

A Correlation of  
**Elevate Science**  
Grade 7, ©2019



To the  
**Next Generation Science Standards**  
DCI (Disciplinary Core Idea) Arrangement

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To the  
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**Introduction**

This document demonstrates how ***Elevate Science* ©2019** meets the Next Generation Science Standards, grades 6-8. Correlation page references are to the Student and Teacher's Editions and cited at the page level.

Pearson is proud to introduce ***Elevate Science*** Middle Grades – where exploration is the heart of science! Designed to address the rigors of new science standards, students will experience science up close and personal, using real-world, relevant phenomena to solve project-based problems. Our newest program prepares students for the challenges of tomorrow, building strong reasoning skills and critical thinking strategies as they engage in explorations, formulate claims, and gather and analyze data that promote evidence-based arguments. The blended print and digital curriculum covers all Next Generation Science Standards at every grade level.

***Elevate Science*** helps teachers transform learning, promote innovation, and manage their classroom.

**Transform** science classrooms by immersing students in active, three-dimensional learning.

*Elevate Science* engages students with real-world tasks, open-ended Quests, uDemonstrate performance-based labs, and in the engineering/design process with uEngineer It! investigations.

- A new 3-D learning model enhances best practices.
- Engineering-focused features infuse STEM learning.
- Phenomena-based activities put students at the heart of a Quest for knowledge.

**Innovate** learning by focusing on 21st century skills.

Students are encouraged to think, collaborate, and innovate! With ***Elevate Science***, students explore STEM careers, experience engineering activities, and discover our scientific and technological world. The content, strategies, and resources of *Elevate Science* equip the science classroom for scientific inquiry and science and engineering practices.

- Problem-based learning Quests put students on a journey of discovery.
- STEM connections help integrate curriculum.
- Coding and innovation engage students and build 21st century skills.

**Manage** the classroom with confidence.

Teachers will lead their class in asking questions and engaging in argumentation. Evidence-based assessments provide new options for monitoring student understanding.

- Professional development offers practical point-of-use support.
- Embedded standards in the program allow for easy integration.
- ELL and differentiated instruction strategies help instructors reach every learner.
- Interdisciplinary connections relate science to other subjects.

Designed for today's classroom, preparing students for tomorrow's world. ***Elevate Science*** promises to:

- Elevate thinking.
- Elevate learning.
- Elevate teaching.

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-PS2 Motion and Stability: Forces and Interactions</b>	
<b>Performance Expectation MS-PS2-3.</b>	
Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	<b>SE/TE:</b> 450–453, 454–457, 472–479, 480–489, 490–495
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS2.B: Types of Interactions</b> Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects.	<b>SE/TE:</b> 450–453, 454–457, 462, 464–466, 467–471, 472–478, 480–489, 490–495
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Asking Questions and Defining Problems</b> Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.	<b>SE/TE:</b> 6–7, 24, 106, 259, 450–453, 472–478, 480–489, 490–495
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect: Mechanism and Prediction</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.	<b>SE/TE:</b> 450–453, 472–478, 480–489, 490–495

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-PS2-5.</b>	
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.	<b>SE/TE:</b> 450–453, 454–462, 464–471, 492–495, 496–499
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS2.B: Types of Interactions</b> Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively).	<b>SE/TE:</b> 450–453, 454–462, 464–471, 492–495, 496–499
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Planning and Carrying Out Investigations</b> Conduct an investigation and evaluate the experimental design to produce data to serve as the basis for evidence that can meet the goals of the investigation.	<b>SE/TE:</b> 450–453, 454–462, 464–471, 492–495, 496–499
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect: Mechanism and Prediction</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.	<b>SE/TE:</b> 450–453, 454–462, 464–471, 492–495, 496–499

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Energy</b>	
<b>Performance Expectation MS-PS3-1.</b>	
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.	<b>SE/TE:</b> 180–181, 221, 352
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS3.A: Definitions of Energy</b> Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.	<b>SE/TE:</b> 180–181, 221, 352
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Analyzing and Interpreting Data</b> Construct and interpret graphical displays of data to identify linear and nonlinear relationships.	<b>SE/TE:</b> 143, 165, 178, 180–181, 184–185, 198, 202–203, 241, 260, 266–267, 271, 280–281, 304, 375, 529, 538–539
<b>CROSSCUTTING CONCEPT</b>	
<b>Scale, Proportion, and Quantity</b> Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.	<b>SE/TE:</b> 361, 375

