A Correlation of

Elevate Science

Life, Earth, & Physical

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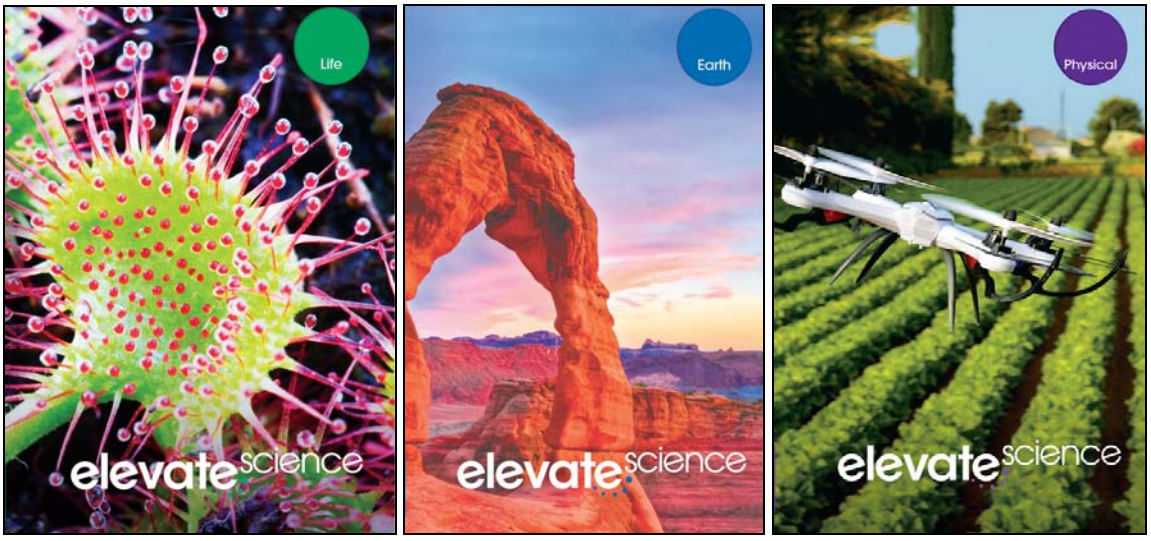

To the

Utah Science and Engineering Education Standards (SEEd)

Grade 6

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To the
Utah SEEd Standards for Grade 6

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To the
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Table of Contents

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A Correlation of Elevate Science ©2019: Life, Earth, and Physical
To the
Utah SEEd Standards for Grade 6

Utah SEEd Standards Grade 6	Elevate Science ©2019 Life, Earth, and Physical
6.1 Structure and Motion Within the Solar System The solar system consists of the Sun, planets, and other objects within Sun's gravitational influence. Gravity is the force of attraction between masses. The Sun-Earth-Moon system provides an opportunity to study interactions between objects in the solar system that influence phenomena observed from Earth. Scientists use data from many sources to determine the scale and properties of objects in our solar system	
6.1.1 Develop and use a model of the Sun-Earth-Moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and Moon, and seasons. Examples of models could be physical, graphical, or conceptual.	**SE/TE:** **Elevate Science Earth:** Design It!: Develop Models, 506 Lunar Motion, 516 Moon Phases, 517 Two Types of Eclipses, 518 Model It!: Solar and Lunar Eclipses, 519 uDemonstrate Lab: Modeling Lunar Phases, 528-531 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 11: Earth-Sun-Moon System** >Lesson 2: Earth's Movement in Space>Interactivity: Patterns and Earth's Rotations in Space; >Interactivity: What Keeps Objects in Motion?; >Video: Earth's Movement in Space >Lesson 3: Phases and Eclipses>Video: Phases and Eclipses; >uInvestigate Lab: How Does the Moon Move?

