

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science
Inquiry Strand Grade 7**

2010 MS Framework G7 - Inquiry	2018 MS CCRS for Science - all grades and courses
Competency 1. Design and conduct a scientific investigation utilizing appropriate process skills and technology.	All Inquiry skills will be taught in the appropriate performance objectives in the new standards. Students will use various Science and Engineering Practices (SEPs) to learn the content. All science skills should be included as needed.
1a. Design, conduct, and draw conclusions from an investigation that includes using experimental controls.	
1b. Discriminate among observations, inferences, and predictions.	
1c. Collect and display data using simple tools and resources to compare information (using standard, metric, and non-standard measurement). <ul style="list-style-type: none"> • Tools (e.g., English rulers [to the nearest one-sixteenth of an inch], metric rulers [to the nearest millimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges, barometers, hygrometers, telescopes, compasses, spring scales, pH indicators, stopwatches) • Types of data (e.g., linear measures, mass, volume, temperature, area, perimeter) • Resources (e.g., Internet, electronic encyclopedias, journals, community resources, etc.) 	
1d. Organize data in tables and graphs and analyze data to construct explanations and draw conclusions.	
1e. Communicate results of scientific procedures and explanations through a variety of written and graphic methods.	
1f. Explain how science and technology are reciprocal.	
1g. Develop a logical argument to explain why scientists often review and ask questions about the results of other scientists' work.	
1h. Make relationships between evidence and explanations.	

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science
Life Science Grade 7**

2010 MS Framework G7 – Life Science	2018 MS CCRS for Science G7 - Life Science
<p>Competency 3. Distinguish the characteristics of living things and explain the interdependency between form and function using the systems of the human organism to illustrate this relationship.</p>	<p align="center">Standard statements are in bold font below.</p>
<p>3a. Assess how an organism’s chances for survival are influenced by adaptations to its environment.</p> <ul style="list-style-type: none"> • The importance of fungi as decomposers • Major characteristics of land biomes (e.g., tropical rainforests, temperate rainforests, deserts, tundra, coniferous forests/taiga, and deciduous forests); • Adaptations of various plants to survive and reproduce in different biomes) 	<p><i>Moved to Grade 5 (L.5.3B) and Grade 6 (L.6.4)</i></p>
<p>3b. Classify the organization and development of living things to include prokaryotic (e.g., bacteria) and eukaryotic organisms (e.g., protozoa, certain fungi, multicellular animals and plants).</p>	<p><i>Moved to Grade 6 (L.6.1)</i></p>
<p>3c. Evaluate how health care technology has improved the quality of human life (e.g., computerized tomography [CT], artificial organs, magnetic resonance imaging [MRI], ultrasound).</p>	<p><i>Similar topics are included in Human Anatomy & Physiology</i></p>
<p>3d. Compare and contrast reproduction in terms of the passing of genetic information (DNA) from parent to offspring.</p> <ul style="list-style-type: none"> • Sexual and asexual reproduction • Reproduction that accounts for evolutionary adaptability of species • Mitosis and meiosis • Historical contributions and significance of discoveries of Gregor Mendel and Thomas Hunt Morgan as related to genetics) 	<p><i>Expanded and moved to Grade 8 (L.8.2A and L.8.2B)</i></p>

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2010 MS Framework G7 – Life Science	2018 MS CCRS for Science G7 - Life Science
<p>3e. Compare and contrast how organisms obtain and utilize matter and energy.</p> <ul style="list-style-type: none">• How organisms use resources, grow, reproduce, maintain stable internal conditions (homeostasis) and recycle waste• How plants break down sugar to release stored chemical energy through respiration)	<p>L.7.3 Students will demonstrate an understanding of the importance that matter cycles between living and nonliving parts of the ecosystem to sustain life on Earth.</p> <p>L.7.3.1 Analyze diagrams to provide evidence of the importance of the cycling of water, oxygen, carbon, and nitrogen through ecosystems to organisms.</p> <p>L.7.3.2 Analyze and interpret data to explain how the processes of photosynthesis, and cellular respiration (aerobic and anaerobic) work together to meet the needs of plants and animals.</p> <p>L.7.3.3 Use models to describe how food molecules (carbohydrates, lipids, proteins) are processed through chemical reactions using oxygen (aerobic) to form new molecules.</p> <p>L.7.3.4 Explain how disruptions in cycles (e.g., water, oxygen, carbon, and nitrogen) affect biodiversity and ecosystem services (e.g., water, food, and medications) which are needed to sustain human life on Earth.</p> <p>L.7.3.5 Design solutions for sustaining the health of ecosystems to maintain biodiversity and the resources needed by humans for survival (e.g., water purification, nutrient recycling, prevention of soil erosion, and prevention or management of invasive species).</p>

