A Correlation of

Elevate Science

Grade 7, ©2019

To the

Next Generation Science Standards

Topic Arrangement

Pearson

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Next Generation Science Standards, Topic Arrangement

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.

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

Table of Contents

Next Generation Science Standards	**Elevate Science ©2019**
Structure, Function, and Information Processing	
Performance Expectation 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.	**SE/TE:** 1–12, 60–67
DISCIPLINARY CORE IDEA	
LS1.A: Structure and Function 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).	**SE/TE:** 4–12, 21–22
SCIENCE AND ENGINEERING PRACTICE	
Planning and Carrying Out Investigations Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.	**SE/TE:** 4–12, 282–285
CROSSCUTTING CONCEPT	
Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. **Connections to Engineering, Technology, and Applications of Science** 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.	**SE/TE:** 4–12, 159, 277, 379, 479, 502–503, 513

Next Generation Science Standards	Elevate Science ©2019
Performance Expectation 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.	**SE/TE:** 1–12, 14–23, 24–31, 32–39, 60–63
DISCIPLINARY CORE IDEA	
LS1.A: Structure and Function Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	**SE/TE:** 4–12, 14–23, 24–31, 32–39
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop and use a model to describe phenomena.	**SE/TE:** 4–12, 14–23, 24–31, 32–39
CROSSCUTTING CONCEPT	
Structure and Function 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.	**SE/TE:** 4–12, 14–23, 24–31, 32–39, 64–67, 130–131

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

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

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 68–71, 72–80, 85, 118–127, 128–131, 132–135
DISCIPLINARY CORE IDEA	
LS1.D: Information Processing 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.	**SE/TE:** 68–71, 72–80, 83, 85, 118–127, 128–131, 132–135
SCIENCE AND ENGINEERING PRACTICE	
Obtaining, Evaluating, and Communicating Information 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.	**SE/TE:** 68–71, 72–80, 118–127, 128–131, 132–135
CROSSCUTTING CONCEPT	
Cause and Effect Cause and effect relationships may be used to predict phenomena in natural systems.	**SE/TE:** 68–71, 72–80, 118–127, 128–131, 132–135, 184–185

Next Generation Science Standards	**Elevate Science ©2019**
Matter and Energy in Organisms and Ecosystems	
Performance Expectation 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.	**SE/TE:** 1, 40–48, 49, 60–61, 214
DISCIPLINARY CORE IDEA	
LS1.C: Organization for Matter and Energy Flow in Organisms 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. **PS3.D: Energy in Chemical Processes and Everyday Life** 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)	**SE/TE:** 40–48, 59, 218, 222, 254, 272
SCIENCE AND ENGINEERING PRACTICE	
Constructing Explanations and Designing Solutions 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. **Connection to Nature of Science** Science knowledge is based upon logical connections between evidence and explanations.	**SE/TE:** 32, 40–48

Next Generation Science Standards	Elevate Science ©2019
CROSSCUTTING CONCEPT	
Energy and Matter Within a natural system, the transfer of energy drives the motion and/or cycling of matter.	**SE/TE:** 40–48, 214
Performance Expectation 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.	**SE/TE:** 1, 40–48, 50–57, 58–59, 60–61, 94
DISCIPLINARY CORE IDEA	
LS1.C: Organization for Matter and Energy Flow in Organisms 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. **PS3.D: Energy in Chemical Processes and Everyday Life** 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)	**SE/TE:** 50–57, 59, 94, 218, 222
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop a model to describe unobservable mechanisms.	**SE/TE:** 50–57
CROSSCUTTING CONCEPT	
Energy and Matter Matter is conserved because atoms are conserved in physical and chemical processes.	**SE/TE:** 50–57

Next Generation Science Standards	Elevate Science ©2019
Performance Expectation 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.	**SE/TE:** 190–193, 194–201, 202–203, 224–225, 228–231, 232–233, 241, 245–252, 278–285
DISCIPLINARY CORE IDEA	
LS2.A: Interdependent Relationships in Ecosystems Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. 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. Growth of organisms and population increases are limited by access to resources.	**SE/TE:** 171–174, 177–179, 190–191, 194–201, 241, 243, 246–252, 265–267
SCIENCE AND ENGINEERING PRACTICE	
Analyzing and Interpreting Data Analyze and interpret data to provide evidence for phenomena.	**SE/TE:** 194–201, 246–252
CROSSCUTTING CONCEPT	
Cause and Effect Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**SE/TE:** 194–201, 246–252

