PS4-1, MS-PS4-2, MS-PS4-3, MS-ESS3-4
		Where Do Whales Come From? MS-ESS1-4, MS-LS4-1, MS-LS4-2, MS-LS4-3

Three-Dimensional Learning for NYC

Smithsonian's STCMS Meets the Needs of NYSSLS

Grade 6	Grade 7	Grade 8
Unit 1: Electricity and Magnetism *Electricity, Waves, and Information Transfer* MS-PS2-3, MS-PS3-6 *Energy, Forces, and Motion* MS-PS2-5	**Unit 1: Structure and Properties of Matter** *Matter and Its Interactions* MS-PS1-1, MS-PS1-4, MS-PS1-7, MS-PS1-8	**Unit 1: Energy, Forces, and Motion** *Energy, Forces, and Motion* MS-PS2-1, MS-PS2-2, MS-PS3-1, MS-PS3-2, MS-PS3-5 *Space Systems Exploration* MS-PS2-4
Unit 2: Engineering and Energy Transformations *Matter and Its Interactions* MS-PS1-6, MS-PS3-4 *Electricity, Waves, and Information Transfer* MS-PS3-3	**Unit 2: Changing Properties of Matter** *Matter and Its Interactions* MS-PS1-2, MS-PS1-3, MS-PS1-5 *Structure and Function* MS-LS1-6, MS-LS-1-7	**Unit 2: Earth's Place in the Universe** *Space Systems Exploration* MS-PS2-4, MS-ESS1-1, MS-ESS1-2, MS-ESS1-3
Unit 3: Ecosystems *Ecosystems and Their Interactions* MS-LS2-1, MS-LS2-2, MS-LS2-3, MS-LS2-4, MS-LS2-5	**Unit 3: Structures of Life** *Structure and Function* MS-LS1-1, MS-LS1-2, MS-LS1-3, MS-LS1-3, MS-LS1-8	**Unit 3: Growth, Development, and Reproduction of Organisms** *Genes and Molecular Machines* MS-LS1-4, MS-LS3-1, MS-LS3-2 *Ecosystems and Their Interactions* MS-LS1-5
Unit 4: Investigating Weather and Climate *Matter and Its Interactions* MS-PS1-7 *Weather and Climate Systems* MS-ESS2-4, MS-ESS2-5, MS-ESS2-6	**Unit 4: Geology** *Earth's Dynamic Systems* MS-ESS1-4, MS-ESS2-1, MS-ESS2-2, MS-ESS2-3	**Unit 4: Evolution, Natural Selection, and Adaptations** *Where Do Whales Come From?* MS-LS4-1, MS-LS4-2, MS-LS4-3 *Genes and Molecular Machines* MS-LS4-4
Unit 5: Human Impact on Earth's Climate *Weather and Climate Systems* MS-ESS3-2, MS-ESS3-5 *Ecosystems and Their Interactions* MS-ESS3-3	**Unit 5: Minimizing Human Impact Through Engineering Design** *Earth's Dynamic Systems* MS-ESS3-1, MS-ESS3-2 *Ecosystems and Their Interactions* MS-ESS3-3 *Weather and Climate Systems* MS-ESS3-4	**Unit 5: Evolution of Technology in Science** *How Can We Use Technology to Monitor Aquatic Ecosystems?* MS-PS4-1, MS-PS4-2, MS-PS4-3 *Genes and Molecular Machines* MS-LS4-5 *Ecosystems and Their Interactions* MS-LS4-6

NYSSLS Overview Correlation Middle School Physical Science MS-PS1. Matter and Its Interactions	
Performance Expectation	**Correlation to STC for Middle School™**
MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 2 pgs. 17c–37b; Lesson 4 pgs. 61c–83b; Lesson 5 pgs. 83c–107b; Lesson 6 pgs. 107c–141; Lesson 10 pgs. 193a–218; Lesson 11 pgs. 219a–226a
MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 2 pgs. 17c–37b; Lesson 3 pgs. 37c–61b; Lesson 7 pgs. 141a–162; Lesson 9 pgs. 181c–192; Lesson 10 pgs. 193a–218; Lesson 11 pgs. 219a–226a
MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 10 pgs. 193a–218; Lesson 11 pgs. 219a–226a
MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 4 pgs. 61c–83b; Lesson 11 pgs. 219a–226a
MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 9 pgs. 181c–192; Lesson 11 pgs. 219a–226a
MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a
MS-PS1-7. Use evidence to illustrate that density is a property that can be used to identify samples of matter.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi-17b; Lesson 3 pgs. 37c–61b; Lesson 11 pgs. 219a-226a
MS-PS1-8. Plan and conduct an investigation to demonstrate that mixtures are combinations of substances.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi-17b; Lesson 2 pgs. 17c–37b; Lesson 6 pgs. 107c– 141; Lesson 11 pgs. 219a-226a
MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 6 pgs. 81a–103; Lesson 7 pgs. 103a–123; Lesson 9 pgs. 141a–153
MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	***Energy, Forces, and Motion*** **TE**: Lesson 1 pgs. iv–13; Lesson 2 pgs. 13a–31; Lesson 4 pgs. 49a–63; Lesson 6 pgs. 81a–103; Lesson 7 pgs. 103a–123; Lesson 9 pgs. 141a–153

MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 3 pgs. 31a–49 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 2 pgs. 19a–41; Lesson 3 pgs. 41a–65; Lesson 4 pgs. 65a–91; Lesson 10 pgs. 201c–219a
MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	***Space Systems Exploration*** **TE:** Lesson 1 pgs. 1a–17; Lesson 4 pgs. 57a–77; Lesson 7 pgs. 127a–147; Lesson 8 pgs. 147a–167; Lesson 10 pgs. 187a–193
MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 3 pgs. 31a–49; ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 4 pgs. 65a–91; Lesson 10 pgs. 201c-219a
MS-PS3. Energy	
MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 5 pgs. 63a–81; Lesson 9 pgs. 141a–153
MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 5 pgs. 63a–81; Lesson 9 pgs. 141a–153
MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	***Electricity, Waves, and Information Transfer*** **TE:** Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c-219a
MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	***Matter and Its Interactions*** **TE:** Lesson 1 pgs. vi–17b; Lesson 4 pgs. 61c–83b; Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c–219a ***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 2 pgs. 9a–23; Lesson 12 pgs. 199a–205

MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 2 pgs. 13a–31; Lesson 5 pgs. 63a–81; Lesson 7 pgs. 103a–123; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 4 pgs. 65a–91; Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c–219a
MS-PS3-6. Make observations to provide evidence that energy can be transferred by electric currents.	***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi-19; Lesson 4 pgs. 65a-91; Lesson 5 pgs. 91a-115a
MS-PS4. Waves and Their Applications in Technologies for Information Transfer	
MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 6 pgs. 115c–135a; Lesson 7 pgs. 135c-157a; Lesson 10 pgs. 201c–219a ***How Can We Use Technology to Monitor Aquatic Ecosystems?*** **TE:** Investigation 6
MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 8 pgs. 157c-177; Lesson 10 pgs. 201c–219a ***How Can We Use Technology to Monitor Aquatic Ecosystems?*** **TE:** Investigation 4; Investigation 5
MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.	***Electricity, Waves, and Information Transfer*** **TE:** Lesson 8 pgs. 157c–177; Lesson 10 pgs. 201c-219a ***How Can We Use Technology to Monitor Aquatic Ecosystems?*** **TE:** Investigation 7; Investigation 8

Middle School Life Science	
MS-LS1. From Molecules to Organisms: Structures and Processes	
Performance Expectation	**Correlation to STC for Middle School™**
MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 2 pgs. 15a–43a; Lesson 8 pgs. 165a–171a ***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 2 pgs. 17a–33b; Lesson 11 pgs. 181a–186
MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 3 pgs. 43c–65; Lesson 8 pgs. 165a–171a
MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 6 pgs. 111a–141; Lesson 7 pgs. 141a–165; Lesson 8 pgs. 165a–171a
MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 7 pgs. 111a–129; Lesson 11 pgs. 181a–186
MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249
MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 4 pgs. 65a–91; Lesson 8 pgs. 165a–171a ***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 4 pgs. 79a–97; Lesson 5 pgs. 97a–125; Lesson 11 pgs. 243a–249
MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 5 pgs. 91a–111; Lesson 8 pgs. 165a–171a
MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 7 pgs. 141a–165; Lesson 8 pgs. 165a–171a ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 9 pgs. 177a–201b; Lesson 10 pgs. 201c–219a

