**Crosswalk 2010 MS Science - 2018 MS CCRS for Science**
**Inquiry Strand Grade 5**

| **2010 MS Framework G5 - Inquiry** | **2018 MS CCRS for Science - all grades and courses** |
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| **Competency 1. 1. Develop and demonstrate an understanding of scientific inquiry using process skills.** | 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.Form a hypothesis, predict outcomes, and conduct a fair investigation that includes manipulating variables and using experimental controls. | |
| 1b.Distinguish between observations and inferences. | |
| 1c. Use precise measurement in conjunction with simple tools and technology to perform tests and collect data.<br>• Tools (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)<br>• Types of data (height, mass, volume, temperature, length, time, distance, volume, perimeter, area) | |
| 1d. Organize and interpret data in tables and graphs to construct explanations and draw conclusions. | |
| 1e.Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions. | |
| 1f.Make and compare different proposals when designing a solution or product. | |
| 1g.Evaluate results of different data (whether trivial or significant). | |
| 1h. Infer and describe alternate explanations and predictions. | |

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science**
**Life Science Grade 5**

| **2010 MS Framework G5 – Life Science** | **2018 MS CCRS for Science G5 - Life Science** |
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| **Competency 3. Predict characteristics, structures, life cycles, environments, evolution, and diversity of organisms.** | **Standard statements are in bold font below.** |
| 3a. Compare and contrast the diversity of organisms due to adaptations to show how organisms have evolved as a result of environmental changes.<br>• Diversity based on kingdoms, phyla, and classes (e.g., internal/external structure, body temperature, size, shape)<br>• Adaptations that increase an organism's chances to survive and reproduce in a particular habitat (e.g., cacti needles/leaves, fur/scales)<br>• Evidence of fossils as indicators of how life and environmental conditions have changed | *Diversity/classification moved to Grade 6 (L.6.4)*<br>*Fossils - environmental changes moved to Grade 8 (E.8.7)* |
| 3b. Research and classify the organization of living things.<br>• Differences between plant and animal cells; Function of the major parts of body systems (nervous, circulatory, respiratory, digestive, skeletal, muscular) and the ways they support one another<br>• Examples of organisms as single-celled or multi-celled ) | *Cells moved to Grade 6 (L.6.1)*<br>*Body systems moved to Grade 4 (L.4.1)* |
| 3c. Research and cite evidence of the work of scientists (e.g., Pasteur, Fleming, Salk) as it contributed to the discovery and prevention of disease. | *Diseases moved to Grade 4 (L.4.1)* |

| **2010 MS Framework G5 – Life Science** | **2018 MS CCRS for Science G5 - Life Science** |
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| 3d. Distinguish between asexual and sexual reproduction.<br>• Asexual reproduction processes in plants and fungi (e.g., vegetative propagation in stems, roots, and leaves of plants, budding in yeasts, fruiting bodies in fungi)<br>• Asexual cell division (mushroom spores produced/dispersed) Sexual reproduction (e.g., eggs, seeds, fruit) | *Offspring from single parent vs. two parent organisms moved to Grade 3 (L.3.2)*<br>*Diversity of organisms and characteristics moved to Grade 6 (L.6.4)* |
| 3e. Give examples of how consumers and producers (carnivores, herbivores, omnivores, and decomposers) are related in food chains and food webs. | **L.5.3B Students will demonstrate an understanding of a healthy ecosystem with a stable web of life and the roles of living things within a food chain and/or food web, including producers, primary and secondary consumers, and decomposers.**<br>L.5.3B.1 Obtain and evaluate scientific information regarding the characteristics of different ecosystems and the organisms they support (e.g., salt and fresh water, deserts, grasslands, forests, rain forests, or polar tundra lands).<br>L.5.3B.2 Develop and use a food chain model to classify organisms as producers, consumers, or decomposers. Trace the energy flow to explain how each group of organisms obtains energy.<br>L.5.3B.3 Design and interpret models of food webs to justify what effects the removal or the addition of a species (i.e., introduced or invasive) would have on a specific population and/or the ecosystem as a whole.<br>L.5.3B.4 Communicate scientific or technical information that explains human positions in food webs and our potential impacts on these systems. |
| *Similar concepts previously taught in Grade 4* | **L.5.3A Students will demonstrate an understanding of photosynthesis and the transfer of energy from the sun into chemical energy necessary for plant growth and survival.**<br>L.5.3A.1 Research and communicate the basic process of photosynthesis that is used by plants to convert light energy into chemical energy that can be stored and released to fuel an organism's activities.<br>L.5.3A.2 Analyze environments that do not receive direct sunlight and devise explanations as to how photosynthesis occurs, either naturally or artificially. |

