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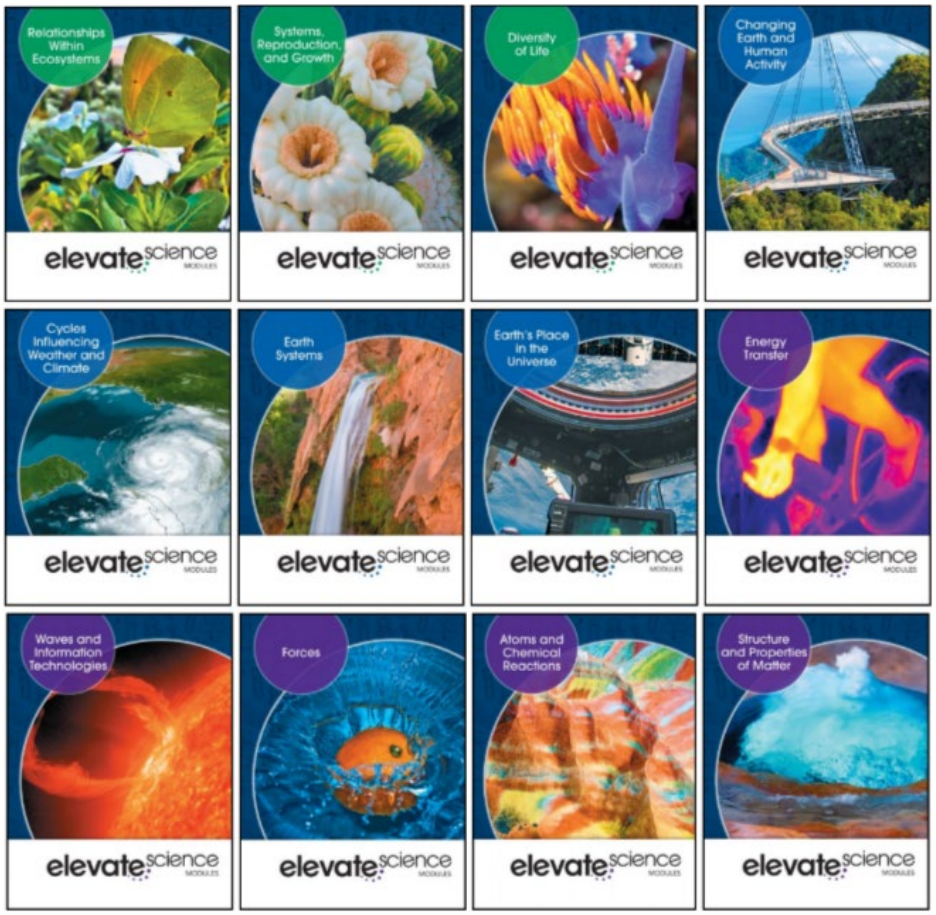

To the

Minnesota
2019 Academic Standards in Science
Grade 8

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

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To the
Minnesota 2019 Academic Standards in Science, Grade 8

Introduction

This document demonstrates how ***Elevate Science ©2019*** meets the Minnesota K-12 Academic Standards in Science, Grades 6-8. Correlation page references are to the Student and Teacher's Editions and cited at the page level. Realize digital courseware is cited using a pathway for each asset (each ">" indicates one click).

Savvas Learning Company LLC 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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To the
Minnesota 2019 Academic Standards in Science, Grade 8

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8P.1.1.1.1 Ask questions about locations of common elements on the periodic table to note patterns in the properties of similarly grouped elements. (P: 1, CC: 1, CI: PS1) Emphasis is on the similar properties within columns of the periodic table. Examples of questions that students may think to ask may include how are the properties of elements in a column similar and different.	**SE/TE:** **Atoms and Chemical Reactions** Question It!, 32 **See also supporting content:** Using the Periodic Table, 19-21 Math Toolbox: Applying the Periodic Table, Questions 1-3, 21 Periods in the Periodic Table, 22-23 Groups in the Periodic Table, 24-26 Lesson 2 Check, Questions 1-4, 27 Reading Check: Support Claims, 31 Metals, 32-33 Nonmetals, 34 Evidence-Based Assessment, 58-59 **Realize™ Digital Resources:** **Atoms and Chemical Reactions** **Atoms and the Periodic Table** >Lesson 2, The Periodic Table>Inquiry Warm-Up Lab: Which Is Easier?; >Video: Major Patterns in the Periodic Table; >Interactivity: Interactive Periodic Table; >Interactivity: The Periodic Table; >uInvestigate Lab: Classifying Elements; >Interactivity: Groups of Elements