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Physical Science Grade 7**

2010 MS Framework G7 – Physical Science	2018 MS CCRS for Science G7 – Physical Science
<p>Competency 2. Develop an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects.</p>	<p>Standard statements are in bold font below.</p>
<p>2a. Identify patterns (e.g., atomic mass, increasing atomic numbers) and common characteristics (metals, nonmetals, gasses) of elements found in the periodic table of elements.</p>	<p>P.7.5C Students will demonstrate an understanding of the proper use of the periodic table to predict and identify elemental properties and how elements interact.</p> <p>P.7.5C.1 Develop and use models that explain the structure of an atom.</p> <p>P.7.5C.2 Use informational text to sequence the major discoveries leading to the current atomic model.</p> <p>P.7.5C.3 Collect, organize, and interpret data from investigations to identify and analyze the relationships between the physical and chemical properties of elements, atoms, molecules, compounds, solutions, and mixtures.</p> <p>P.7.5C.4 Predict the properties and interactions of elements using the periodic table (metals, non-metals, reactivity, and conductors).</p> <p>P.7.5C.5 Describe concepts used to construct chemical formulas (e.g. CH₄, H₂O) to determine the number of atoms in a chemical formula.</p> <p>P.7.5C.6 Using the periodic table, make predictions to explain how bonds (ionic and covalent) form between groups of elements (e.g., oxygen gas, ozone, water, table salt, and methane).</p>
<p>2b. Categorize types of chemical changes, including synthesis and decomposition reactions, and classify acids and bases using the pH scale and indicators</p>	<p>P.7.5D Students will demonstrate an understanding of chemical formulas and common chemical substances to predict the types of reactions and possible outcomes of the reactions.</p> <p>P.7.5D.1 Analyze evidence from scientific investigations to predict likely outcomes of chemical reactions.</p> <p>P.7.5D.2 Design and conduct scientific investigations to support evidence that chemical reactions (e.g., cooking, combustion, rusting, decomposition, photosynthesis, and cellular respiration) have occurred.</p> <p>P.7.5D.3 Collect, organize, and interpret data using various tools (e.g., litmus paper, pH paper, cabbage juice) regarding neutralization of acids and bases using common substances.</p> <p>P.7.5D.4 Build a model to explain that chemical reactions can store (formation of bonds) or release energy (breaking of bonds).</p>

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<p>2c. Compare the force (effort) required to do the same amount of work with and without simple machines (e.g., levers, pulleys, wheel and axle, inclined planes).</p>	<p><i>Expanded and moved to Grade 6 (P.6.6)</i></p>
<p>2d. Describe cause and effect relationships of electrical energy.</p> <ul style="list-style-type: none"> • Energy transfers through an electric circuit (using common pictures and symbols) • Electric motor energy transfers (e.g., chemical to electrical to mechanical motion) and generators) 	<p><i>Moved to Grade 4 (P.4.6A)</i></p>
<p>2e. Distinguish how various types of longitudinal and transverse waves (e.g., water, light, sound, seismic) transfer energy.</p> <ul style="list-style-type: none"> • Frequency • Wavelength • Speed • Amplitude 	<p><i>Expanded and moved to Grade 8 (P.8.6)</i></p>
<p>2f. Describe the effects of unbalanced forces on the speed or direction of an object’s motion.</p> <ul style="list-style-type: none"> • Variables that describe position, distance, displacement, speed, and change in speed of an object • Gravity, friction, drag, lift, electric forces, and magnetic forces) 	<p><i>Expanded and moved to Grade 6 (P.6.6)</i></p>