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-PS3-2.</b>	
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.	<b>SE/TE:</b> 452–462, 464–471, 492–495, 496–499
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS3.A: Definitions of Energy</b> A system of objects may also contain stored (potential) energy, depending on their relative positions. <b>PS3.C: Relationship Between Energy and Forces</b> When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.	<b>SE/TE:</b> 452–462, 464–471, 492–495, 496–499
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop a model to describe unobservable mechanisms.	<b>SE/TE:</b> 62–63, 452–462, 464–471, 492–495, 496–499, 532
<b>CROSSCUTTING CONCEPT</b>	
<b>Systems and System Models</b> Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.	<b>SE/TE:</b> 28, 209, 452–462, 464–471, 492–495, 496–499

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Waves and Electromagnetic Radiation</b>	
<b>Performance Expectation MS-PS4-1.</b>	
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.	<b>SE/TE:</b> 388-391, 392-399, 442-445
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS4.A: Wave Properties</b> A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude.	<b>SE/TE:</b> 392-399, 412-421
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Using Mathematics and Computational Thinking</b> Use mathematical representations to describe and/or support scientific conclusions and design solutions. <b>Connection to Nature of Science</b> Science knowledge is based upon logical and conceptual connections between evidence and explanations.	<b>SE/TE:</b> 392-399, 524-525
<b>CROSSCUTTING CONCEPT</b>	
<b>Patterns</b> Graphs and charts can be used to identify patterns in data.	<b>SE/TE:</b> 165, 198, 202-203, 241, 260, 271, 280-281, 352, 392-399, 529, 538-539



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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-PS4-2.</b>	
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	<b>SE/TE:</b> 388–391, 402–410, 411, 412–421, 422–430, 432–441, 442–449
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS4.B: Electromagnetic Radiation</b> <ul style="list-style-type: none"> <li>• When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object’s material and the frequency (color) of the light.</li> <li>• The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.</li> <li>• A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media.</li> <li>• However, because light can travel through space, it cannot be a matter wave, like sound or water waves.</li> </ul>	<b>SE/TE:</b> 402–410, 413–416, 421, 422–430, 432–441, 444–445
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop and use a model to describe phenomena.	<b>SE/TE:</b> 62–63, 402–410, 412–421, 422–430, 432–441, 532
<b>CROSCUTTING CONCEPT</b>	
<b>Structure and Function</b> Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.	<b>SE/TE:</b> 402–410, 412–421, 422–430, 432–441

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-PS4-3.</b>	
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.	<b>SE/TE:</b> 500-503, 504-512, 514-523, 524-525, 526-534, 536-539, 540-543
<b>DISCIPLINARY CORE IDEA</b>	
<b>PS4.C: Information Technologies and Instrumentation</b> Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.	<b>SE/TE:</b> 500-503, 504-512, 514-523, 526-534, 535, 536-539, 540-543
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Obtaining, Evaluating, and Communicating Information</b> Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings.	<b>SE/TE:</b> 500-503, 504-512, 514-523, 526-534, 536-539, 540-543
<b>CROSCUTTING CONCEPT</b>	
<b>Structure and Function</b> Structures can be designed to serve particular functions. <b>Connections to Engineering, Technology, and Applications of Science</b> Technologies extend the measurement, exploration, modeling, and computational capacity of scientific investigations. <b>Connections to Nature of Science</b> Advances in technology influence the progress of science and science has influenced advances in technology.	<b>SE/TE:</b> 500-503, 504-512, 514-523, 526-534, 536-539, 540-543