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To the
Utah SEEd Standards for Grade 6

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6.1.2 Develop and use a model to describe the role of gravity and inertia in orbital motions of objects in our solar system.	**SE/TE:** **Elevate Science Earth:** Math Toolbox: Gravity vs. Distance, 22 Orbital Motion, 511 Evidence-Based Assessment, 582-583 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 11: Earth-Sun-Moon System** >Lesson 1: Movement in Space>uInvestigate Lab: Watching the Skies >Lesson 2: Earth's Movement in Space; >Interactivity: Patterns in Earth's rotation in Space; >Interactivity: What Keeps Objects in Motion? **Topic 12: Solar System and the Universe** >Lesson 1: Solar System Objects>Interactivity: Solar System;>Interactivity: How to Make a Solar System
6.1.3 Use computational thinking to analyze data and determine the scale and properties of objects in the solar system. Examples of scale could include size and distance. Examples of properties could include layers, temperature, surface features, and orbital radius. Data sources could include Earth and space-based instruments such as telescopes and satellites. Types of data could include graphs, data tables, drawings, photographs, and models.	**SE/TE:** **Elevate Science Earth:** Math Toolbox: Temperature and Altitude, 450 Math Toolbox: Converting Units of Distance, 538 Hands-On Lab, 541 The Solar System, 544-545 Case Study: Comparing Solar System Objects, 548-549 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 12: Solar System and the Universe** >Lesson 1: Solar System Objects>Interactivity: Distance Learning; >Virtual Lab: A New Home; >Interactivity: Solar System; >Video: Distances in the Solar System; >Interactivity: How to Make a Solar System>uInvestigate Lab: Layers of the Sun >Lesson 2: Learning about the Universe>Interactivity: Space Exploration

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To the
Utah SEEd Standards for Grade 6

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6.2 Energy Affects Matter Matter and energy are fundamental components of the universe. Matter is anything that has mass and takes up space. Transfer of energy creates change in matter. Changes between general states of matter can occur through the transfer of energy. Density describes how closely matter is packed together. Substances with a higher density have more matter in a given space than substances with a lower density. Changes in heat energy can alter the density of a material. Insulators resist the transfer of heat energy, while conductors easily transfer heat energy. These differences in energy flow can be used to design products to meet the needs of society.	
6.2.1 Develop models to show that molecules are made of different kinds, proportions and quantities of atoms. Emphasize understanding that there are differences between atoms and molecules, and that certain combinations of atoms form specific molecules. Examples of simple molecules could include water (H_2O), atmospheric oxygen (O_2), and carbon dioxide (CO_2).	**SE/TE:** **Elevate Science Physical:** Model It!: Molecules and Atoms, 9 Topic Review and Assess, 36-37 Model It!: Models of an Atom, 339 Lesson 1 Check, 343 Topic Review and Assess, 386-387 **Realize™ Digital Resources:** **Elevate Science Physical:** **Topic 1: Introduction to Matter** >Lesson 1: Describing and Classifying Matter>uInvestigate Lab: Modeling Atoms and Molecules; >Interactivity: Molecules and Extended Structures **Topic 8: Atoms and the Periodic Table** >Lesson 1: Atomic Theory>Interactivity: Build an Atom; >Interactivity: Models of Atoms

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6.2.2 Develop a model to predict the effect of heat energy on states of matter and density. Emphasize the arrangement of particles in states of matter (solid, liquid, or gas) and during phase changes (melting, freezing, condensing, and evaporating).	**SE/TE:** **Elevate Science Physical:** Model It!: Dry Ice, 63 Quest Check-In, 64 Model It!: Developing Models, 71 How Pistons Work, 74 Topic Review and Assess, 11#, 79 Evidence-Based Assessment, 80-81 uDemonstrate Lab: Melting Ice, 82-85 Model It!, 144 **Realize™ Digital Resources:** **Elevate Science Physical:** **Topic 1: Introduction to Matter** >Lesson 2: Measuring Matter>uInvestigate Lab: Observing Physical Properties **Topic 2: Solids, Liquids, and Gases** >Lesson 2: Interactivity: Particle Motion and States of Matter;>Interactivity: States of Matter; >uInvestigate: Mirror, Mirror >Lesson 3: Gas Behavior> Video: Gas Behavior; >Interactivity: Hot Air Balloon Rode
6.2.3 Plan and carry out an investigation to determine the relationship between temperature, the amount of heat transferred, and the change of average particle motion in various types or amounts of matter. Emphasize recording and evaluating data, and communicating the results of the investigation.	**SE/TE:** **Elevate Science Physical:** uDemonstrate Lab Do It Yourself: Melting Ice, 82-85 uDemonstrate Lab: Testing Thermal Conductivity, 170-171 **Realize™ Digital Resources:** **Elevate Science Physical:** **Topic 2: Solids, Liquids, and Gases** >Lesson 1: States of Matter> Virtual Lab: Cooking and States of Matter >Lesson 2: Changes of State> Thermal Energy and Changes of State; >uInvestigate: Mirror, Mirror **Topic 4: Thermal Energy** >Lesson 1: Thermal Energy, Heat, and Temperature>uInvestigate Lab: Temperature and Thermal Energy