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<i>Similar topic taught in Grade 6</i>	<p>P.7.5A Students will demonstrate an understanding of the physical and chemical properties of matter.</p> <p>P.7.5A.1 Collect and evaluate qualitative data to describe substances using physical properties (state, boiling/melting point, density, heat/electrical conductivity, color, and magnetic properties).</p> <p>P.7.5A.2 Analyze and interpret qualitative data to describe substances using chemical properties (the ability to burn or rust).</p> <p>P.7.5A.3 Compare and contrast chemical and physical properties (e.g., combustion, oxidation, pH, solubility, reaction with water).</p>
<i>Similar topic taught in Grade 6</i>	<p>P.7.5B Students will demonstrate an understanding about the effects of temperature and pressure on physical state, molecular motion, and molecular interactions.</p> <p>P.7.5B.1 Make predictions about the effect of temperature and pressure on the relative motion of atoms and molecules (speed, expansion, and condensation) relative to recent breakthroughs in polymer and materials science (e.g. self-healing protective films, silicone computer processors, pervious/porous concrete).</p> <p>P.7.5B.2 Use evidence from multiple scientific investigations to communicate the relationships between pressure, volume, density, and temperature of a gas.</p> <p>P.7.5B.3 Ask questions to explain how density of matter (observable in various objects) is affected by a change in heat and/or pressure.</p>
<i>Similar topic taught in Physical Science</i>	<p>P.7.5E Students will demonstrate an understanding of the law of conservation of mass.</p> <p>P.7.5E.1 Conduct simple scientific investigations to show that total mass is not altered during a chemical reaction in a closed system. Compare results of investigations to Antoine-Laurent Lavoisier’s discovery of the law of conservation of mass.</p> <p>P.7.5E.2 Analyze data from investigations to explain why the total mass of the product in an open system appears to be less than the mass of reactants.</p> <p>P.7.5E.3 Compare and contrast balanced and unbalanced chemical equations to demonstrate the number of atoms does not change in the reaction.</p>

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science
Earth Science Grade 7**

2010 MS Framework G7 - Earth Science	2018 MS CCRS for Science G7 – Earth Science
Competency 4. Describe the properties and structure of the sun and the moon with respect to the Earth.	Standard statements are in bold font below.
4a. Justify the importance of Earth materials (e.g., rocks, minerals, atmospheric gases, water) to humans.	<i>Expanded and moved to Grade 8 (E.8.9A)</i>
4b. Explain the causes and effects of historical processes shaping the planet Earth (e.g., movements of the continents, continental plates, subduction zones, trenches, etc).	<i>Expanded and moved to Grade 8 (E.8.9A)</i>
<p>4c. Describe the causes and effects of heat transfer as it relates to the circulation of ocean currents, atmospheric movement, and global wind patterns (e.g., trade winds, the jet stream). Provide examples of how these global patterns can affect local weather.</p> <ul style="list-style-type: none"> • Characteristics of the Gulf Stream and other large ocean currents • Effects on climate in Eastern North America and Western Europe • Effects of heat transfer to the movement of air masses, high and low pressure areas, and fronts in the atmosphere 	<p>E.7.9A Students will demonstrate an understanding of how complex changes in the movement and patterns of air and water molecules caused by the sun, winds, landforms, ocean temperatures, and currents in the atmosphere are major determinants of local and global weather patterns.</p> <p>E.7.9A.1 Analyze and interpret weather patterns from various regions to differentiate between weather and climate.</p> <p>E.7.9A.2 Analyze evidence to explain the weather conditions that result from the relationship between the movement of water and air masses.</p> <p>E.7.9A.3 Interpret atmospheric data from satellites, radar, and weather maps to predict weather patterns and conditions.</p> <p>E.7.9A.4 Construct an explanation for how climate is determined in an area using global and surface features (e.g. latitude, elevation, shape of the land, distance from water, global winds and ocean currents).</p> <p>E.7.9A.5 Analyze models to explain the cause and effect relationship between solar energy and convection and the resulting weather patterns and climate conditions.</p> <p>E.7.9A.6 Research and use models to explain what type of weather (thunderstorms, hurricanes, and tornadoes) results from the movement and interactions of air masses, high and low pressure systems, and frontal boundaries.</p> <p>E.7.9A.7 Interpret topographic maps to predict how local and regional geography affect weather patterns and make them difficult to predict.</p>

