Mississippi Science

Grade Three

Life Science L

1 Hierarchical Organization L.3.1

Conceptual Understanding: Plants and animals have physical characteristics and features that allow them to receive information from the environment. Structural adaptations within groups of plants and animals allow them to better survive and reproduce in an environment.

A Students will demonstrate an understanding of internal and external structures in plants and animals and how they relate to their growth, survival, behavior, and reproduction within an environment. L.3.1A

1 Examine evidence to communicate information that the internal and external structures of animals (e.g., heart, stomach, bone, lung, brain, skin, ears, appendages) function to support survival, growth, and behavior. L.3.1A.1

2 Examine evidence to communicate information that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, or colored petals) function to support survival, growth, behavior, and reproduction. L.3.1A.2

3 Obtain and communicate examples of physical features or behaviors of vertebrates and invertebrates and how these characteristics help them survive in particular environments (e.g., animals hibernate, migrate, or estivate to stay alive when food is scarce, or temperatures are not favorable). L.3.1A.3

2 Reproduction and Heredity L.3.2

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Conceptual Understanding: Scientists have identified and classified many types of plants and animals. Some characteristics and traits that organisms have are inherited, and some result from interactions with the environment.

A Students will demonstrate an understanding that through reproduction, the survival and physical features of plants and animals are inherited traits from parent organisms but can also be influenced by the environment. L.3.2A

1 Identify traits and describe how traits are passed from parent organism(s) to offspring in plants and animals. L.3.2A.1

2 Describe and provide examples of plant and animal offspring from a single parent organism (e.g., bamboo, fern, or starfish) as being an exact replica with identical traits as the parent organism. L.3.2A.2

3 Describe and provide examples of offspring from two parent organisms as containing a combination of inherited traits from both parent organisms. L.3.2A.3

4 Obtain and communicate data to provide evidence that plants and animals have traits inherited from both parent organisms and that variations of these traits exist in groups of similar organisms (e.g., flower colors in pea plants or fur color and pattern in animal offspring). L.3.2A.4

5 Research to justify the concept that traits can be influenced by the environment (e.g., stunted growth in normally tall plants due to insufficient water, changes in an arctic fox's fur color due to light and/or temperature, or flamingo plumage). L.3.2A.5

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4 Adaptation and Diversity L.3.4

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Conceptual Understanding: When the environment or habitat changes, some plants and animals survive and reproduce, some move to new locations, and some die. Scientists can obtain historical information from fossils to provide evidence of both the organism and environments in which they lived.

A Students will demonstrate an understanding of how adaptations allow animals to satisfy life needs and respond both physically and behaviorally to their environment. L.3.4A

1 Obtain data from informational text to explain how changes in habitats (both those that occur naturally and those caused by organisms) can be beneficial or harmful to the organisms that live there. L.3.4A.1

2 Ask questions to predict how natural or human-caused changes in a habitat cause plants and animals to respond in different ways, including hibernating, migrating, responding to light, death, or extinction (e.g., sea turtles, the dodo bird, or nocturnal species). L.3.4A.2

3 Analyze and interpret data to explain how variations in characteristics among organisms of the same species may provide advantages in surviving, finding mates, and reproducing (e.g., plants with larger thorns being less likely to be eaten by predators or animals with better camouflage colorations being more likely to survive and bear offspring). L.3.4A.3

4 Define and improve a solution to a problem created by environmental changes and any resulting impacts on the types of density and distribution of plant and animal populations living in the environment (e.g., replanting sea oats in coastal areas or developing or preserving wildlife corridors and green belts). Use an engineering design process to define the problem, design, construct, evaluate, and improve the environment. * L.3.4A.4

5 Construct scientific arguments using evidence from fossils of plants and animals that lived long ago to infer the characteristics of early environments (e.g., marine fossils on dry land, tropical plant fossils in arctic areas, or fossils of extinct organisms in any environment). L.3.4A.5

Physical Science P

5 Organization of Matter and Chemical Interactions P.3.5

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Conceptual Understanding: Matter is made up of particles that are too small to be seen. Even though the particles are very small, the movement and spacing of these particles determine the basic properties of matter. Matter exists in several different states and is classified based on observable and measurable properties. Matter can be changed from one state to another when heat (i.e., thermal energy) is added or removed.

A Students will demonstrate an understanding of the physical properties of matter to explain why matter can change states between a solid, liquid, or gas dependent upon the addition or removal of heat. P.3.5A

1 Plan and conduct scientific investigations to determine how changes in heat (i.e., an increase or decrease) change matter from one state to another (e.g., melting, freezing, condensing, boiling, or evaporating). P.3.5A.1

2 Develop and use models to communicate the concept that matter is made of particles too small to be seen that move freely around in space (e.g., inflation and shape of a balloon, wind blowing leaves, or dust suspended in the air). P.3.5A.2

3 Plan and conduct investigations that particles speed up or slow down with addition or removal of heat. P.3.5A.3

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6 Motion, Forces, and Energy P.3.6

Conceptual Understanding: Magnets are a specific type of solid that can attract and repel certain other kinds of materials, including other magnets. There are some materials that are neither attracted to nor repelled by magnets. Because of their special properties, magnets are used in various ways. Magnets can exert forces—a push or a pull—on other magnets or magnetic materials, causing energy transfer between them, even when the objects are not touching.

