

A Correlation of
Elevate Science
Course 3, ©2019



To the
**Massachusetts
Science and Technology
Engineering Standards
Grade 8**

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Introduction

This document demonstrates how **Elevate Science** ©2019 supports the Massachusetts Science and Technology/Engineering Standards, Grade 8. Correlation page references are to the Student and Teacher's Editions and cited at the page level.

Savvas 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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Massachusetts Science and Technology Engineering Standards, Grade 8		Elevate Science Course 3, ©2019
8.MS-ESS	Earth and Space Sciences	
8.MS-ESS1	Earth's Place in the Universe	
8.MS-ESS1-1b	Develop and use a model of the Earth-Sun system to explain the cyclical pattern of seasons, which includes the Earth's tilt and differential intensity of sunlight on different areas of Earth across the year.	SE/TE: Design It!, 442 The Seasons, Figure 3, 443-444 Evidence- Based Assessment, 462-463
8.MS-ESS1-2	Explain the role of gravity in ocean tides, the orbital motions of planets, their moons, and asteroids in the solar system.	SE/TE: Quest Kickoff: How are tides related to our place in space?, 426-427 Quest Connection, 440 Gravity, 445 Orbital Motion, 447 Quest Check-In, 448 Math Toolbox: High and Low Tides, 456 The Moon and Sun, 456 Spring and Neap Tides, 457
8.MS-ESS2	Earth's Systems	
8.MS-ESS2-1	Use a model to illustrate that energy from the Earth's interior drives convection which cycles Earth's crust leading to melting, crystallization, weathering, and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building, and active volcanic chains.	SE/TE: This standard is addressed in Elevate Science, Course 1, Topic 8, Plate Tectonics, 520-523.

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8.MS-ESS2-5	Interpret basic weather data to identify patterns in air mass interactions and the relationship of those patterns to local weather.	SE/TE: Factors That Affect Precipitation, Figure 4, 388-389 World Climates, 390-391 Lesson 1 Check, 392 Topic 8 Review and Assess, 416
8.MS-ESS2-6	Describe how interactions involving the ocean affect weather and climate on a regional scale, including the influence of the ocean temperature as mediated by energy input from the Sun and energy loss due to evaporation or redistribution via ocean currents.	SE/TE: Global Winds, 356 Effects of Global Wind Belts, 358 Global Wind Patterns, 358-359 Lesson 2 Check, 360 Connect It!, 362 Surface Currents, 363-366 Topic Review and Assess, 372-373 Ocean Currents, 387 Lesson 1 Check, 392
8.MS-ESS3	Earth and Human Activity	
8.MS-ESS3-1	Analyze and interpret data to explain that the Earth’s mineral and fossil fuel resources are unevenly distributed as a result of geologic processes.	SE/TE: This standard is addressed in Elevate Science, Course 2, Topic 6, Distribution of Natural Resources.
8.MS-ESS3-5	Examine and interpret data to describe the role that human activities have played in causing the rise in global temperatures over the past century.	SE/TE: Global to Local: A New Mass Extinction?, 329 The Greenhouse Effect, 346 Greenhouse Effect, 395 Recent Climate Change, 399-402 Lesson 2 Check, 403 uEngineer It!: Changing Climate Change, 415 Evidence-Based Assessment, 418-419

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8.MS-LS	Life Science	
8.MS-LS1	From Molecules to Organisms: Structures and Processes	
8.MS-LS1-5	Construct an argument based on evidence for how environmental and genetic factors influence the growth of organisms.	SE/TE: The Essential Question , 169 Alleles Affect Inheritance, 175-176 Connect It!, 184 Environmental Factors, 210-211 Quest Check-In, 215 Topic 4 Review and Assess, 226-227 Evidence-Based Assessment, 228-229
8.MS-LS1-7	Use informational text to describe that food molecules, including carbohydrates, proteins, and fats, are broken down and rearranged through chemical reactions forming new molecules that support cell growth and/or release of energy.	SE/TE: This standard is addressed in Elevate Science, Course 2, Topic 2, Human Body Systems, Lessons 2 and 3. <ul style="list-style-type: none"> • Systems Interacting • Supplying Energy
8.MS-LS3	Heredity: Inheritance and Variation of Traits	
8.MS-LS3-1	Develop and use a model to describe that structural changes to genes (mutations) may or may not result in changes to proteins, and if there are changes to proteins there may be harmful, beneficial, or neutral changes to traits.	SE/TE: Genetic Mutations, 208 Literacy Connection: Integrate with Visuals, 208 Model It! Mutations and Protein Construction, 209 TE Only: Focus on Mastery, 209 Mutation Effects, 211 Mutations in Reproduction, 212-214 Protein Changes, 214 Lesson 4 Check, 215

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8.MS-LS3-2	Construct an argument based on evidence for how asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. Compare and contrast advantages and disadvantages of asexual and sexual reproduction.	<p>SE/TE: Supporting content: Case Study: Cephalopods, 182-183 This standard is further addressed Elevate Science, Course 2, Topic 3, Reproduction and Growth, Lessons 1-3.</p> <ul style="list-style-type: none"> • Patterns of Reproduction • Animal Behaviors for Reproduction • Factors Influencing Growth
8.MS-LS3-3(MA)	Communicate through writing and in diagrams that chromosomes contain many distinct genes and that each gene holds the instructions for the production of specific proteins, which in turn affects the traits of an individual.	<p>SE/TE: Chromosomes and Genes, 185-187 Model It!, 188 Design It!, 197 Figure 6, 199 Model It! , 201 Lesson 3 Check, 202 Chromosomes Size, 207 Model It! , 209 Lesson 4 Check, 215 Topic 4 Review and Assess, 226-227 Genes and Natural Selection, 254-255</p>
8.MS-LS3-4(MA)	Develop and use a model to show that sexually reproducing organisms have two of each chromosome in their nucleus, and hence two variants (alleles) of each gene that can be the same or different from each other, with one random assortment of each chromosome passed down to offspring from both parents.	<p>SE/TE: Alleles Affect Inheritance, 175-176 Making a Punnett Square, 178-179 Number of Chromosomes, 186 Chromosome Pairs, Figure 3, 187 Quest Check-In, Interactivity, 192 Types of Chromosomes, Figure 2, 206</p>