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PS: Motion and Stability: Forces and Interactions	
8P.1.1.1.2 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (P: 1, CC: 2, CI: PS2) Examples of data may include the number of turns of wire in a coil, the strength of magnets, and the current through the wire and their effect on the speed of rotation in a simple motor.	**SE/TE:** **Forces** Quest Kickoff: How can you lift an object without making contact?, 54-55 Question it!, 59 Lesson 1 Check, 73 Math Toolbox: Solenoids and Magnetic Fields, 78 Lesson 3 Check, 80 Lesson 3 Quest Check-In, 80 uEngineer It!: Electromagnetism in Action, 81 Question It!: Types of Current, 88 Case Study: The X-57 Maxwell, 92-93 **Realize™ Digital Resources:** **Forces** **Electricity and Magnetism** >Lesson 1, Electric Force>Quest Check-In>Interactivity: Apply Electrical Forces >Lesson 2, Magnetic Force>Quest Check-In Lab: Tracking Levitation >Lesson 3, Electromagnetic Force>uInvestigate Lab: Electric Current and Magnetism; >Interactivity: Electricity and Magnetism; >Interactivity: Electromagnetism; >>Interactivity: Electromagnetic Evidence; >Quest Check-In Lab: Building an Electromagnet; >uEngineer It!

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1.2 Planning and carrying out investigations	
1.2.1 Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and will organize and collect data to provide evidence to support claims the students make about phenomena.	
PS: Matter and its Interactions	
8P.1.2.1.1 Plan and conduct an investigation of changes in pure substances when thermal energy is added or removed and relate those changes to particle motion. (P: 3, CC: 2, CI: PS1) Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs.	**SE/TE:** **Structure and Properties of Matter** Quest Kickoff: How can you use solids, liquids and gases to lift a car?, 44-45 Quest Findings, 81 uDemonstrate Lab: Melting Ice, 82-85 **Realize™ Digital Resources:** **Structure and Properties of Matter** **Solids, Liquids, and Gases** >Topic Launch>Uconnect Lab: Solid, Liquid, or Gas? >Lesson 3, Gas Behavior>Inquiry Warm-Up Lab: How Can Air Keep Chalk from Breaking?; >uInvestigate Lab: Testing Charles's and Boyle's Laws
PS: Motion and Stability: Forces and Interactions	
8P.1.2.1.2 Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (P: 3, CC: 7, CI: PS2) Emphasis is on balanced (Newton's First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton's Second Law), frame of reference, and specification of units.	**SE/TE:** **Forces** uDemonstrate Lab: Stopping on a Dime, 48-51 **Realize™ Digital Resources:** **Forces** **Forces and Motion** >Topic 1>Hands-on Lab: uConnect >Lesson 1, Describing Motion and Force>Inquiry Warm-Up Lab: Is the Force With You?; >uInvestigate Lab: Motion Commotion; >Virtual Lab: Launching a Spacecraft into Motion; > >Lesson 2, Speed, Velocity, and Acceleration>uInvestigate Lab: Walking the Walk; >Lesson 3, Newton's Laws of Motion; >uInvestigate Lab: Newton's Scooters; >Interactivity: Going, Going, Gone!

