

STEVE TRASH SCIENCE

SEASON TWO

Correlation Guide for Teachers

Welcome to Steve Trash Science! This correlation guide will assist you as you plan your science lessons for elementary students. Please remember that the design of the Alabama COS Science requires multiple lessons to attain mastery of each standard. Our videos will help your students build the content necessary to master the standards.

The Scientific and Engineering Practices (SEPs), Crosscutting Concepts (CCCs) and Disciplinary Core Ideas (DCIs) are applicable in all grades and disciplines of science. Steve Trash Science videos are useful in all grade levels!

We hope you find the videos and this correlation guide useful.

(Unless otherwise noted, this correlation guide corresponds to the Alabama Course of Study: Science, 2015)

Episode Theme	COS Standard Addressed	SEPs	CCCs	DCIs
Artificial Intelligence	As of June 2022, Alabama has not incorporated Artificial Intelligence into its course of study. This episode supports the work of AI4K12, an initiative which is developing national guidelines for AI education for K-12.	<ul style="list-style-type: none">● Asking questions (for science) and defining problems (for engineering)● Developing and using models● Planning and carrying out investigations● Analyzing and interpreting data● Obtaining, evaluating, and communicating information	<ul style="list-style-type: none">● Cause and Effect● Structure and function	<ul style="list-style-type: none">● Engineering, Technology, and Applications of Science<ul style="list-style-type: none">○ Engineering Design○ Links Among Engineering, Technology, Science, and Society

	<p>2018 Alabama Course of Study: Digital Literacy and Computer Science</p> <p>GRADE 6</p> <p>2. Define a process as a function. (Computational Thinker: Abstraction)</p> <p>7. Describe how automation works to increase efficiency. (Computational Thinker: Programming and Development)</p> <p>23. Discuss how digital devices may be used to collect, analyze, and present information. (Computing Analyst: Systems)</p> <p>28. Define assistive technologies and state reasons they may be used. (Innovative Designer: Human/Computer Partnerships)</p> <p>29. Define artificial intelligence and identify examples of artificial intelligence in the community. (Innovative Designer: Human/Computer Partnerships)</p> <p>GRADE 7</p> <p>2. Create complex pseudocode using conditionals and Boolean statements. (Computational Thinker: Algorithms)</p> <p>27. Identify data needed to create a model or simulation of a given event. (Computing Analyst: Modeling and Simulation)</p> <p>29. Compare and contrast human intelligence and artificial intelligence. (Innovative Designer: Human/Computer Partnerships)</p> <p>GRADE 8</p> <p>Describe how algorithmic processes and automation increase efficiency. (Computational Thinker: Programming and Development)</p> <p>28. Develop a logical argument for and against artificial intelligence. (Innovative Designer: Design Thinking)</p>			
Atmosphere	<p>Grade 5</p> <p>16. Use a model to represent how any two systems, specifically the atmosphere, biosphere, geosphere, and/or hydrosphere, interact and support life (e.g., influence of the ocean on ecosystems, landform shape, and climate; influence of the atmosphere on landforms and ecosystems through weather and climate, influence of mountain ranges on winds and clouds in the atmosphere).</p>	<ul style="list-style-type: none"> ● Asking Questions and Defining Problems ● Developing and Using Models ● Constructing Explanations (Science) and Designing Solutions (Engineering) 	<ul style="list-style-type: none"> ● Patterns ● Cause and Effect ● Systems and Models ● Stability and Change 	<ul style="list-style-type: none"> ● Earth and Space Science <ul style="list-style-type: none"> ○ Earth’s Systems ○ Earth and Human Activity
Bar and Line Graphs	<p>Grade 2 (Mathematics COS 2019):</p> <p>16. Create a picture graph and bar graph to represent data with up to four categories.</p>			