MS-LS2. Ecosystems: Interactions, Energy, and Dynamics	
MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 2 pgs. 27a–49; Lesson 3 pgs. 49a–71; Lesson 6 pgs. 125a–147; Lesson 11 pgs. 243a–249
MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 6 pgs. 125a–147; Lesson 11 pgs. 243a–249
MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 4 pgs. 79a–97; Lesson 5 pgs. 97a–125; Lesson 11 pgs. 243a–249
MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 7 pgs. 147a–179; Lesson 11 pgs. 243a–249
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 9 pgs. 199a–221; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249
MS-LS3. Heredity: Inheritance and Variation of Traits	
MS-LS3-1. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 6 pgs. 87c–111; Lesson 11 pgs. 181a–186
MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 3 pgs. 33c–49; Lesson 4 pgs. 49a–67; Lesson 5 pgs. 67a–87b; Lesson 8 pgs. 129a–141; Lesson 11 pgs. 181a–186
MS-LS4. Biological Evolution: Unity and Diversity	
MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 1a–13a; Lesson 9 pgs. 241c–275a; Lesson 12 pgs. 319c–329 ***Where Do Whales Come From?*** **TE:** Investigations under development
MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 6 pgs. 111a–141; Lesson 8 pgs. 165a–171a ***Where Do Whales Come From?*** **TE:** Investigations under development

MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	***Structure and Function*** **TE:** Lesson 1 pgs. 1a–15; Lesson 2 pgs. 15a–43a; Lesson 8 pgs. 165a–171a ***Where Do Whales Come From?*** **TE:** Investigations under development
MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 8 pgs. 179a–199; Lesson 11 pgs. 243a–249 ***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 9 pgs. 141a–165; Lesson 11 pgs. 181a–186
MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 9 pgs. 141a–165; Lesson 10 pgs. 165a–181; Lesson 11 pgs. 181a–186
MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 8 pgs. 179a–199; Lesson 11 pgs. 243a–249 ***Genes and Molecular Machines*** **TE:** Lesson 1 pgs. 1a–17; Lesson 9 pgs. 141a–165; Lesson 11 pgs. 181a–187

Middle School Earth/Space Science	
MS-ESS1. Earth's Place in the Universe	
Performance Expectation	**Correlation to STC for Middle School™**
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.	***Space Systems Exploration*** **TE:** Lesson 1 pgs. 1a–17; Lesson 2 pgs. 17a–35; Lesson 3 pgs. 35a–57; Lesson 4 pgs. 57a–77; Lesson 5 pgs. 77a–95; Lesson 10 pgs. 187a–193
MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	***Space Systems Exploration*** **TE:** Lesson 1 pgs. 1a–17; Lesson 7 pgs. 127a–147; Lesson 8 pgs. 147a–167; Lesson 10 pgs. 187a–193
MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.	***Space Systems Exploration*** **TE:** Lesson 1 pgs. 1a–17; Lesson 6 pgs. 95a–127; Lesson 10 pgs. 187a–193
MS-ESS1-4. 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.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 1a–13a; Lesson 9 pgs. 241c–275a; Lesson 11 pgs. 295c–319a; Lesson 12 pgs. 319c–329 ***Where Do Whales Come From?*** **TE:** Investigations under development
MS-ESS2. Earth's Systems	
MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 1a–13a; Lesson 5 pgs. 117c–147a; Lesson 12 pgs. 319c–329
MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 2–13; Lesson 3 pgs. 40–73; Lesson 4 pgs. 74–117; Lesson 5 pgs. 118–147; Lesson 6 pgs. 148–181; Lesson 7 pgs. 182–209; Lesson 8 pgs. 210–241; Lesson 11 pgs. 296–319; Lesson 12 pgs. 320–329
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.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 2–13; Lesson 4 pgs. 74–117; Lesson 11 pgs. 296–319; Lesson 12 pgs. 320–329
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.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 3 pgs. 23a–41; Lesson 12 pgs. 199a–205

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 3 pgs. 23a–41; Lesson 4 pgs. 41a–63a; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 8 pgs. 117c–139; Lesson 12 pgs. 199a–205
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.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 2 pgs. 9a–23; Lesson 4 pgs. 41a–63a; Lesson 5 pgs. 63c–81; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 9 pgs. 139a–153; Lesson 12 pgs. 199a–205
MS-ESS3. Earth and Human Activity	
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.	***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 1a–13a; Lesson 10 pgs. 275c–295a; Lesson 12 pgs. 319c–329
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.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 8 pgs. 117c–139; Lesson 12 pgs. 199a–205 ***Earth's Dynamic Systems*** **TE:** Lesson 1 pgs. 1a–13a; Lesson 2 pgs. 13c–39a; Lesson 3 pgs. 39c–73a; Lesson 4 pgs. 73c–117a; Lesson 6 pgs. 147a–181; Lesson 7 pgs. 181a–209a; Lesson 12 pgs. 319c–329
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	***Ecosystems and Their Interactions*** **TE:** Lesson 1 pgs. 1a–27; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249
MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 11 pgs. 175c–199; Lesson 12 pgs. 199a–205 ***How Can We Use Technology to Monitor Aquatic Ecosystems?*** **TE:** Investigation 3; Investigation 6; Investigation 7; Investigation 9
MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	***Weather and Climate Systems*** **TE:** Lesson 1 pgs. vi–9; Lesson 10 pgs. 153a–175b; Lesson 12 pgs. 199a–205