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation MS-LS2-3.	
Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	**SE/TE:** 1, 40–48, 49, 60–61, 190–193, 204–212, 213, 214–222, 224–231, 268–276, 282–285
DISCIPLINARY CORE IDEA	
LS2.B: Cycle of Matter and Energy Transfer in Ecosystems 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.	**SE/TE:** 204–212, 214–222, 224–227, 228–231, 239–241, 242–244, 265
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop a model to describe phenomena.	**SE/TE:** 204–212, 214–222, 268–276
CROSSCUTTING CONCEPT	
Energy and Matter The transfer of energy can be tracked as energy flows through a natural system. **Connection to Nature of Science** Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	**SE/TE:** 130–131, 184–185, 204–212, 214–222

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation MS-LS2-4.	
Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	**SE/TE:** 232–233, 246–252, 254–265, 266–267, 274, 278–285
DISCIPLINARY CORE IDEA	
LS2.C: Ecosystem Dynamics, Functioning, and Resilience 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.	**SE/TE:** 180–181, 202–203, 246–252, 254–265
SCIENCE AND ENGINEERING PRACTICE	
Engaging in Argument from Evidence 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. **Connection to Nature of Science** Science disciplines share common rules of obtaining and evaluating empirical evidence.	**SE/TE:** 246–252, 254–265
CROSSCUTTING CONCEPT	
Stability and Change Small changes in one part of a system might cause large changes in another part.	**SE/TE:** 246–252, 254–265

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

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

Next Generation Science Standards	Elevate Science ©2019
Performance Expectation MS-LS2-5.	
Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	**SE/TE:** 232–235, 254–265, 268–276, 277
DISCIPLINARY CORE IDEA	
LS2.C: Ecosystem Dynamics, Functioning, and Resilience 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. **LS4.D: Biodiversity and Humans** 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) **ETS1.B: Developing Possible Solutions** 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)	**SE/TE:** 94, 254–265, 268–276
SCIENCE AND ENGINEERING PRACTICE	
Engaging in Argument from Evidence Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.	**SE/TE:** 254–265, 268–276

Next Generation Science Standards	Elevate Science ©2019
CROSSCUTTING CONCEPT	
Stability and Change Small changes in one part of a system might cause large changes in another part. **Connections to Engineering, Technology, and Applications of Science** 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. **Connections to Nature of Science** Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.	**SE/TE:** 254–265, 268–276

Next Generation Science Standards	Elevate Science ©2019
Growth, Development, and Reproduction of Organisms	
Performance Expectation 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.	**SE/TE:** 136–137, 150–158, 160–168, 182–185
DISCIPLINARY CORE IDEA	
LS1.B: Growth and Development of Organisms • Animals engage in characteristic behaviors that increase the odds of reproduction. • Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.	**SE/TE:** 140, 150–158, 160–168, 179
SCIENCE AND ENGINEERING PRACTICE	
Engaging in Argument from Evidence 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.	**SE/TE:** 150–158, 160–168
CROSSCUTTING CONCEPT	
Cause and Effect: Mechanism and Prediction Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**SE/TE:** 150–158, 160–168

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation MS-LS1-5.	
Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	**SE/TE:** 136–139, 170–179, 180–181, 182–185, 186–189
DISCIPLINARY CORE IDEA	
LS1.B: Growth and Development of Organisms Genetic factors as well as local conditions affect the growth of the adult plant.	**SE/TE:** 170–179
SCIENCE AND ENGINEERING PRACTICE	
Constructing Explanations and Designing Solutions 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.	**SE/TE:** 170–179
CROSSCUTTING CONCEPT	
Cause and Effect: Mechanism and Prediction Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**SE/TE:** 170–179