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8P.1.2.1.3 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. (P: 3, CC: 2, CI: PS2) Examples of this phenomenon may include the interactions of magnets, electrically-charged strips of tape, and electrically-charged pith balls. Examples of investigations may include first-hand experiences or simulations.	**SE/TE:** **Forces** Quest Kick-Off, 54-55 Topic Review and Assess, 96-97 uDemonstrate Lab: Planetary Detective, 98-101 **Realize™ Digital Resources:** **Forces** **Electricity and Magnetism** >Topic Launch>uConnect Lab: Magnetic Poles; >Quest Kickoff> Video: Light as a Feather? >Lesson 1, Electric Force>Inquiry Warm-Up Lab: Uncanny Attractions; >uInvestigate Lab: Detecting Charges; > >Lesson 2, Magnetic Force>uInvestigate Lab: Detecting Fake Coins; >Virtual Lab: Get Your Bearings; >Quest Check-In Lab: Tracking Levitation
PS: Energy	
8P.1.2.1.4 Plan and conduct an investigation to determine how the temperature of a substance is affected by the transfer of energy, the amount of mass, and the type of matter. (P: 3, CC: 2, CI: PS 3) Emphasis is on conceptualizing temperature as the average kinetic energy of a substance's particles. Examples of investigations may include comparing final water temperatures after different masses of ice melt in equal volumes of water with the same initial temperature, and temperature changes of different materials with the same mass as they heat or cool in the environment.	**SE/TE:** **Energy Transfer** Literacy Connection: Conduct Research Projects, 67 uDemonstrate Lab: Testing Thermal Conductivity, 84-87 **Realize™ Digital Resources:** Energy Transfer Thermal Energy >Lesson 1, Thermal Energy, Heat, and Temperature>uInvestigate Lab: Temperature and Thermal Energy >Lesson 2, Heat Transfer>; >uInvestigate Lab: Visualizing Convection Currents >Lesson 3, Heat and Materials>uInvestigate Lab: Comparing How Liquids Cool

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2.0 Looking at data and empirical evidence to understand phenomena or solve problems	
2.1 Analyzing and interpreting data	
2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.	
PS: Matter and its Interactions	
8P.2.1.1.1 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. (P: 4, CC: 1, CI: PS1) Examples of reactions may include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride. Examples of properties may include density, melting point, boiling point, solubility, flammability, and odor.	**SE/TE:** **Introduction to Matter** Quest Kickoff: How can you use science to make special effects?, 2-3 Quest Check-In, 12 Chemical Changes in Matter, 27-29 Math Toolbox: Conservation of Mass, 29 Math Toolbox: Energy in Chemical Reactions, 31 **Atoms and Chemical Reactions** Quest Kickoff: How can you use chemistry to solve a culinary mystery?, 2-3 Connect It!, 78 Model It! Chemical Change, 80 Evidence of Chemical Reactions, 82-83 Energy Graphs for Chemical Reaction, 85 Other Factors, 87 Lesson 2 Check, Questions 1-4, 88 Evidence-Based Assessment, 110-111 **(Continued)** uDemonstrate Lab: Evidence of Chemical Change, 112-115 **Realize™ Digital Resources:** **Atoms and Chemical Reactions** **Chemical Reactions** >Topic Launch>uConnect Lab: What Happens When Chemicals React? >Lesson 2, Chemical Change>Inquiry Warm-Up Lab: Presto Change-O!; >uInvestigate Lab: Changes in a Burning Candle

SE = Student Edition **TE = Teacher's Edition**

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PS: Energy	
8P.2.1.1.2 Construct and interpret graphical displays of data to describe the relationship of kinetic energy to the mass and speed of an object. (P: 4, CC: 3, CI: PS3) Emphasis is on descriptive relationships between kinetic energy and mass separately from kinetic energy and speed. Examples may include riding a bicycle at different speeds, rolling different sizes of rocks downhill, and getting hit by a Waffle ball versus a tennis ball.	**SE/TE:** **Energy Transfer** Math Toolbox: Mass, Speed, and Kinetic Energy, 16 **Realize™ Digital Resources:** **Energy Transfer** **Energy** >Lesson 2, Kinetic Energy and Potential Energy>Interactivity: Interpret Kinetic Energy Graphs>Interactivity: Racing for Kinetic Energy
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2.2.1 Students will be able to use mathematics to represent physical variables and their relationships; compare mathematical expressions to the real world; and engage in computational thinking as they use or develop algorithms to describe the natural or designed worlds.	
PS: Waves and their Applications	
8P.2.2.1.1 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. (P: 5, CC: 1, CI: PS4) Emphasis is on describing waves (standard repeating waves) with both qualitative and quantitative thinking. Not included is electromagnetic waves.	**SE/TE:** **Waves and Information Technologies** Hands-On Lab uConnect, 10 Properties of Waves, 8-9 Math Toolbox: Wave Properties, 10 Lesson 1 Check: Questions, 11 Topic Review and Assess, 54 **Realize™ Digital Resources:** **Waves and Information Technologies** **Waves and Electromagnetic Radiation** >Lesson 1, Wave Properties>Interactivity: Modeling Waves
PS: Energy	
Create a computer program to illustrate the transfer of energy within a system where energy changes form.** (P: 5, CC: 7, CI: PS3) Emphasis of the programming skills is the use of sequences, events and conditionals. Examples of a system may include a roller coaster, a pendulum, an electric water heater, and a solar electric collector.	**SE/TE:** **Energy Transfer** Quest Kickoff: How can you build a complicated machine to do something simple?, 2-3 Quest Check-In , 20, 30 Hands-On Lab, 30 Quest Findings , 45