Utah SEEd Standards Grade 6	Elevate Science ©2019 Life, Earth, and Physical
6.2.4 Design an object, tool, or process that minimizes or maximizes heat energy transfer. Identify criteria and constraints, develop a prototype for iterative testing, analyze data from testing, and propose modifications for optimizing the design solution. Emphasize demonstrating how the structure of differing materials allows them to function as either conductors or insulators.	**SE/TE:** **Elevate Science Physical:** Quest Kickoff: How can you use solids, liquids, and gases to lift a car?, 44-45 uEngineer It!: From "Ink" to Objects: 3D Printing, 55 Quest Kickoff: How can you keep hot water from cooling down?, 138-139 uEngineer It!: Shockwave to the Future,155 uDemonstrate Lab: Testing Thermal Conductivity, 170-173 **Realize™ Digital Resources:** **Elevate Science Physical:** **Topic 4: Thermal Energy** >Lesson 2: Heat Transfer>Interactivity: Solar Oven Design >Topic Close>uDemonstrate Lab: Testing Thermal Conductivity; >Quest Findings: Reflect on Your Insulating Container

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6.3 Earth's Weather Patterns and Climate All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. Heat energy from the Sun, transmitted by radiation, is the primary source of energy that affects Earth's weather and drives the water cycle. Uneven heating across Earth's surface causes changes in density, which result in convection currents in water and air, creating patterns of atmospheric and oceanic circulation that determine regional and global climates.	
6.3.1 Develop a model to describe how the cycling of water through Earth's systems is driven by energy from the Sun, gravitational forces, and density	**SE/TE:** **Elevate Science Earth:** Model It!: Sea Ice and Climate, 8 Model It!: Identify Patterns, 63 Lesson 2 Check, 64 Quest Check-In, 64 uEngineer It!: Catching Water With a Net, 65 uDemonstrate Lab: Water from Trees, 98-101 Topic Review and Assess, #17, Develop Models, 37 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 2: Weather in the Atmosphere** >Lesson 2: Water in the Atmosphere>Interactivity: Water Cycle; >Video: Water Cycle;>uInvestigate Lab: How Clouds and Fog Form >Lesson 3: Air Masses>Quest Check-In Interactivity: All About Air Masses **Topic 10: Climate** Supporting Content: >Lesson 1: Climate Factors>Inquiry Warm-Up Lab: How does Latitude Affect Climate; >Video: How Ocean Currents Help Regulate Climate

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6.3.2 Investigate the interactions between air masses that cause changes in weather conditions. Collect and analyze weather data to provide evidence for how air masses flow from regions of high pressure to low pressure causing a change in weather. Examples of data collection could include field observations, laboratory experiments, weather maps, or diagrams.	**SE/TE:** **Elevate Science Earth:** Quest Kickoff: How can you prepare for severe weather?, 46-47 Connect It!, 66 Major Air Masses, 67-68 Types of Fronts, 69-70 Model It!: Develop Models, 71 Lesson 3 Check, 73 Quest Check-In, 73 Global Patterns and Local Weather, 77 Math Toolbox: Isobars, 78 Weather Maps, 79 Evidence-Based Assessment, 96-97 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 2: Weather in the Atmosphere** >Lesson 3: Air Masses>Interactivity: When Air Masses Collide; >uInvestigate Lab: Weather Fronts; >Interactivity: Mapping Out the Weather; >Enrichment: Occluded Fronts