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 136–137, 140–149, 154, 158, 182–183
DISCIPLINARY CORE IDEA	
LS3.A: Inheritance of Traits Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. **LS3.B: Variation of Traits** 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. **LS1.B: Growth and Development of Organisms** Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MS-LS3-2)	**SE/TE:** 140–149, 154, 158, 182–183
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop and use a model to describe phenomena.	**SE/TE:** 140–149
CROSSCUTTING CONCEPT	
Cause and Effect Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**SE/TE:** 140–149

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

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 237–238
DISCIPLINARY CORE IDEA	
LS4.C: Adaptation 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.	**SE/TE:** 147–148, 237–238, 252
SCIENCE AND ENGINEERING PRACTICE	
Using Mathematics and Computational Thinking Use mathematical representations to support scientific conclusions and design solutions.	**SE/TE:** 35, 211
CROSSCUTTING CONCEPT	
Cause and Effect Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**SE/TE:** 237–238

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

Next Generation Science Standards	Elevate Science ©2019
Earth's Systems	
Performance Expectation 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.	**SE/TE:** 286–289, 290–299, 300–306, 308–317, 318–324, 326–333, 371, 378, 380–381
DISCIPLINARY CORE IDEA	
ESS3.A: Natural Resources 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.	**SE/TE:** 286–287, 288–289, 290–299, 306, 316–317, 300–306, 307, 308–315, 318–324, 342–343, 345, 352, 367, 378, 380–381
SCIENCE AND ENGINEERING PRACTICE	
Constructing Explanations and Designing Solutions 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.	**SE/TE:** 290–299, 300–306, 308–315, 318–324
CROSSCUTTING CONCEPT	
Cause and Effect: Mechanism and Prediction Cause and effect relationships may be used to predict phenomena in natural or designed systems. **Connections to Engineering, Technology, and Applications of Science** 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.	**SE/TE:** 290–299, 300–306, 308–315, 318–324

Next Generation Science Standards	**Elevate Science ©2019**
Human Impacts	
Performance Expectation MS-ESS3-3.	
Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	**SE/TE:** 138–139, 158, 277, 307, 345
DISCIPLINARY CORE IDEA	
ESS3.C: Human Impacts on Earth Systems 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. 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.	**SE/TE:** 138–139, 261–264, 299–300, 306–307, 338–339, 342, 345, 352
SCIENCE AND ENGINEERING PRACTICE	
Constructing Explanations and Designing Solutions Apply scientific principles to design an object, tool, process or system.	**SE/TE:** 138–139, 158, 277, 307, 345
CROSSCUTTING CONCEPT	
Cause and Effect Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. **Connections to Engineering, Technology, and Applications of Science** 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.	**SE/TE:** 130–131, 184–185

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 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
DISCIPLINARY CORE IDEA	
ESS3.C: Human Impacts on Earth Systems 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.	**SE/TE:** 290–299, 300–306, 308–315, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387
SCIENCE AND ENGINEERING PRACTICE	
Engaging in Argument from Evidence 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.	**SE/TE:** 300–306, 308–315, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387
CROSSCUTTING CONCEPT	
Cause and Effect Cause and effect relationships may be used to predict phenomena in natural or designed systems. **Connections to Engineering, Technology, and Applications of Science** 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. **Connections to Nature of Science** Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.	**SE/TE:** 290–299, 300–306, 308–315, 318–324, 338–345, 346–354, 356–367, 368–378, 380–383, 384–387

Next Generation Science Standards	Elevate Science ©2019
Forces and Interactions	
Performance Expectation MS-PS2-3.	
Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	**SE/TE:** 450–453, 454–457, 472–479, 480–489, 490–495
DISCIPLINARY CORE IDEA	
PS2.B: Types of Interactions 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.	**SE/TE:** 450–453, 454–457, 462, 464–466, 467–471, 472–478, 480–489, 490–495
SCIENCE AND ENGINEERING PRACTICE	
Asking Questions and Defining Problems 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.	**SE/TE:** 6–7, 24, 106, 259, 450–453, 472–478, 480–489, 490–495
CROSSCUTTING CONCEPT	
Cause and Effect: Mechanism and Prediction Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**SE/TE:** 450–453, 472–478, 480–489, 490–495