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3.0 Developing possible explanations of phenomena or designing solutions to engineering problems	
3.1 Developing and using models	
3.1.1 Students will be able to develop, revise, and use models to represent their understanding of phenomena or systems as they develop questions, predictions and/or explanations and communicate ideas to others.	
PS: Matter and its Interactions	
8P.3.1.1.1 Develop models to describe the atomic composition of simple molecules and crystals. (P: 2, CC: 3, CI: PS1) Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules may include ammonia and methane. Examples of crystal structures may include sodium chloride or quartz, pyrite or diamonds. Does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete description of all individual atoms in a complex molecule or crystal structure.	**SE/TE:** **Structure and Properties of Matter** Hands-On Lab, 4 Model It!: Molecules and Atoms, 9 Evidence-Based Assessment, 36-37 **Atoms and Chemical Reactions** Model It! Models of an Atom, 9 Hands-On Lab, 10 Lesson Check, 13 Model It!, 40 Figure 8: Nonpolar and Polar Molecules, 44 Review and Assess, 56 uDemonstrate Lab: Shedding Light on Ions, 60-63 **Realize™ Digital Resources:** **Structure and Properties of Matter** **Introduction to Matter** >Lesson 1,Describing and Classifying Matter>uInvestigate Lab: Modeling Atoms and Molecules; >Interactivity: Molecules and Extended Structures Atoms and Chemical Reactions Atoms and the Periodic Table >Lesson 2, The Periodic Table>Interactivity: Examining Physical Properties of Powders

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8P.3.1.1.2 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (P: 2, CC: 5, CI: PS1) Emphasis is on the law of conservation of matter. Examples of models may include physical models, digital formats, or drawings, which represent atoms. Not included are atomic masses, balancing symbolic equations, or intermolecular forces.	**SE/TE:** **Structure and Properties of Matter** Math Toolbox: Conservation of Mass, 29 **Atoms and Chemical Reactions** Model It!: Formation of Ammonia (Question 3), 92 Math Toolbox: Balanced Equations, 95, 96 **Atoms and Chemical Reactions** Lesson 3 Check, Question 3, 97 Topic 2 Review and Assess, Question 13, 109 Evidence-Based Assessment, Question 3, 110-111 Atoms and Chemical Reactions Chemical Reactions >Lesson 3, Modeling Chemical Reactions>Interactivity: When Wood Burns; >Interactivity: Conservation of Matter; >uInvestigate Lab: Is Matter Conserved?; >Interactivity: Model the Conservation of Mass
PS: Energy	
8P.3.1.1.3 Develop and revise 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. (P: 2, CC: 5, CI: PS3) Emphasis is on relative amounts potential energy and not on calculations of potential energy. Examples of objects within systems interacting at varying distances may include: the Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves, changing the direction/orientation of a magnet, and a balloon with static electrical charge being brought closer to a classmate's hair. Examples of models may include representations, diagrams, pictures, and written descriptions of systems.	**SE/TE:** **Forces** Model It!: Develop Models, 41 Topic Review and Assess, 51 uDemonstrate Lab: Stopping on a Dime, 48-49 **Energy Transfer** Figure 3: Gravitational Potential Energy, 19 Model It!: Conservation in Demolition, 35 Review and Assess, 2 Evidence-Based Assessment, 44-45 uDemonstrate Lab: 3, 2, 1...Liftoff!, 46-49 **Realize™ Digital Resources:** **Energy Transfer** >Lesson 1, Hands-on-Lab: Energy, Magnetism, and Electricity; Interactivity: Roller Coasters and Potential Energy>Hands-On Lab: Build a Chain-Reaction Machine; >Lesson 2, Kinetic Energy and Potential Energy; >Interactivity: Roller Coasters and Potential Energy