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8.MS-LS4	Biological Evolution: Unity and Diversity	
8.MS-LS4-4	Use a model to describe the process of natural selection, in which genetic variations of some traits in a population increase some individuals' likelihood of surviving and reproducing in a changing environment. Provide evidence that natural selection occurs over many generations.	SE/TE: How Natural Selection Works, 251 Model It!: Natural Selection in Action, 253 Lesson 2 Check, 256 Variations from Mutations, Figure 3, 261 Model It! Mimicry in Coevolution, 264
8.MS-LS4-5	Synthesize and communicate information about artificial selection, or the ways in which humans have changed the inheritance of desired traits in organisms.	SE/TE: Artificial Selection, 217 Plan It!: Synthesize a New Trait, 218 Gene Therapy in Humans, 220 Cloning Organisms, 221 Controversies of DNA Use, 224 Lesson 2 Check, 225 Topic 4 Review and Assess, 226-227 Evidence-Based Assessment, 228-229 Darwin's Search for a Mechanism, 249-251

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8.MS-PS	Physical Science	
8.MS-PS1	Matter and Its Interactions	
8.MS-PS1-1	Develop a model to describe that (a) atoms combine in a multitude of ways to produce pure substances which make up all of the living and nonliving things that we encounter, (b) atoms form molecules and compounds that range in size from two to thousands of atoms, and (c) mixtures are composed of different proportions of pure substances.	SE/TE: Development of Atomic Theory, 5-9 Model It! Models of an Atom, 9 Bonding, Video, 30-31 uEngineer It! When Particles Collide, 37 Covalent Bonding, 42-43 Properties of Compounds, 45-46 Lesson 4 Check, 47 Types of Mixtures, 69 Plan It! The Right Tool for the Job, 70 Separating Mixtures, 70
8.MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	SE/TE: Quest Kickoff: How can you design and build hot packs and cold packs?, 66 Connect It!, 78 Hands-on Lab, 79 Changing Matter, 79-80 Chemical Change, Model It!, 80 Hands-on Lab, 82 Energy Graphs for Chemical Reactions, 85 Lesson 2 Check, 88 Evidence-Based Assessment, 110-111 uDemonstrate Lab: Evidence of Chemical Change, 112-115
8.MS-PS1-4	Develop a model that describes and predicts changes in particle motion, relative spatial arrangement, temperature, and state of a pure substance when thermal energy is added or removed.	SE/TE: This standard is addressed in Elevate Science, Course 1, Topic 4, Thermal Energy, Lesson 2.

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8.MS-PS1-5	Use a model to explain that atoms are rearranged during a chemical reaction to form new substances with new properties. Explain that the atoms present in the reactants are all present in the products and thus the total number of atoms is conserved.	SE/TE: Building and Breaking Chemical Bonds, 81 Evidence of Chemical Reactions, 82-83 Law of Conservation of Mass , 94-95 Math Toolbox , 95 Topic 2 Review and Assess, 108-109 uDemonstrate Lab: Evidence of Chemical Change, 112-115
8.MS-PS2	Motion and Stability: Forces and Interactions	
8.MS-PS2-1	Develop a model that demonstrates Newton’s third law involving the motion of two colliding objects.	SE/TE: Quest Kick-off: How can you take the crash out of a collision?, 118 Action-Reaction Pairs, Figure 4, 145 Hands-on Lab, 145 Newton's Third Law of Motion, 145-147 Newton’s Laws Together, 147 Question It!: Newton's Third Law of Motion, 147 uEngineer It!: Generating Energy from Potholes, 149 Quest Findings, 163 uDemonstrate Lab: Stopping on a Dime, 164-167
8.MS-PS2-2	Provide evidence that the change in an object’s speed depends on the sum of the forces on the object (the net force) and the mass of the object.	SE/TE: Connect It!, 140 Quest Connection, 140 Newton's Second Law of Motion, 142-143 Newton's Second Law, Figure 3, 143 Calculations with Newton’s Second Law, 144 Math Toolbox: Using Newton's Second Law, 144 Newton's Laws Together, 147 Quest Check-In, 148 Topic 3 Review and Assess, 161 uDemonstrate Lab: Stopping on a Dime, 164-167

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8.MS-ETS	Technology/Engineering	
8.MS-ETS2	Materials, Tools, and Manufacturing	
8.MS-ETS2-4(MA)	Use informational text to illustrate that materials maintain their composition under various kinds of physical processing; however, some material properties may change if a process changes the particulate structure of a material.	SE/TE: Quest Check-In, 47 Hands-On Lab, 79 Model It! , 80 It's All Connected: The Art of Chemical Change, 89
8.MS-ETS2-5(MA)	Present information that illustrates how a product can be created using basic processes in manufacturing systems, including forming, separating, conditioning, assembling, finishing, quality control, and safety. Compare the advantages and disadvantages of human vs. computer control of these processes.	SE/TE: This standard is addressed in Elevate Science, Course 2, Topic 10, Information Technologies.