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-LS1 From Molecules to Organisms: Structures and Processes</b>	
<b>Performance Expectation MS-LS1-1.</b>	
Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	<b>SE/TE:</b> 1–12, 60–67
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.A: Structure and Function</b> All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).	<b>SE/TE:</b> 4–12, 21–22
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Planning and Carrying Out Investigations</b> Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.	<b>SE/TE:</b> 4–12, 282–285
<b>CROSSCUTTING CONCEPT</b>	
<b>Scale, Proportion, and Quantity</b> Phenomena that can be observed at one scale may not be observable at another scale. <b>Connections to Engineering, Technology, and Applications of Science</b> 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.	<b>SE/TE:</b> 4–12, 159, 277, 379, 479, 502–503, 513

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-LS1-2.</b>	
Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	<b>SE/TE:</b> 1-12, 14-23, 24-31, 32-39, 60-63
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.A: Structure and Function</b> Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	<b>SE/TE:</b> 4-12, 14-23, 24-31, 32-39
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop and use a model to describe phenomena.	<b>SE/TE:</b> 4-12, 14-23, 24-31, 32-39
<b>CROSSCUTTING CONCEPT</b>	
<b>Structure and Function</b> Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	<b>SE/TE:</b> 4-12, 14-23, 24-31, 32-39, 64-67, 130-131

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-LS1-3.</b>	
Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	<b>SE/TE:</b> 1-3, 68-71, 72-80, 82-91, 92-93, 94-104, 106-117, 128-131, 132-135
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.A: Structure and Function</b> In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.	<b>SE/TE:</b> 21-23, 68-71, 72-80, 82-91, 94-104, 106-117, 128-131, 132-135
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Engaging in Argument from Evidence</b> Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.	<b>SE/TE:</b> 68-71, 72-80, 82-91, 94-104, 106-117, 128-131, 132-135
<b>CROSCUTTING CONCEPT</b>	
<b>Systems and System Models</b> Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. <b>Connections to Nature of Science</b> Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas.	<b>SE/TE:</b> 68-71, 72-80, 81, 82-91, 94-104, 106-117, 128-131, 132-135

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<b>Performance Expectation MS-LS1-4.</b>	
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.	<b>SE/TE:</b> 136–137, 150–158, 160–168, 182–185
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.B: Growth and Development of Organisms</b> <ul style="list-style-type: none"> <li>• Animals engage in characteristic behaviors that increase the odds of reproduction.</li> <li>• Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.</li> </ul>	<b>SE/TE:</b> 140, 150–158, 160–168, 179
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Engaging in Argument from Evidence</b> Construct and present oral and written arguments 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.	<b>SE/TE:</b> 150–158, 160–168
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect: Mechanism and Prediction</b> Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	<b>SE/TE:</b> 150–158, 160–168

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<b>Performance Expectation MS-LS1-5.</b>	
Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	<b>SE/TE:</b> 136–139, 170–179, 180–181, 182–185, 186–189
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.B: Growth and Development of Organisms</b> Genetic factors as well as local conditions affect the growth of the adult plant.	<b>SE/TE:</b> 170–179
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Constructing Explanations and Designing Solutions</b> 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.	<b>SE/TE:</b> 170–179
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect: Mechanism and Prediction</b> Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	<b>SE/TE:</b> 170–179

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<b>Performance Expectation MS-LS1-6.</b>	
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.	<b>SE/TE:</b> 1, 40–48, 49, 60–61, 214
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b> Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use.</p> <p><b>PS3.D: Energy in Chemical Processes and Everyday Life</b> The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. (secondary to MS-LS1-6)</p>	<b>SE/TE:</b> 40–48, 59, 218, 222, 254, 272
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Constructing Explanations and Designing Solutions</b> 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.</p> <p><b>Connection to Nature of Science</b> Science knowledge is based upon logical connections between evidence and explanations.</p>	<b>SE/TE:</b> 32, 40–48



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<b>CROSSCUTTING CONCEPT</b>	
<b>Energy and Matter</b> Within a natural system, the transfer of energy drives the motion and/or cycling of matter.	<b>SE/TE:</b> 40–48, 214
<b>Performance Expectation MS-LS1-7.</b>	
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.	<b>SE/TE:</b> 1, 40–48, 50–57, 58–59, 60–61, 94
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.C: Organization for Matter and Energy Flow in Organisms</b> Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. <b>PS3.D: Energy in Chemical Processes and Everyday Life</b> Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. (secondary to MS-LS1-7)	<b>SE/TE:</b> 50–57, 59, 94, 218, 222
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop a model to describe unobservable mechanisms.	<b>SE/TE:</b> 50–57
<b>CROSSCUTTING CONCEPT</b>	
<b>Energy and Matter</b> Matter is conserved because atoms are conserved in physical and chemical processes.	<b>SE/TE:</b> 50–57