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6.3.3 Develop and use a model to show how unequal heating of the Earth's systems causes patterns of atmospheric and oceanic circulation that determine regional climates. Emphasize how warm water and air move from the equator toward the poles. Examples of models could include Utah regional weather patterns such as lake-effect snow and wintertime temperature inversions.	**SE/TE:** **Elevate Science Earth:** Math Toolbox: Isobars, 78 Lesson 4 Check, 80 Model It!: How Thunderstorms Form, 85 Model It!: Earth is Heating Up, 420 Global Wind Belts, 422 Hands-On Lab: uInvestigate, 428 Surface Currents, 428-429 Topic Review and Assess, 436-437 Evidence-Based Assessment, 438-439 uDemonstrate Lab: Not All Heating Is Equal, 440-443 Major Ocean Currents, 451 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 9: Energy in the Atmosphere and Ocean** >Lesson 2: Patterns of Circulation in the Atmosphere>Inquiry Warm-Up Lab: Turn, Turn, Turn; >Interactivity: Where the Wind Blows; >Video: Patterns of Circulation in the Atmosphere; >Interactivity: Winds Across the Globe

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6.3.4 Construct an explanation supported by evidence for the role of the natural greenhouse effect in Earth's energy balance, and how it enables life to exist on Earth. Examples could include comparisons between Earth and other planets such as Venus and Mars.	**SE/TE:** **Elevate Science Earth:** Connect It!, 4 Literacy Connection: Support Author's Claim, 53 Lesson 1 Check, 55, 414 Topic Review and Assess, 94-95, 436-437 Make Meaning, 410 Reflect, 459 **Realize™ Digital Resources:** **Elevate Science Earth:** **Topic 9: Energy in the Atmosphere and Ocean** >Lesson 1: Energy in Earth's Atmosphere>uInvestigate Lab: Heating Earth's Surface; >Enrichment: Energy in the Atmosphere

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6.4 Stability and Change in Ecosystems The study of ecosystems includes the interaction of organisms with each other and with the physical environment. Consistent interactions occur within and between species in various ecosystems as organisms obtain resources, change the environment, and are affected by the environment. This influences the flow of energy through an ecosystem, resulting in system variations. Additionally, ecosystems benefit humans through processes and resources, such as the production of food, water and air purification, and recreation opportunities. Scientists and engineers investigate interactions among organisms and evaluate design solutions to preserve biodiversity and ecosystem resources.	
6.4.1 Analyze data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem. Ask questions to predict how changes in resource availability affects organisms in those ecosystems. Examples could include water, food, and living space in Utah environments.	**SE/TE:** **Elevate Science Life:** Math Toolbox: Graphing Population Changes, 256 Case Study: The Case of the Disappearing Cerulean Warbler, 260-261 Math Toolbox: Predator-Prey Interactions, 299 Lesson 1 Check, 303 Factors Affecting Biodiversity, 316-318 Question It!, 317 Math Toolbox: Room to Roam, 318 Evidence-Based Assessment, 338-339 uDemonstrate Lab: Changes in an Ecosystem, 340-343 **Realize™ Digital Resources:** **Elevate Science Life:** **Topic 5: Ecosystems** >Lesson 1: Living Things and the Environment> Interactivity: An Ecological Mystery; >uInvestigate Lab: Elbow Room **Topic 6: Populations, Communities, and Ecosystems** >Lesson 3: Biodiversity>Interactivity: Biodiversity in the Amazon