<p>(Note that this episode is correlated to the AL Math COS.)</p>	<p>Grade 3 (Mathematics COS 2019) 16. For a given or collected set of data, create a scaled (one-to-many) picture graph and scaled bar graph to represent a data set with several categories.</p>			
<p>Electrical Circuits</p>	<p>Grade 4 2. Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents. b. Demonstrate that different objects can absorb, reflect, and/or conduct energy. c. Demonstrate that electric circuits require a complete loop through which an electric current can pass.</p>	<ul style="list-style-type: none"> ● Asking Questions and Defining Problems ● Developing and Using Models ● Planning and Carrying Out Investigations 	<ul style="list-style-type: none"> ● Cause and Effect ● Systems and Models ● Energy and Matter 	<ul style="list-style-type: none"> ● Physical Sciences: Energy ● Engineering, Technology, and Applications of Science <ul style="list-style-type: none"> ○ Links Among Engineering, Technology, Science, and Society
<p>Engineering Basics</p>	<p>The Engineering Design Process (EDP) can be used in all grade levels. Students can apply the EDP to problem solving in all disciplines of science. This episode corresponds to all the standards marked with an asterisk.</p> <p>The content in this episode additionally supports: Grade 8 Motion and Stability: Forces and Interactions 8. Use Newton’s first law to demonstrate and explain that an object is either at rest or moves at a constant velocity unless acted upon by an external force.</p>	<ul style="list-style-type: none"> ● Asking questions (for science) and defining problems (for engineering) ● Developing and using models ● Planning and carrying out investigations ● Analyzing and interpreting data ● Constructing explanations (for science) and designing solutions (for engineering) 	<ul style="list-style-type: none"> ● Cause and Effect ● Structure and Function 	<ul style="list-style-type: none"> ● Engineering, Technology, and Applications of Science <ul style="list-style-type: none"> ○ Engineering Design ○ Links Among Engineering, Technology, Science, and Society

	<p>9. Use Newton's second law to demonstrate and explain how changes in an object's motion depend on the sum of the external forces on the object and the mass of the object.</p> <p>10. Construct an argument from evidence explaining that fields exist between objects exerting forces on each other even when the objects are not in contact.</p>			
Food Webs	<p>Grade 5</p> <p>11. Create a model to illustrate the transfer of matter among producers; consumers, including scavengers and decomposers; and the environment.</p>	<ul style="list-style-type: none"> • Asking questions and defining problems • Developing and using models 	<ul style="list-style-type: none"> • Cause and Effect • Energy and Matter 	<ul style="list-style-type: none"> • Life Sciences <ul style="list-style-type: none"> o From molecules to organisms: Structures and Processes
Forces	<p>Grade 3</p> <p>1. Plan and carry out an experiment to determine the effects of balanced and unbalanced forces on the motion of an object using one variable at a time, including number, size, direction, speed, position, friction, or air resistance (e.g., balanced forces pushing from both sides on an object, such as a box, producing no motion; unbalanced force on one side of an object, such as a ball, producing motion), and communicate these findings graphically.</p> <p>3. Explore objects that can be manipulated in order to determine cause-and-effect relationships (e.g., distance between objects affecting strength of a force,</p>	<ul style="list-style-type: none"> • Asking questions (for science) and defining problems (for engineering) • Obtaining, evaluating, and communicating information 	<ul style="list-style-type: none"> • Cause and Effect 	<ul style="list-style-type: none"> • Physical Sciences <ul style="list-style-type: none"> o Motion and Stability: Forces and Interactions

	<p>orientation of magnets affecting direction of a magnetic force) of electric interactions between two objects not in contact with one another (e.g., force on hair from an electrically charged balloon, electrical forces between a charged rod and pieces of paper) or magnetic interactions between two objects not in contact with one another (e.g., force between two permanent magnets or between an electromagnet and steel paperclips, force exerted by one magnet versus the force exerted by two magnets).</p> <p>4. Apply scientific ideas about magnets to solve a problem through an engineering design project (e.g., constructing a latch to keep a door shut, creating a device to keep two moving objects from touching each other such as a maglev system).</p>			
Fossils	<p>Grade 3 9. Analyze and interpret data from fossils (e.g., type, size, distribution) to provide evidence of organisms and the environments in which they lived long ago (e.g., marine fossils on dry land, tropical plant fossils in arctic areas, fossils of extinct organisms in any environment).</p>	<ul style="list-style-type: none"> • Asking questions (science) and defining problems (engineering) • Developing and using models • Constructing Explanations (science) and designing solutions (engineering) 	<ul style="list-style-type: none"> • Cause and Effect • Stability and Change 	<ul style="list-style-type: none"> • Life Sciences: Unity and Diversity
Fractions	<p>(Mathematics COS 2019) Grade 1, Standard 23 Grade 2, Standard 27 Grade 3, Standards 13 and 15</p>			