A Students will demonstrate an understanding of magnets and the effects of pushes, pulls, and friction on the motion of objects. P.3.6A

1 Compare and contrast the effects of different strengths and directions of forces on the motion of an object (e.g., gravity, polarity, attraction, repulsion, or strength). P.3.6A.1

2 Plan an experiment to investigate the relationship between a force applied to an object (e.g., friction, gravity) and resulting motion of the object. P.3.6A.2

3 Research and communicate information to explain how magnets are used in everyday life. P.3.6A.3

Earth and Space Science E

7 Earth's Structure and History E.3.7

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Conceptual Understanding: Since its formation, the Earth has undergone a great deal of geological change driven by its composition and systems. Scientists use many methods to learn more about the history and age of Earth. Earth materials include rocks, soils, water, and gases. Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks. Soil is made partly from weathered rock, partly from plant remains, and contains many living organisms.

A Students will demonstrate an understanding of the various processes involved in the rock cycle, superposition of rock layers, and fossil formation. E.3.7A

1 Plan and conduct controlled scientific investigations to identify the processes involved in forming the three major types of rock, and investigate common techniques used to identify them. E.3.7A.1

2 Develop and use models to demonstrate the processes involved in the development of various rock formations, including superposition, and how those formations can fracture and move over time. E.3.7A.2

3 Ask questions to generate testable hypotheses regarding the formation and location of fossil types, including their presence in some sedimentary rock. E.3.7A.3

Conceptual Understanding: Earth has an active mantle, which interacts with the Earth's crust to drive plate tectonics and form new rocks. Resulting surface features change through interactions with water, air, and living things. Waves, wind, water, and ice shape and reshape the Earth's land surface by eroding rock and soil in some areas and depositing them in other areas. Scientists use many methods to learn more about the history and age of Earth.

B Students will demonstrate an understanding of the composition of Earth and the processes which change Earth's landforms. E.3.7B

1 Obtain and evaluate scientific information (e.g., using technology) to describe the four major layers of Earth and the varying compositions of each layer. E.3.7B.1

2 Develop and use models to describe the characteristics of Earth's continental landforms and classify landforms as volcanoes, mountains, valleys, canyons, plains, and islands. E.3.7B.2

3 Develop and use models of weathering, erosion, and deposition processes which explain the appearance of various Earth features (e.g., the Grand Canyon, Arches National Park in Utah, Plymouth Bluff in Columbus, or Red Bluff in Marion County, Mississippi). E.3.7B.3

4 Compare and contrast constructive (e.g., deposition, volcano) and destructive (e.g., weathering, erosion, earthquake) processes of the Earth. E.3.7B.4

9 Earth's Systems and Cycles E.3.9

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Conceptual Understanding: The Earth's land can be situated above or submerged below water. Water in the atmosphere changes physical states according to energy levels driven by the sun and its interactions with various Earth components, both living and non-living. The downhill movement of water as it flows to the ocean shapes the appearance of the land.

A Students will demonstrate an understanding of how the Earth's systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere) interact in multiple ways to affect Earth's surface materials and processes. E.3.9A

1 Develop models to communicate the characteristics of the Earth's major systems, including the geosphere, hydrosphere, atmosphere, and biosphere (e.g., digital models, illustrations, flip books, diagrams, charts, tables). E.3.9A.1

2 Construct explanations of how different landforms and surface features result from the location and movement of water on Earth's surface (e.g., watersheds, drainage basins, deltas, or rivers). E.3.9A.2

3 Use graphical representations to communicate the distribution of freshwater and saltwater on Earth (e.g., oceans, lakes, rivers, glaciers, groundwater, or polar ice caps). E.3.9A.3

10 Earth's Resources E.3.10

Conceptual Understanding: Earth is made of materials that provide resources for human activities, and their use affects the environment in multiple ways. Some resources are renewable, and others are not.

A Students will demonstrate an understanding that all materials, energy, and fuels that humans use are derived from natural sources. E.3.10A

1 Identify some of Earth's resources that are used in everyday life such as water, wind, soil, forests, oil, natural gas, and minerals and classify as renewable or nonrenewable. E.3.10A.1

2 Obtain and communicate information to exemplify how humans attain, use, and protect renewable and nonrenewable Earth resources. E.3.10A.2

3 Use maps and historical information to identify natural resources in the state connecting (a) how resources are used for human needs and (b) how the use of those resources impacts the environment. E.3.10A.3

4 Design a process for cleaning a polluted environment (e.g., simulating an oil spill in the ocean or a flood in a city and creating a solution for containment and/or cleanup). Use an engineering design process to define the problem, design, construct, evaluate, and improve the environment. * E.3.10A.4