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6.4.2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Emphasize consistent interactions in different environments, such as competition, predation, and mutualism.	**SE/TE:** **Elevate Science Life:** Symbiotic Relationships, 300-302 Lesson 1 Check, 303 Case Study: The Dependable Elephant, 324-325 Topic Review and Assess, 336-337 uDemonstrate Lab: Changes in an Ecosystem, 340-343 **Realize™ Digital Resources:** **Elevate Science Life:** **Topic 6: Populations, Communities, and Ecosystems** >Lesson 1: Interactions in Ecosystems>Interactivity: Symbiotic Relationships; >Interactivity: Life on the Reef; >uInvestigate Lab: Competition and Predation; >Enrichment: Analyzing Predator-Prey Interactions
6.4.3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. Emphasize food webs and the role of producers, consumers, and decomposers in various ecosystems. Examples could include Utah ecosystems such as mountains, Great Salt Lake, wetlands, and deserts.	**SE/TE:** **Elevate Science Life:** Food Webs, 266 Model It!: Food Web, 267 Energy Pyramids, 268 Math Toolbox: Relationships in an Energy Pyramid, 269 Lesson 2 Check, 270 Water Cycle, 274-275 Carbon and Oxygen Cycle,276-277 Hands-On Lab: uInvestigate, 275 Lesson 3 Check, 280 Topic Review and Assess, 282-283 uDemonstrate Lab: Last Remains, 286-289 Supporting Services, Figure 3, 330

Utah SEEd Standards Grade 6	Elevate Science ©2019 Life, Earth, and Physical
(Continued)	(Continued) **Realize™ Digital Resources:** **Elevate Science Life:** **Topic 5: Ecosystems** >Lesson 2: Energy Flow in Ecosystems>Interactivity: Energy Roles and Flows; >Interactivity: Living Systems: Living Things in Ecosystems; >uInvestigate Lab: Observing Decomposition; >Quest Check-In Interactivity: Nutrients and Aquatic Organisms >Lesson 3: Cycles of Matter>Interactivity: Cycles of Matter; >uInvestigate Lab: Following Water
6.4.4 Construct an argument supported by evidence that the stability of populations is affected by changes to an ecosystem. Emphasize how changes to living and nonliving components in an ecosystem affect populations in that ecosystem. Examples could include Utah ecosystems such as mountains, Great Salt Lake, wetlands, and deserts.	**SE/TE:** **Elevate Science Life:** Succession, 305-307 Ecosystem Disruptions and Population Survival, 308 Changes to Populations, 308-309 Lesson 2 Check, 310 Evidence-Based Assessment, 338-339 uDemonstrate Lab: Changes in an Ecosystem, 340-343 **Realize™ Digital Resources:** **Elevate Science Life:** **Topic 6: Populations, Communities, and Ecosystems** >Lesson 2: Dynamic and Resilient Ecosystems>Interactivity: Succession in an Ecosystem; >Interactivity: A Butterfly Mystery

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6.4.5 Evaluate competing design solutions for preserving ecosystem services that protect resources and biodiversity based on how well the solutions maintain stability within the ecosystem. Emphasize obtaining, evaluating, and communicating information of differing design solutions. Examples could include policies affecting ecosystems, responding to invasive species or solutions for the preservation of ecosystem resources specific to Utah, such as air and water quality and prevention of soil erosion.	**SE/TE:** **Elevate Science Physical:** Case Study: Earth Power, 156-157 uEngineer It!: Making Water Safe to Drink, 407 **Elevate Science Life:** Quest Kickoff: Should an Animal Crossing Be Constructed in My Community?, 76-77 Human Impact, 318-322 Design It!: Ecological Restoration, 333 uEngineer It!: From Bulldozers to Biomes, 335 **Realize™ Digital Resources:** **Elevate Science Physical:** **Topic 9: Chemical Reactions** >Lesson 1: Mixtures and Solutions>uEngineer It! Interactivity: Water Contaminants and Removal Methods **Elevate Science Life:** **Topic 6: Populations, Communities, and Ecosystems** >Lesson 4: Ecosystem Services>Interactivity: Preventing Soil Erosion >Topic Close>Quest Findings: Reflect on Your Animal Crossing