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PS: Waves and their Applications	
8P.3.1.1.4 Develop and use a model to qualitatively describe that waves are reflected, absorbed, or transmitted through various materials. (P: 2, CC: 4, CI: PS4) Emphasis is on both light and mechanical waves. Examples of models may include drawings, simulations, a storyboard/diagram and written descriptions.	**SE/TE:** **Waves and Information Technologies** Plan It!: Develop Models, 16, 20, 22, 23 **Waves and Information Technologies** Model It!: Develop Models, 27 Lesson 3 Check, 33 Model It!: Polarizing Glasses, 37 Quest Check-In, 42 Model It!: Fun with Mirrors, 50 Quest Check-In, 53 Evidence-Based Assessment, 56-57 uDemonstrate Lab: Making Waves, 58-61 **Realize™ Digital Resources:** **Waves and Information Technologies** **Waves and Electromagnetic Radiation** >Lesson 2, Wave Interactions> Use Models to Describe Wave Behavior; ; >Interactivity: Reflection, Transmission, and Absorption of Sound Waves; >uInvestigate Lab: Understanding Sound >Lesson 5, Light>Hands-on Lab: uInvestigate, Light Interacting with Matter,

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3.2 Constructing explanations and designing solutions	
3.2.1 Students will be able to apply scientific principles and empirical evidence (primary or secondary) to explain the causes of phenomena or identify weaknesses in explanations developed by the students or others.	
PS: Matter and its Interactions	
8P.3.2.1.1 Construct an explanation based on evidence and scientific principles of a common phenomenon that can be explained by the motions of molecules. (P: 6, CC: 3, CI: PS1) Emphasis of the core idea is that the movement of small particles (atoms or molecules) can explain the behavior of macroscopic phenomena. Examples of phenomena may include expansion of balloons, diffusion of odors, and pressure changes in gases due to heating and cooling.	**SE/TE:** **Structure and Properties of Matter** Lesson Check, 54 Changes of State Between Liquid and Gas, 60-62 Lesson 2 Check, 64 Connect It!, 66 Figure 2, 68 Reading Check, 68, 70 Model It!, 71 Math Toolbox: Graphing Boyle's Law, 72 How Pistons Work, 74 Lesson Check, 75 Case Study: Rising to the Occasion: Charles' Law in the Oven!, 76-77 Topic Review and Assess, 78-79 Evidence-Based Assessment, 80-81 uDemonstrate Lab: Melting Ice, 82-85 **Energy Transfer** Thermal Expansion, 75 Lesson Check, 79 Evidence-Based Assessment, 82-83 **Realize™ Digital Resources:** **Structure and Properties of Matter** **Solids, Liquids, and Gases** >Lesson 1, States of Matter>Interactivity: Particles and States of Matter; >Lesson 2, Change of State>Interactivity: Particle Motion and States of Matter; >Interactivity: States of Matter; >uInvestigate Lab: Mirror, Mirror; >Interactivity: Thermal Energy and Changes of State; >Quest Check-In>Interactivity: Lift Your Car

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(Continued)	**(Continued)** >Lesson 3, Gas Behavior>Inquiry Warm-Up Lab: How Can Air Keep Chalk from Breaking?; >uInvestigate Lab: Testing Charles's and Boyle's Laws; >Interactivity: Gas Laws; >Interactivity: A Hot-Air Balloon Ride; >Quest Check-in Lab
3.2.2 Students will be able to use their understanding of scientific principles and the engineering design process to design solutions that meet established criteria and constraints.*	
8P.3.2.2.1 Construct, test and modify a device that either releases or absorbs thermal energy by chemical processes.* (P: 6, CC: 5, CI: PS1, ETS1) Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of chemical reactions include dissolving ammonium chloride or calcium chloride in water.	**SE/TE:** **Atoms and Chemical Reactions** Quest Kickoff: How can you design and build hot packs and cold packs?, 66-67 Lesson 1 Quest Check-In, 76 Lesson 2 Quest Check-In, 88 It's All Connected: The Art of Chemical Change, 89 Lesson 3 Quest Check-In, 97 Lesson 4 Quest Check-In, 105 Quest Findings, 111 **Realize™ Digital Resources:** **Atoms and Chemical Reactions** **Chemical Reactions** >Topic Launch>Quest Kickoff>Video: Hot and Cold Chemistry >Lesson 1, Mixtures and Solutions>Quest Check-In Lab: Energy Salts >Lesson 2, Chemical Change>Quest Check-In>Interactivity: Design Your Pack >Lesson 3, Modeling Chemical Reactions>Quest Check-In Lab: Pack Building >Lesson 4, Producing Useful Materials>Quest Check-In Lab: Heat It Up or Ice It Down >Topic Close>Quest Findings>Interactivity: Reflect on Your Pack