Middle School Engineering Design	
MS-ETS1. Engineering Design	
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.	***Matter and Its Interactions*** **TE:** Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a ***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 1 pgs. vi–19; Lesson 5 pgs. 91a–115a; Lesson 8 pgs. 157c–177; Lesson 10 pgs. 201c-219a ***Ecosystems and Their Interactions*** **TE:** Lesson 2 pgs. 27a–49; Lesson 9 pgs. 199a–221; Lesson 11 pgs. 243a–249 ***Space Systems Exploration*** **TE:** Lesson 6 pgs. 95a–127; Lesson 9 pgs. 167a–187; Lesson 10 pgs. 187a–193 ***Weather and Climate Systems*** **TE:** Lesson 8 pgs. 117c–139 ***Earth's Dynamic Systems*** **TE:** Lesson 2 pgs. 13c–39a
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	***Matter and Its Interactions*** **TE:** Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a ***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 5 pgs. 91a–115a; Lesson 8 pgs. 157c–177 ***Ecosystems and Their Interactions*** **TE:** Lesson 11 pgs. 243a–249 ***Space Systems Exploration*** **TE:** Lesson 10 pgs. 187a–193 ***Weather and Climate Systems*** **TE:** Lesson 8 pgs. 117c–139 ***Earth's Dynamic Systems*** **TE:** Lesson 2 pgs. 13c–39a

MS-ETS1-3. 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.	***Matter and Its Interactions*** **TE:** Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a ***Energy, Forces, and Motion*** **TE:** Lesson 1 pgs. iv–13; Lesson 6 pgs. 81a–103; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 5 pgs. 91a–115a; Lesson 8 pgs. 157c–177 ***Earth's Dynamic Systems*** **TE:** Lesson 2 pgs. 13c–39a
MS-ETS1-4. 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.	***Matter and Its Interactions*** **TE:** Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a ***Energy, Forces, and Motion*** **TE:** Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 ***Electricity, Waves, and Information Transfer*** **TE:** Lesson 5 pgs. 91a–115a; Lesson 8 pgs. 157c–177 ***Earth's Dynamic Systems*** **TE:** Lesson 2 pgs. 13c–39a

NOTES

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NYC Scope and Sequence for Grades 6–8

Grade 6	Grade 7	Grade 8
Weather and Climate Systems ESS2-4, ESS2-5, ESS2-6, ESS3-2, ESS3-4, ESS3-5, PS3-4, ETS1-1, ETS1-2	**Earth's Dynamic Systems** LS4-1, ESS1-4, ESS2-1, ESS2-2, ESS2-3, ESS3-1, ESS3-2, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Space Systems Exploration** PS2-4, ESS1-1, ESS1-2, ESS1-3, ETS1-1, ETS1-2
Ecosystems and Their Interactions LS1-5, LS1-6, LS2-1, LS2-2, LS2-3, LS2-4, LS2-5, LS4-4, LS4-6, ESS3-3, ETS1-1, ETS1-2	**Structure and Function** LS1-1, LS1-2, LS1-3, LS1-6, LS1-7, LS1-8, LS4-2, LS4-3	**Genes and Molecular Machines** LS1-1, LS1-4, LS3-1, LS3-2, LS4-4, LS4-5, LS4-6
Electricity, Waves, and Information Transfer LS1-8, PS2-3, PS2-5, PS3-3, PS3-4, PS3-5, PS3-6, PS4-1, PS4-2, PS4-3, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Matter and Its Interactions** PS1-1, PS1-2, PS1-3, PS1-4, PS1-5, PS1-6, PS1-7, PS1-8, PS3-4, ETS1-1, ETS1-2, ETS1-3, ETS1-4	**Energy, Forces, and Motion** PS2-1, PS2-2, PS2-3, PS2-5, PS3-1, PS3-2, PS3-5, ETS1-1, ETS1-2, ETS1-3, ETS1-4
		How Can We Use Technology to Monitor Aquatic Ecosystems? MS-PS4-1, MS-PS4-2, MS-PS4-3, MS-ESS3-4
		Where Do Whales Come From? MS-ESS1-4, MS-LS4-1, MS-LS4-2, MS-LS4-3

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