	Grade 4, Standards 14 and 15 Grade 5, Standard 11 (Standards not written out for sake of brevity.)			
Hydrosphere	Grade 5 15. Identify the distribution of freshwater and salt water on Earth (e.g. oceans, lakes, rivers, glaciers, ground water, polar ice caps) and construct a graphical representation depicting the amounts and percentages in different reservoirs.	<ul style="list-style-type: none"> • Asking Questions and Defining Problems • Constructing Explanations and Designing Solutions 	<ul style="list-style-type: none"> • Patterns • Scale, Proportion, and Quantity • Cause and Effect 	<ul style="list-style-type: none"> • Earth and Space Science <ul style="list-style-type: none"> o Earth's Systems o Earth and Human Activity
Landforms	Grade 4 14. Explore information to support the claim that landforms are the result of a combination of constructive forces, including crustal deformation, volcanic eruptions, and sediment deposition as well as a result of destructive forces, including erosion and weathering.	<ul style="list-style-type: none"> • Asking questions (science) and defining problems (engineering) • Developing and using models • Constructing Explanations (science) and designing solutions (engineering) 	<ul style="list-style-type: none"> • Cause and Effect • Energy and Matter • Stability and Change 	<ul style="list-style-type: none"> • Earth and Space Sciences: Earth's Systems
Litter and Trash	Grade 3 11. Construct an argument from evidence to explain the likelihood of an organism's ability to survive when compared to the resources in a certain habitat (e.g., freshwater organisms survive well, less well, or not at all in saltwater; desert organisms survive well, less well, or not at all in woodlands).	<ul style="list-style-type: none"> • Asking Questions and Defining Problems • Developing and Using Models 	<ul style="list-style-type: none"> • Cause and Effect • Scale, Proportion, and Quantity • Systems and System Models 	<ul style="list-style-type: none"> • Earth and Space Science <ul style="list-style-type: none"> o Earth's Systems o Earth and Human Activity

	<p>b. Create models that illustrate how organisms and their habitats make up a system in which the parts depend on each other.</p> <p>Grade 5 8. Use a model to represent how any two systems, specifically the atmosphere, biosphere, geosphere, and/or hydrosphere, interact and support life (e.g., influence of the ocean on ecosystems, landform shape, and climate; influence of the atmosphere on landforms and ecosystems through weather and climate; influence of mountain ranges on winds and clouds in the atmosphere).</p> <p>Earth and Human Activity 10. Collect and organize scientific ideas that individuals and communities can use to protect Earth’s natural resources and its environment (e.g., terracing land to prevent soil erosion, utilizing no-till farming to improve soil fertility, regulating emissions from factories and automobiles to reduce air pollution, recycling to reduce overuse of landfill areas).</p>			
<p>Measurement (Note that this episode is</p>	<p>Grade 2 (Mathematics COS 2019) 17. Measure the length of an object by selecting and using standard units of measurement shown on rulers, yardsticks, meter sticks, or measuring tapes.</p>			

<p>correlated to the AL Math COS.)</p>	<p>Grade 4 21. Select and use an appropriate unit of measurement for a given attribute (length, mass, liquid volume, time) within one system of units: metric - km, m, cm; kg, g, l, ml; customary - lb, oz; time - hr, min, sec.</p>			
<p>The Muscular System</p>	<p>Grade 4 9. Examine evidence to support an argument that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, colored petals, xylem, phloem) and animals (e.g., heart, stomach, lung, brain, skin) function to support survival, growth, behavior, and reproduction.</p> <p>10. Obtain and communicate information explaining that humans have systems that interact with one another for digestion, respiration, circulation, excretion, movement, control, coordination, and protection from disease.</p>	<ul style="list-style-type: none"> • Asking questions (science) and defining problems (engineering) • Developing and using models 	<ul style="list-style-type: none"> • Cause and Effect • Systems and System Models • Structure and Function 	<ul style="list-style-type: none"> • Physical Sciences: Motion and Stability: Forces and Interactions • Life Sciences: From Molecules to Organisms: Structures and Processes
<p>Photosynthesis</p>	<p>Grade 5 Ecosystems: Interactions, Energy, and Dynamics 8. Defend the position that plants obtain materials needed for growth primarily from air and water.</p> <p>9. Construct an illustration to explain how plants use light energy to convert carbon dioxide and water into a storable fuel, carbohydrates, and a waste product, oxygen, during photosynthesis.</p>	<ul style="list-style-type: none"> • Asking questions (science) and defining problems (engineering) • Constructing Explanations (science) and designing solutions (engineering) 	<ul style="list-style-type: none"> • Cause and Effect • Systems and System Models • Energy and Matter • Structure and Function 	<ul style="list-style-type: none"> • Life Sciences: From Molecules to Organisms: Structures and Processes