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PS: Motion and Stability: Forces and Interactions	
8P.3.2.2.2 Design a solution to a problem involving the motion of two colliding objects using Newton's 3rd Law.* (P: 6, CC: 4, CI: PS2, ETS1) Examples of practical problems may include the impact of one-dimensional collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.	**SE/TE:** **Forces** Quest Kickoff: How can you take the crash out of a collision?, 3-Feb Lesson 1 Quest Check-In, 11 Lesson 2 Quest Check-In, 21 Lesson 3 Quest Check-In, 32 uEngineer It!: Generating Energy From Potholes, 33 Lesson 4 Quest Check-In, 42 Quest Findings, 47 uDemonstrate Lab: Stopping on a Dime, 48-51 **Realize™ Digital Resources:** **Forces** **Forces and Motion** >Topic Launch>Quest Kickoff: How can you take the crash out of a collision? >Lesson 1, Describing Motion and Force>Quest Check-In>Interactivity: Define Criteria and Constraints >Lesson 2, Speed, Velocity, and Acceleration>Quest Check-In>Interactivity: Mass, Speed, and Colliding Cars >Lesson 3, Newton's Laws of Motion>uInvestigate Lab: Newton Scooters; >Quest Check-In>Interactivity: Apply Newton's Laws of Motion >Lesson 4, Friction and Gravitational Interactions>Quest Check-In Lab: Bumping Cars, Bumping Solutions >Topic Close>Quest Findings>Interactivity: Reflect on Your Bumper Car Solution

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PS: Energy	
8P.3.2.2. Design, construct, and test a device that either minimizes or maximizes thermal energy transfer.* (P: 6, CC: 5, CI: PS3, ETS1) Emphasis is on using scientific principles to design the device. Examples of devices may include an insulated box, a solar cooker, and a foam cup.	**SE/TE:** **Energy Transfer** uEngineer It!: Prosthetics on the Move, 21 Quest Kickoff: How can you keep hot water from cooling down?, 52-53 Lesson 2 Quest Check-In, 68 uEngineer It!: Shockwave to the Future, 69 Lesson 3 Quest Check-In, 79 uDemonstrate Lab: Testing Thermal Conductivity, 84-87 **Realize™ Digital Resources:** **Thermal Energy** >Lesson 2, Heat Transfer>Quest Check-In>Interactivity: Contain the Heat; >uEngineer It!>Video: Shockwave to the Future >Lesson 3, Heat and Materials>Quest Check-In Lab: Keep the Heat In >Topic Close>Quest Findings>Interactivity: Reflect on Your Insulating Contained

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4.0 Communicating reasons, arguments and ideas to others	
4.1 Arguing from evidence	
4.1.1 Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.	
PS: Motion and Stability: Forces and Interactions	
8P.4.1.1.1 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. (P: 7, CC: 3, CI: PS2) Examples of evidence for arguments may include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system. Not included are Newton's Law of Gravitation or Kepler's Laws.	**SE/TE:** **Forces** Connect It!, 34 Write Arguments, 36 Literacy Connection: Write Arguments, 39 Lesson Check, 42 Lesson 4 Check, Question 4, 42 Evidence-Based Assessment, 46-47 uDemonstrate Lab: Stopping on a Dime, 48-51 Supporting Content: **Realize™ Digital Resources:** **Forces** **Forces and Motion** >Lesson 4, Friction and Gravitational Interactions>Interactivity: Exploring Gravity; >Interactivity: The Pull of the Tides