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<b>Performance Expectation MS-LS1-8.</b>	
Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	<b>SE/TE:</b> 68-71, 72-80, 85, 118-127, 128-131, 132-135
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS1.D: Information Processing</b> Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	<b>SE/TE:</b> 68-71, 72-80, 83, 85, 118-127, 128-131, 132-135
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Obtaining, Evaluating, and Communicating Information</b> Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.	<b>SE/TE:</b> 68-71, 72-80, 118-127, 128-131, 132-135
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect</b> Cause and effect relationships may be used to predict phenomena in natural systems.	<b>SE/TE:</b> 68-71, 72-80, 118-127, 128-131, 132-135, 184-185

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-LS2 Ecosystems: Interactions, Energy, Dynamics</b>	
<b>Performance Expectation MS-LS2-1.</b>	
Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	<b>SE/TE:</b> 190–193, 194–201, 202–203, 224–225, 228–231, 232–233, 241, 245–252, 278–285
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS2.A: Interdependent Relationships in Ecosystems</b> <ul style="list-style-type: none"> <li>• Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.</li> <li>• In any ecosystem, 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.</li> <li>• Growth of organisms and population increases are limited by access to resources.</li> </ul>	<b>SE/TE:</b> 171–174, 177–179, 190–191, 194–201, 241, 243, 246–252, 265–267
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Analyzing and Interpreting Data</b> Analyze and interpret data to provide evidence for phenomena.	<b>SE/TE:</b> 194–201, 246–252
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.	<b>SE/TE:</b> 194–201, 246–252

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-LS2-2.</b>	
Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	<b>SE/TE:</b> 201, 212, 232–233, 236, 239, 243, 245–252, 266–267, 278–279, 282–285
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS2.A: Interdependent Relationships in Ecosystems</b> Similarly, 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 these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared.	<b>SE/TE:</b> 237–238, 239–241, 242–244, 246–252, 265, 266–267
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Constructing Explanations</b> Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena.	<b>SE/TE:</b> 246–252
<b>CROSSCUTTING CONCEPT</b>	
<b>Patterns</b> Patterns can be used to identify cause and effect relationships.	<b>SE/TE:</b> 130–131, 246–252, 382–383, 520, 529

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<b>Performance Expectation MS-LS2-3.</b>	
Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	<b>SE/TE:</b> 1, 40–48, 49, 60–61, 190–193, 204–212, 213, 214–222, 224–231, 268–276, 282–285
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS2.B: Cycle of Matter and Energy Transfer in Ecosystems</b> Food webs are models that 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 plant or animal matter back to the soil in terrestrial environments or to 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.	<b>SE/TE:</b> 204–212, 214–222, 224–227, 228–231, 239–241, 242–244, 265
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop a model to describe phenomena.	<b>SE/TE:</b> 204–212, 214–222, 268–276
<b>CROSSCUTTING CONCEPT</b>	
<b>Energy and Matter</b> The transfer of energy can be tracked as energy flows through a natural system. <b>Connection to Nature of Science</b> Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	<b>SE/TE:</b> 130–131, 184–185, 204–212, 214–222

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<b>Performance Expectation MS-LS2-4.</b>	
Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	<b>SE/TE:</b> 232-233, 246-252, 254-265, 266-267, 274, 278-285
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b> 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 its populations.	<b>SE/TE:</b> 180-181, 202-203, 246-252, 254-265
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Engaging in Argument from Evidence</b> 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. <b>Connection to Nature of Science</b> Science disciplines share common rules of obtaining and evaluating empirical evidence.	<b>SE/TE:</b> 246-252, 254-265
<b>CROSSCUTTING CONCEPT</b>	
<b>Stability and Change</b> Small changes in one part of a system might cause large changes in another part.	<b>SE/TE:</b> 246-252, 254-265