	11. Create a model to illustrate the transfer of matter among producers; consumers, including scavengers and decomposers; and the environment.			
Properties of Matter	<p>Grade 2</p> <p>1. Conduct an investigation to describe and classify various substances according to physical properties (e.g., milk being a liquid, not clear in color, assuming shape of its container, mixing with water; mineral oil being a liquid, clear in color, taking shape of its container, floating in water; a brick being a solid, not clear in color, rough in texture, not taking the shape of its container, sinking in water).</p> <p>2. Collect and evaluate data to determine appropriate uses of materials based on their properties (e.g., strength, flexibility, hardness, texture, absorbency).</p> <p>Grade 5</p> <p>3. Examine matter through observations and measurements to identify materials (e.g., powders, metals, minerals, liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, density).</p>	<ul style="list-style-type: none"> • Asking questions (science) and defining problems (engineering) • Developing and using models 	<ul style="list-style-type: none"> • Cause and Effect • Systems and System Models • Structure and Function 	<ul style="list-style-type: none"> • Physical Sciences <ul style="list-style-type: none"> ○ Matter and Its Interactions
Simple Machines	Note: Although the study of simple machines is not included in the 2015 COS Science as a topic per se, understanding how simple machines work builds toward	<ul style="list-style-type: none"> • Asking Questions and Defining Problems 	<ul style="list-style-type: none"> • Patterns • Cause and Effect • Energy and Matter 	<ul style="list-style-type: none"> • Physical Science <ul style="list-style-type: none"> ○ Motion and Stability: Forces and Interactions

	<p>the mastery of the standards below, and towards all aspects of engineering at every grade level.</p> <p>Grade 3</p> <p>1. Plan and carry out an experiment to determine the effects of balanced and unbalanced forces on the motion of an object using one variable at a time, including number, size, direction, speed, position, friction, or air resistance (e.g., balanced forces pushing from both sides on an object, such as a box, producing no motion; unbalanced force on one side of an object, such as a ball, producing motion), and communicate these findings graphically.</p> <p>2. Investigate, measure, and communicate in a graphical format how an observed pattern of motion (e.g., a child swinging in a swing, a ball rolling back and forth in a bowl, two children teetering on a see-saw, a model vehicle rolling down a ramp of varying heights, a pendulum swinging) can be used to predict the future motion of an object.</p>	<ul style="list-style-type: none"> ● Developing and Using Models 		<ul style="list-style-type: none"> o Energy ● Engineering, Technology, and Applications of Science
<p>Skeletal System</p>	<p>Grade 4</p> <p>9. Examine evidence to support an argument that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, colored petals, xylem, phloem) and animals (e.g., heart, stomach, lung, brain, skin) function to support</p>	<ul style="list-style-type: none"> ● Developing and using models ● Using mathematics and computational thinking 	<ul style="list-style-type: none"> ● Cause and Effect ● Scale, Proportion, and Quantity ● Systems and System Models ● Structure and Function 	<ul style="list-style-type: none"> ● Physical Sciences: Motion and Stability: Forces and Interactions ● Life Sciences: From to Organisms: Structures and

	<p>survival, growth, behavior, and reproduction.</p> <p>10. Obtain and communicate information explaining that humans have systems that interact with one another for digestion, respiration, circulation, excretion, movement, control, coordination, and protection from disease.</p>	<ul style="list-style-type: none"> ● Engaging in argument from evidence 		<p>Processes (throughout)</p>
<p>Telling Time (Note that this episode is correlated to the AL Math COS.)</p>	<p>(Mathematics COS 2019) Grade 3 18. Tell and write time to the nearest minute; measure time intervals in minutes (within 90 minutes). a. Solve real-world problems involving addition and subtraction of time intervals in minutes by representing the problem on a number line diagram. (Note that this video can also be used to support grades 1 and 2 with telling time.)</p>			
<p>What is Science?</p>	<p>This episode covers the “nature of science,” which is applicable in all grades and all science disciplines.</p>	<p>All</p>	<p>All</p>	<p>All</p>