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<p>4d. Conclude why factors, such as lack of resources and climate can limit the growth of populations in specific niches in the ecosystem.</p> <ul style="list-style-type: none"> • Abiotic factors that affect population, growth, and size (quantity of light, water, range of temperatures, soil compositions) • Cycles of water, carbon, oxygen, and nitrogen in the environment • Role of single-celled organisms (e.g., phytoplankton) in the carbon and oxygen cycles) 	<p><i>See Grade 7 Life Science (L.7.3)</i></p>
<p>4e. Research and develop a logical argument to support the funding of NASA’s Space Programs</p> <ul style="list-style-type: none"> • Space exploration (e.g., telescopes, radio telescopes, X-ray telescopes, cameras, spectro-meters, etc.) • Spinoffs (e.g., laser, pacemaker, dehydrated food, flame retardant clothing, global positioning system [GPS], satellite imagery, global weather information, diagnostic imagery) • Mississippi’s contributions to the space industry 	<p><i>Similar topics found in Grade 5 (E.5.8B)</i></p>
<p>4f. Distinguish the structure and movements of objects in the solar system</p> <ul style="list-style-type: none"> • Sun’s atmosphere (corona, chromosphere, photosphere and core) • How phenomena on the sun’s surface (e.g., sunspots, prominences, solar wind, solar flares) affect Earth (e.g., auroras, interference in radio and television communication) 	<p><i>Similar topics found in Grade 5 (E.5.8B) and Grade 6 (E.6.8)</i></p>

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<p>4g. Research and evaluate the use of renewable and nonrenewable resources and critique efforts in the United States including (but not limited) to Mississippi to conserve natural resources and reduce global warming</p> <ul style="list-style-type: none"> • How materials are reused in a continuous cycle in ecosystems, (e.g., Mississippi Ethanol Gasification Project to develop and demonstrate technologies for the conversion of biomass to ethanol) • Benefits of solid waste management (reduce, reuse, recycle) • Conserving renewable and nonrenewable resources (e.g., The Recycling and Solid Waste Reduction Program in Jackson, MS) 	<p>E.7.9B Students will demonstrate an understanding of the relationship between natural phenomena, human activity, and global climate change.</p> <p>E.7.9B.1 Read and evaluate scientific or technical information assessing the evidence and bias of each source to explain the causes and effects of climate change.</p> <p>E.7.9B.2 Interpret data about the relationship between the release of carbon dioxide from burning fossil fuels into the atmosphere and the presence of greenhouse gases.</p> <p>E.7.9B.3 Engage in scientific argument based on current evidence to determine whether climate change happens naturally or is being accelerated through the influence of man.</p>
<p>4h. Predict weather events by analyzing clouds, weather maps, satellites, and various data.</p>	<p>See E.7.9.A 1 - E.7.9.1.5 above</p>
<p><i>Similar topics taught in Grade 8</i></p>	<p>E.7.9C Students will demonstrate an understanding that the seasons are the direct result of the Earth’s tilt and the intensity of sunlight on the Earth’s hemispheres.</p> <p>E.7.9C.1 Construct models and diagrams to illustrate how the tilt of Earth’s axis results in differences in intensity of sunlight on the Earth’s hemispheres throughout the course of one full revolution around the Sun.</p> <p>E.7.9C.2 Investigate how variations of sunlight intensity experienced by each hemisphere (to include the equator and poles) create the four seasons.</p>