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>Performance Expectation MS-LS2-5.</b>	
Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	<b>SE/TE:</b> 232–235, 254–265, 268–276, 277
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b> 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.</p> <p><b>LS4.D: Biodiversity and Humans</b> Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5)</p> <p><b>ETS1.B: Developing Possible Solutions</b> There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)</p>	<b>SE/TE:</b> 94, 254–265, 268–276
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Engaging in Argument from Evidence</b> Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.</p>	<b>SE/TE:</b> 254–265, 268–276

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<b>CROSSCUTTING CONCEPT</b>	
<p><b>Stability and Change</b> Small changes in one part of a system might cause large changes in another part.</p> <p><b>Connections to Engineering, Technology, and Applications of Science</b> The use of technologies and any 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. Thus technology use varies from region to region and over time.</p> <p><b>Connections to Nature of Science</b> Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.</p>	<p><b>SE/TE:</b> 254–265, 268–276</p>



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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-LS3 Heredity: Inheritance and Variation of Traits</b>	
<b>Performance Expectation MS-LS3-2.</b>	
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.	<b>SE/TE:</b> 136–137, 140–149, 154, 158, 182–183
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>LS3.A: Inheritance of Traits</b> Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.</p> <p><b>LS3.B: Variation of Traits</b> In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.</p> <p><b>LS1.B: Growth and Development of Organisms</b> Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MS-LS3-2)</p>	<b>SE/TE:</b> 140–149, 154, 158, 182–183
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Developing and Using Models</b> Develop and use a model to describe phenomena.</p>	<b>SE/TE:</b> 140–149
<b>CROSSCUTTING CONCEPT</b>	
<p><b>Cause and Effect</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.</p>	<b>SE/TE:</b> 140–149

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-LS4 Biological Evolution: Unity and Diversity</b>	
<b>Performance Expectation MS-LS4-4.</b>	
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.	<b>SE/TE:</b> 147, 149
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS4.B: Natural Selection</b> Natural selection leads to the predominance of certain traits in a population, and the suppression of others.	<b>SE/TE:</b> 237–238
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Constructing Explanations and Designing Solutions</b> Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena.	<b>SE/TE:</b> 147, 149
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect</b> Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	<b>SE/TE:</b> 147, 149

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<b>Performance Expectation MS-LS4-6.</b>	
Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	<b>SE/TE:</b> 237–238
<b>DISCIPLINARY CORE IDEA</b>	
<b>LS4.C: Adaptation</b> Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.	<b>SE/TE:</b> 147–148, 237–238, 252
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Using Mathematics and Computational Thinking</b> Use mathematical representations to support scientific conclusions and design solutions.	<b>SE/TE:</b> 35, 211
<b>CROSSCUTTING CONCEPT</b>	
<b>Cause and Effect</b> Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	<b>SE/TE:</b> 237–238

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>MS-ESS1 Earth and Human Activity</b>	
<b>Performance Expectation MS-ESS3-1.</b>	
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.	<b>SE/TE:</b> 286–289, 290–299, 300–306, 308–317, 318–324, 326–333, 371, 378, 380–381
<b>DISCIPLINARY CORE IDEA</b>	
<b>ESS3.A: Natural Resources</b> 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.	<b>SE/TE:</b> 286–287, 288–289, 290–299, 306, 316–317, 300–306, 307, 308–315, 318–324, 342–343, 345, 352, 367, 378, 380–381
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Constructing Explanations and Designing Solutions</b> 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.	<b>SE/TE:</b> 290–299, 300–306, 308–315, 318–324

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Next Generation Science Standards	Elevate Science ©2019
<b>CROSCUTTING CONCEPT</b>	
<p><b>Cause and Effect: Mechanism and Prediction</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.</p> <p><b>Connections to Engineering, Technology, and Applications of Science</b> 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.</p>	<b>SE/TE:</b> 290–299, 300–306, 308–315, 318–324
<b>Human Impacts</b>	
<b>Performance Expectation MS-ESS3-3.</b>	
Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	<b>SE/TE:</b> 138–139, 158, 277, 307, 345
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>ESS3.C: Human Impacts on Earth Systems</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.</li> </ul>	<b>SE/TE:</b> 138–139, 261–264, 299–300, 306–307, 338–339, 342, 345, 352
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Constructing Explanations and Designing Solutions</b> Apply scientific principles to design an object, tool, process or system.</p>	<b>SE/TE:</b> 138–139, 158, 277, 307, 345

