A Correlation of

Elevate Science
Course 3, ©2019

To the

Arkansas 5-8 Science Standards
Topic Arrangement
Grade 8

A Correlation of Elevate Science, Course 3 ©2019
to the
Arkansas K-12 Science Standards, Grade 8

Introduction

This document demonstrates how ***Elevate Science ©2019*** meets the Arkansas 5-8 Science Standards, Topic Arrangement. 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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Arkansas 6-8 Science Standards Topic Arrangement, Grade 8	**Elevate Science Course 3 ©2019**
GRADE EIGHT	
Waves and Electromagnetic Radiation	
8-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. (Clarification Statement: Emphasis is on describing waves applying both qualitative and quantitative thinking.) (Assessment Boundary: Assessment does not include electromagnetic waves and is limited to standard repeating waves.)	This standard is met in Elevate Science Course 2, Topic 8: Waves and Electromagnetic Radiation.
8-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (Clarification Statement: Emphasis is on both light and mechanical waves. Examples of models could include drawings, simulations, and written descriptions.) (Assessment Boundary: Assessment is limited to qualitative applications pertaining to light and mechanical waves.)	This standard is met in Elevate Science Course 2, Topic 8: Waves and Electromagnetic Radiation.
8-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. (Clarification Statement: Emphasis is on the basic understanding that waves can be used for communication purposes. Examples could 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.) (Assessment Boundary: Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device.)	This standard is met in Elevate Science Course 2, Topic 10: Information Technologies.

Arkansas 6-8 Science Standards Topic Arrangement, Grade 8	**Elevate Science Course 3 ©2019**
Forces and Interactions	
8-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.* (Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.) (Assessment Boundary: Assessment is limited to vertical or horizontal interactions in one dimension.)	**SE/TE:** 149, 164–167
8-PS2-2 Plan 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. (Clarification Statement: 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.) (Assessment Boundary: Assessment is limited to forces and changes in motion in one dimension in an inertial reference frame and to change in one variable at a time. Assessment does not include the use of trigonometry.)	**SE:** 120–127, 128–137, 138–139, 140–148, 164–167 **TE:** 120–127, 128–137, 138–139, 164–167
8-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (Clarification Statement: Examples of devices that use electric and magnetic forces could include electromagnets, electric motors, and generators. Examples of data could include the effect of the number of turns of wire on the strength of an electromagnet, or the effect of increasing the number or strength of magnets on the speed of an electric motor.) (Assessment Boundary: Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.)	This standard is met in Elevate Science Course 2, Topic 9: Electricity and Magnetism.

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8-PS2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. (Clarification Statement: Examples of evidence for arguments could include charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system or data generated from simulations or digital tools.) (Assessment Boundary: Assessment does not include Newton's Law of Gravitation or Kepler's Laws.)	**SE/TE:** 150–158
8-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. (Clarification Statement: Examples of this phenomenon could include the interactions of magnets, electrically-charged strips of tape, and electrically-charged pith balls. Examples of investigations could include first-hand experiences or simulations.) (Assessment Boundary: Assessment is limited to electric and magnetic fields, and is limited to qualitative evidence for the existence of fields.)	This standard is met in Elevate Science Course 2, Topic 9: Electricity and Magnetism.
Energy	
8-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. (**AR** Clarification Statement: Emphasis is on descriptive relationships between kinetic energy and mass separately from kinetic energy and speed. Examples could include riding a bicycle at different speeds, rolling different sized rocks downhill, or getting hit by a plastic ball versus a tennis ball.)	This standard is met in Elevate Science Course 1, Topic 3: Energy.

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8-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. (Clarification Statement: Emphasis is on relative amounts of potential energy, not on calculations of potential energy. Examples of objects within systems interacting at varying distances could include changing the direction/orientation of a magnet, a balloon with static electrical charge being brought closer to a classmate's hair, and the Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves. Examples of models could include representations, diagrams, pictures, or written descriptions of systems.) (Assessment Boundary: Assessment is limited to two objects and electric, magnetic, and gravitational interactions.)	**SE/TE:** 150–158

Arkansas 6-8 Science Standards Topic Arrangement, Grade 8	**Elevate Science Course 3 ©2019**
Space Systems	
8-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. (Clarification Statement: Examples of models can be physical, graphical, or conceptual.)	**SE/TE:** 428–437, 438–439, 440–448, 450–458, 460–461, 464–467
8-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as students' school or state).) (Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.)	**SE/TE:** 472–483, 496–505, 506–514, 518–523
8-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system. (Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, or spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust or atmosphere), surface features (such as volcanoes), or orbital radius. Examples of data include statistical information, drawings and photographs, or models.) (Assessment Boundary: Assessment does not include recalling facts about properties of the planets or other solar system bodies.)	**SE/TE:** 472–483, 484–485, 486–494

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History of Earth	
8-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. (Clarification Statement: Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history. Examples of Earth's major events could range from being very recent (such as the last Ice Age or the earliest fossils of Homo sapiens) to very old (such as the formation of Earth or the earliest evidence of life). Examples can include the formation of mountain chains or ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.) (Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them.)	**SE/TE:** 298–299, 302–309, 310–311, 312–318, 320–328
Growth, Development, and Reproduction of Organisms	
8-LS3-1 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. (Clarification Statement: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.) (Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.)	**SE/TE:** 182–183, 194–202, 204–215, 281–285

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8-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. (Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, or gene therapy); or, on the impacts these technologies have on society as well as the technologies leading to these scientific discoveries.)	**SE/TE:** 216–225, 248–256
Natural Selection and Adaptations	
8-LS4-1 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. (Clarification Statement: Emphasis is on finding patterns of change in the level of complexity of anatomical structures in organisms or the chronological order of fossil appearance in the rock layers.) (Assessment Boundary: Assessment does not include the names of individual species or geological eras in the fossil record.)	**SE/TE:** 266–279, 302, 304–306, 318, 328, 330–331, 334–337
8-LS4-2 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. (Clarification Statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarities or differences of the gross appearance of anatomical structures.)	**SE/TE:** 242, 266–279, 280–288, 310–311, 334–337

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8-LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. (Clarification Statement: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.) (Assessment Boundary: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.)	**SE/TE:** 266–277
8-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:** 182–183, 238–247, 248–256, 258–265
8-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. (Clarification Statement: Emphasis is on using mathematical models, probability statements, or proportional reasoning to support explanations of trends in changes to populations over time.) (Assessment Boundary: Assessment does not include Hardy Weinberg calculations.)	**SE/TE:** 248–256, 258–265, 266–277, 280–288

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Engineering, Technology, and Applications of Science	
8-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. (AR Clarification: Examples could include designing methods for monitoring human impacts and designing solutions to environmental challenges (such as water quality testing, etc.).	**SE/TE:** 66–67, 84, 85, 118–119, 382–383, 495, 533
8-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. (**AR** Clarification Statement: Students could investigate ways that humans consume resources and design a solution to a problem created by increased human population and consumption.)	**SE/TE:** 66–67, 84, 85, 106–107, 118–119, 334–337, 340–341, 382–383, 412, 495
8-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. (**AR** Clarification Statement: Examples could include analyzing data collected from areas such as GMO crops, gene therapy, selective breeding, etc. to determine the success of the technology used.)	**SE/TE:** 66–67, 84, 85, 97, 112–115, 164–167, 225, 230–233, 533, 535
8-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. (**AR** Clarification Statement: Examples could include exploring the sources of synthetic materials such as plastics, toxins, fertilizers, etc. and their impacts on the society and the environment.)	**SE/TE:** 66–67, 84, 85, 112–115, 118–119, 164–167, 334–337