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science**
**Physical Science Grade 5**

| 2010 MS Framework G5 – Physical Science | 2018 MS CCRS for Science G5 – Physical Science Topics |
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| **Competency 2. Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world.** | **Standard statements are in bold font below.** |
| 2a. Determine how the properties of an object affect how it acts and interacts. | *See P.5.5A below* |
| 2b. Differentiate between elements, compounds, and mixtures and between chemical and physical changes (e.g., gas evolves, color, and/or temperature changes). | **P.5.5C Students will demonstrate an understanding of the difference between physical and chemical changes.**<br>P.5.5C.1 Analyze and communicate the results of chemical changes that result in the formation of new materials (e.g., decaying, burning, rusting, or cooking).<br>P.5.5C.2 Analyze and communicate the results of physical changes to a substance that results in a reversible change (e.g., changes in states of matter with the addition or removal of energy, changes in size or shape, or combining/separating mixtures or solutions).<br>P.5.5C.3 Analyze and interpret data to support claims that when two substances are mixed, the total weight of matter is conserved. |
| 2c. Investigate the motion of an object in terms of its position, direction of motion, and speed.<br>• The relative positions and movements of objects using points of reference (distance vs. time of moving objects)<br>• Force required to move an object using appropriate devices (e.g., spring scale)<br>• Variables that affect speed (e.g., ramp height/length/surface, mass of object)<br>• Effects of an unbalanced force on an object's motion in terms of speed and direction ) | **P.5.6 Students will demonstrate an understanding of the factors that affect the motion of an object through a study of Newton's Laws of Motion.**<br>P.5.6.1 Obtain and communicate information describing gravity's effect on an object.<br>P.5.6.2 Predict the future motion of various objects based on past observation and measurement of position, direction, and speed.<br>P.5.6.3 Develop and use models to explain how the amount or type of force, both contact and non-contact, affects the motion of an object.<br>P. 5.6.4 Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or direction of objects in motion.<br>P. 5.6.5 Predict how a change of force, mass, and/or friction affects the motion of an object to convert potential energy into kinetic energy.<br>P. 5.6.6 Design a system to increase the effects of friction on the motion of an object (e.g., non-slip surfaces or vehicle braking systems or flaps on aircraft wings). Use an engineering design process to define the problem, design, construct, evaluate, and improve the system.* |

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**Physical Science Grade 5**

| 2010 MS Framework G5 – Physical Science | 2018 MS CCRS for Science G5 – Physical Science Topics |
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| 2d. Categorize examples of potential energy as gravitational (e.g., boulder on a hill, child on a slide), elastic (e.g., compressed spring, slingshot, rubber band), or chemical (e.g., unlit match, food). | *See P. 5.6 above* |
| 2e. Differentiate between the properties of light as reflection, refraction, and absorption.<br>• Image reflected by a plane mirror and a curved-surfaced mirror<br>• Light passing through air or water<br>• Optical tools such as prisms, lenses, mirrors, and eyeglasses | *Expanded and moved to Grade 4 (P.4.6B)* |

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**Physical Science Grade 5**

| 2010 MS Framework G5 – Physical Science | 2018 MS CCRS for Science G5 – Physical Science Topics |
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| 2f. Describe physical properties of matter (e.g., mass, density, boiling point, freezing point) including mixtures and solutions.<br>• Filtration, sifting, magnetism, evaporation, and flotation<br>• Mass, density, boiling point, and freezing point of matter<br>• Effects of temperature changes on the solubility of substances | **P.5.5A Students will demonstrate an understanding of the physical properties of matter.**<br>P.5.5A.1 Obtain and evaluate scientific information to describe basic physical qualities of atoms and molecules.<br>P.5.5A.2 Collect, analyze, and interpret data from measurements of the physical properties of matter including solid, liquid, and gas (volume, shape, movement, and spacing of particles).<br>P.5.5A.3 Analyze matter through observations and measurements to classify materials (e.g., powders, metals, minerals, or liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, or density).<br>P.5.5A.4 Make and test predictions about how the density of an object affects whether the object sinks or floats when placed in a liquid.<br>P.5.5A.5 Design a vessel that can safely transport a dense substance (e.g., syrup, coins, marbles) through water at various distances and under variable conditions. Use an engineering design process to define the problem, design, construct, evaluate, and improve the vessel.*<br>**P.5.5B Students will demonstrate an understanding of mixtures and solutions.**<br>P.5.5B.1 Obtain and evaluate scientific information to describe what happens to the properties of substances in mixtures and solutions.<br>P.5.5B.2 Analyze and interpret data to communicate that the concentration of a solution is determined by the relative amount of solute versus solvent in various mixtures.<br>P.5.5B.3 Investigate how different variables (e.g., temperature change, stirring, particle size, or surface area) affect the rate at which a solute will dissolve.<br>P.5.5B.4 Design an effective system (e.g., sifting, filtration, evaporation, magnetic attraction, or floatation) for separating various mixtures. Use an engineering design process to define the problem, design, construct, evaluate, and improve the system.* |
| 2g. Categorize materials as conductors or insulators and discuss their real life applications (e.g., building construction, clothing, animal covering). | *Expanded and moved to Grade 4 (P.4.6A)* |