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>CROSCUTTING CONCEPT</b>	
<p><b>Cause and Effect</b> Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.</p> <p><b>Connections to Engineering, Technology, and Applications of Science</b> The uses of technologies and any 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. Thus technology use varies from region to region and over time.</p>	<b>SE/TE:</b> 130–131, 184–185
<b>Performance Expectation MS-ESS3-4.</b>	
Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	<b>SE/TE:</b> 286–287, 290–299, 300–306, 308–317, 318–324, 326–327, 334–337, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>ESS3.C: Human Impacts on Earth Systems</b> Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.</p>	<b>SE/TE:</b> 290–299, 300–306, 308–315, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Engaging in Argument from Evidence</b> Construct and present oral and written arguments 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.</p>	<b>SE/TE:</b> 300–306, 308–315, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387

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<b>Next Generation Science Standards</b>	<b>Elevate Science ©2019</b>
<b>CROSSCUTTING CONCEPT</b>	
<p><b>Cause and Effect</b> Cause and effect relationships may be used to predict phenomena in natural or designed systems.</p> <p><b>Connections to Engineering, Technology, and Applications of Science</b> 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.</p> <p><b>Connections to Nature of Science</b> Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.</p>	<p><b>SE/TE:</b> 290–299, 300–306, 308–315, 318–324, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387</p>

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<b>Engineering Design</b>	
<b>Performance Expectation MS-ETS1-1.</b>	
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.	<b>SE/TE:</b> 64–67, 234–235, 252, 265, 288–289, 330–333, 513
<b>DISCIPLINARY CORE IDEA</b>	
<b>ETS1.A: Defining and Delimiting Engineering Problems</b> 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. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	<b>SE/TE:</b> 64–67, 234–235, 252, 265, 288–289, 330–333, 513
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Asking Questions and Defining Problems</b> 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.	<b>SE/TE:</b> 64–67, 234–235, 252, 265, 288–289, 330–333, 513



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Next Generation Science Standards	Elevate Science ©2019
<b>CROSSCUTTING CONCEPT</b>	
<p><b>Influence of Science, Engineering, and Technology on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>	<b>SE/TE:</b> 330–333, 344, 356, 357–358, 380–381, 532
<b>Performance Expectation MS-ETS1-2.</b>	
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	<b>SE/TE:</b> 252, 265, 479, 489, 513, 540–543
<b>DISCIPLINARY CORE IDEA</b>	
<p><b>ETS1.B: Developing Possible Solutions</b></p> <p>There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.</p>	<b>SE/TE:</b> 252, 265, 479, 489, 513, 540–543
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<p><b>Engaging in Argument from Evidence</b></p> <p>Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.</p>	<b>SE/TE:</b> 252, 265, 479, 489, 513, 540–543

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<b>Performance Expectation MS-ETS1-3.</b>	
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.	<b>SE/TE:</b> 489, 513
<b>DISCIPLINARY CORE IDEA</b>	
<b>ETS1.B: Developing Possible Solutions</b> • There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. • Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors.	<b>SE/TE:</b> 489, 513
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Analyzing and Interpreting Data</b> Analyze and interpret data to determine similarities and differences in findings.	<b>SE/TE:</b> 489, 513
<b>Performance Expectation MS-ETS1-4.</b>	
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.	<b>SE/TE:</b> 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543
<b>DISCIPLINARY CORE IDEA</b>	
<b>ETS1.B: Developing Possible Solutions</b> • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4) • Models of all kinds are important for testing solutions. (MSETS1-4)	<b>SE/TE:</b> 49, 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543
<b>SCIENCE AND ENGINEERING PRACTICE</b>	
<b>Developing and Using Models</b> Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.	<b>SE/TE:</b> 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543