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8P.4.1.1.2 Compare and evaluate evidence to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (P: 7, CC: 5, CI: PS3) Examples of empirical evidence used in the students' arguments may include the temperature or motion of an object before and after an energy transfer.	**SE/TE:** **Energy Transfer** The Essential Question, 1 Quest Kickoff: How can you build a complicated machine to do something simple?, 2-3 Energy at the Cookout, Figure 4, 28-29 Quest Check-In, 30 Connect It!, 32 Energy Changes Form, 33-35 Lesson 4 Check, 39 Quest Check-In, 39 Case Study: U.S. Energy Consumption, 40-41 Topic Review and Assess, 43 Evidence-Based Assessment, 44-45 uDemonstrate Lab: 3, 2, 1.....Liftoff!, 46-49 Heat Flow, Figure 2, 64-65 Heat Transfer, Figure 3, 66 Question It!, 67 Lesson Check, 68 uEngineer It!: Shockwave to the Future, 69 Case Study: Earth Power, 70-71 Expansion Joints, Figure 3, 75 Plan It!: Materials for Airplanes, 78 Lesson Check, 79 Evidence-Based Assessment, 82-83 **Realize™ Digital Resources:** Energy Transfer Energy >Topic 1>Hands-on-Lab: uConnect; >Lesson 2, Kinetic Energy and Potential Energy>Quest Check-In Lab: Build a Chain-Reaction Machine >Lesson 3, Other Forms of Energy>Interactivity: Using Energy; >Quest Check-In Lab: Test and Evaluate a Chain-Reaction Machine >Lesson 4, Energy Change and Conservation>Quest Check-In Lab: Redesign and Retest a Chain-Reaction Machine

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4.2 Obtaining, evaluating and communicating information	
4.2.1 Students will be able to read and interpret multiple sources to obtain information, evaluate the merit and validity of claims and design solutions, and communicate information, ideas, and evidence in a variety of formats.	
PS: Matter and its Interactions	
8P.4.2.1.1 Gather and evaluate information from multiple sources to describe that synthetic materials come from natural resources and impact society. (P: 8, CC: 6, CI: PS1) Emphasis of the practice is to synthesize information from multiple appropriate sources and assess the credibility, accuracy and possible bias of each publication. Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials may include plastic, medicines, foods, and alternative fuels.	**SE/TE:** **Atoms and Chemical Reactions** Accidental Synthetics, Figure 2, 101 The Impact of Synthetic Materials, 103-104 Lesson Check, 105 Case Study: Is Plastic Really So Fantastic?, 106-107 TE Only: Focus on Mastery: Evaluate Information, 101 Topic Review and Assess, 109 **Realize™ Digital Resources:** **Atoms and Chemical Reactions** **Chemical Reactions** >Lesson 4, Producing Useful Materials>Document: Making Synthetic Materials; >Interactivity: Describe the Impact of Synthetics; >Video: Producing Useful Materials; >uInvestigate Lab: Making Plastic from Starch; >Interactivity: The Impact of Synthetics

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PS: Waves and their Applications	
8P.4.2.1.2 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.** (P: 8, CC: 6, CI: PS4) Emphasis of the practice is on using information to support and clarify claims. Emphasis of the core idea is on understanding that waves (encoded both analog and digitally) can be used for communication purposes. Examples of encoding and transmitting information may include using fiber optic cable to transmit light pulses, radio wave pulses in Wi-Fi devices, and conversion of stored binary patterns to make sound or text on a computer screen.	**SE/TE:** **Waves and Information Technologies** uConnect Lab: Continuous or Discrete?, 62 Quest Kickoff: What is the best way to record sound for my scenario?, 64-65 uEngineer It!: A Life-Saving Mistake, 75 Electromagnetic Signals, 79 Analog and Digital Signals, 80-82 Lesson 2 Check, 85 Quest Check-In, 85 Case Study: Super Ultra High Definition!, 86-87 Math Toolbox: Digital Data Explosion, 91 Roger That!, Figure 3, 92-93 Advantages of Digital Signals, 94-95 Lesson 3 Check, 96 Quest Check-In, 96 Extraordinary Science: Beam Me Up!, 97 Topic 2 Review and Assess, Questions 6-8, 98-99 Evidence-Based Assessment, 100-101 Quest Findings, 101 uDemonstrate Lab: Over and Out, 102-105 **Realize™ Digital Resources:** **Waves and Information Technologies** **Information Technologies** >Lesson 2, Signals>Document: Clocks; >Interactivity: Analog and Digital Signals; >uInvestigate Lab: Constructing a Simple Computer Circuit; >Interactivity: Digitized Images; >Quest Check-In>Interactivity: Analog and Digital Recordings >Lesson 3, Communication and Technology >Interactivity: Signal Reliability