**Crosswalk 2010 MS Science - 2018 MS CCRS for Science**
**Earth Science Grade 5**

| 2010 MS Framework G5 - Earth Science | 2018 MS CCRS for Science G5 – Earth Science |
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| **Competency 4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth** | **Standard statements are in bold font below.** |
| 4a. Categorize Earth's materials<br>• Rocks, minerals, soils, water, and atmospheric gases<br>• Layers of the atmosphere, hydrosphere, and lithosphere | *Expanded and moved to Grade 3 (E.3.7A)* |
| 4b. Explain how surface features caused by constructive processes (e.g., depositions, volcanic eruptions, earthquakes) differ from destructive processes (e.g., erosion, weathering, impact of organisms). | *Expanded and moved to Grade 3 (E.3.7B)* |
| 4c. Summarize how weather changes.<br>• Weather changes from day to day and over the seasons<br>• Tools by which weather is observed, recorded, and predicted | *Moved to Grade 1 (E.1.9A)*<br>*Expanded and moved to Grade 4 (E.4.9B)* |
| 4d. Describe changes caused by humans on the environment and natural resources and cite evidence from research of ways to conserve natural resources in the United States, including (but not limited to) Mississippi. | *See E.5.10 below* |

| 2010 MS Framework G5 - Earth Science | 2018 MS CCRS for Science G5 – Earth Science |
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| 4e. Predict the movement patterns of the sun, moon, and Earth over a specified time period. | **E.5.8B Students will demonstrate an understanding of the principles that govern moon phases, day and night, appearance of objects in the sky, and seasonal changes.**<br>E.5.8B.1 Analyze and interpret data from observations and research (e.g., from NASA, NOAA, or the USGS) to explain patterns in the location, movement, and appearance of the moon throughout a month and over the course of a year.<br>E.5.8B.2 Develop and use a model of the Earth-Sun-Moon system to analyze the cyclic patterns of lunar phases, solar and lunar eclipses, and seasons.<br>E.5.8B.3 Develop and use models to explain the factors (e.g., tilt, revolution, and angle of sunlight) that result in Earth's seasonal changes.<br>E.5.8B.4 Obtain information and analyze how our understanding of the solar system has evolved over time (e.g., Earth-centered model of Aristotle and Ptolemy compared to the Sun-centered model of Copernicus and Galileo). |
| 4f. Compare and contrast the physical characteristics of the planets (e.g., mass, surface gravity, distance from the sun, surface characteristics, moons). | **E.5.8A Students will demonstrate an understanding of the locations of objects in the universe.**<br>E.5.8A.1 Develop and use scaled models of Earth's solar system to demonstrate the size, composition (i.e., rock or gas), location, and order of the planets as they orbit the Sun.<br>E.5.8A.2 Use evidence to argue why the sun appears brighter than other stars.<br>E.5.8A.3 Describe how constellations appear to move from Earth's perspective throughout the seasons (e.g., Ursa Major, Ursa Minor, and Orion).<br>E.5.8A.4 Construct scientific arguments to support claims about the importance of astronomy in navigation and exploration, including the use of telescopes, compasses, and star charts. |

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**Earth Science Grade 5**

| 2010 MS Framework G5 - Earth Science | 2018 MS CCRS for Science G5 – Earth Science |
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| 4g. Conclude that the supply of many Earth resources (e.g., fuels, metals, fresh water, farmland) is limited and critique a plan to extend the use of Earth's resources (e.g., recycling, reuse, renewal). | **E.5.10 Students will demonstrate an understanding of the effects of human interaction with Earth and how Earth's natural resources can be protected and conserved.**<br>E.5.10.1 Collect and organize scientific ideas that individuals and communities can use to conserve Earth's natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to reduce landfill waste).<br>E.5.10.2 Design a process for better preparing communities to withstand manmade or natural disasters (e.g., removing oil from water or soil, systems that reduce the impact of floods, structures that resist hurricane forces). Use an engineering design process to define the problem, design, construct, evaluate, and improve the disaster plan.* |