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 450–453, 454–462, 464–471, 492–495, 496–499
DISCIPLINARY CORE IDEA	
PS2.B: Types of Interactions 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).	**SE/TE:** 450–453, 454–462, 464–471, 492–495, 496–499
SCIENCE AND ENGINEERING PRACTICE	
Planning and Carrying Out Investigations 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.	**SE/TE:** 450–453, 454–462, 464–471, 492–495, 496–499
CROSSCUTTING CONCEPT	
Cause and Effect: Mechanism and Prediction Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**SE/TE:** 450–453, 454–462, 464–471, 492–495, 496–499 **TE:** 450–453, 454–462, 464–471, 492–495, 496–499

Next Generation Science Standards	**Elevate Science ©2019**
Energy	
Performance Expectation 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.	**SE/TE:** 180–181, 221, 352
DISCIPLINARY CORE IDEA	
PS3.A: Definitions of Energy 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.	**SE/TE:** 180–181, 221, 352
SCIENCE AND ENGINEERING PRACTICE	
Analyzing and Interpreting Data Construct and interpret graphical displays of data to identify linear and nonlinear relationships.	**SE/TE:** 143, 165, 178, 180–181, 184–185, 198, 202–203, 241, 260, 266–267, 271, 280–281, 304, 375, 529, 538–539
CROSSCUTTING CONCEPT	
Scale, Proportion, and Quantity 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.	**SE/TE:** 361, 375

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

A Correlation of Elevate Science, Grade 7, ©2019
To the
Next Generation Science Standards, Topic Arrangement

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

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation MS-PS4-2.	
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	**SE/TE:** 388–391, 402–410, 411, 412–421, 422–430, 432–441, 442–449
DISCIPLINARY CORE IDEA	
PS4.B: Electromagnetic Radiation 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. 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. A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. However, because light can travel through space, it cannot be a matter wave, like sound or water waves.	**SE/TE:** 402–410, 413–416, 421, 422–430, 432–441, 444–445
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop and use a model to describe phenomena.	**SE/TE:** 62–63, 402–410, 412–421, 422–430, 432–441, 532
CROSSCUTTING CONCEPT	
Structure and Function Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.	**SE/TE:** 402–410, 412–421, 422–430, 432–441

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

Next Generation Science Standards	Elevate Science ©2019
Engineering Design	
Performance Expectation 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.	**SE/TE:** 64–67, 234–235, 252, 265, 288–289, 330–333, 513
DISCIPLINARY CORE IDEA	
ETS1.A: Defining and Delimiting Engineering Problems 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.	**SE/TE:** 64–67, 234–235, 252, 265, 288–289, 330–333, 513
SCIENCE AND ENGINEERING PRACTICE	
Asking Questions and Defining Problems 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.	**SE/TE:** 64–67, 234–235, 252, 265, 288–289, 330–333, 513

Next Generation Science Standards	Elevate Science ©2019
CROSSCUTTING CONCEPT	
Influence of Science, Engineering, and Technology on Society and the Natural World 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.	**SE/TE:** 330–333, 344, 356, 357–358, 380–381, 532
Performance Expectation MS-ETS1-2.	
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	**SE/TE:** 252, 265, 479, 489, 513, 540–543
DISCIPLINARY CORE IDEA	
ETS1.B: Developing Possible Solutions There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.	**SE/TE:** 252, 265, 479, 489, 513, 540–543
SCIENCE AND ENGINEERING PRACTICE	
Engaging in Argument from Evidence Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.	**SE/TE:** 252, 265, 479, 489, 513, 540–543

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 489, 513
DISCIPLINARY CORE IDEA	
ETS1.B: Developing Possible Solutions • 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.	**SE/TE:** 489, 513
SCIENCE AND ENGINEERING PRACTICE	
Analyzing and Interpreting Data Analyze and interpret data to determine similarities and differences in findings.	**SE/TE:** 489, 513

Next Generation Science Standards	**Elevate Science ©2019**
Performance Expectation 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.	**SE/TE:** 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543
DISCIPLINARY CORE IDEA	
ETS1.B: Developing Possible Solutions 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)	**SE/TE:** 49, 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543
SCIENCE AND ENGINEERING PRACTICE	
Developing and Using Models Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.	**SE/TE:** 64–67, 132–135, 265, 330–333, 415, 424–425, 479, 489, 513, 540–543