Western Line School District Grade 6 Science Pacing Guide

2019-2020 Mississippi Science Framework

**LIFE SCIENCE**

|  |  |  |  |  |  |  |
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|  | **Objectives** | **DOK** | **Term 1** | **Term 2** | **Term 3** | **Term 4** |
| **L.6.1** | **Students will demonstrate an understanding that living things range from simple to complex organisms, are organized hierarchically, and function as whole living systems.** |
| **L.6.1.1** | Use argument supported by evidence in order to distinguish between living and non-living things, including viruses and bacteria. |  | **X** |  |  |  |
| **L.6.1.2** | Obtain and communicate evidence to support the cell theory. |  | **X** |  |  |  |
| **L.6.1.3** | Develop and use models to explain how specific cellular components (cell wall, cell membrane, nucleus, chloroplast, vacuole, and mitochondria) function together to support the life of prokaryotic and eukaryotic organisms to include plants, animals fungi, protists, and bacteria (not to include biochemical function of cells or cell part). |  | **X** |  |  |  |
| **L.6.1.4** | Compare and contrast different cells in order to classify them as a protest, fungus, plant, or animal. |  | **X** |  |  |  |
| **L.6.1.5** | Provide evidence that organisms are unicellular or multicellular. |  |  | **X** |  |  |
| **L.6.1.6** | Develop and use models to show relationships among the increasing complexity of multicellular organisms (cells, tissues, organs, organ systems, organisms) and how they serve the needs of the organism. |  |  | **X** |  |  |
| **L.6.3** | **Students will demonstrate an understanding of the relationships among survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment.** |
| **L.6.3.1** | Use scientific reasoning to explain differences between biotic and abiotic factors that demonstrate what living organisms need to survive. |  |  |  | **X** |  |
| **L.6.3.2** | Develop and use models to describe the levels of organization within ecosystems (species, populations, communities, ecosystems, and biomes). |  |  |  | **X** |  |
| **L.6.3.3** | Analyze cause and effect relationships to explore how changes in the physical environment (limiting factors, natural disasters) can lead to population changes within an ecosystem. |  |  |  | **X** |  |
| **L.6.3.4** | Investigate organism interactions in a competitive or mutually beneficial relationship (predation, competition, cooperation, or symbiotic relationships). |  |  |  | **X** |  |
| **L.6.3.5** | Develop and use food chains, webs, and pyramids to analyze how energy is transferred through an ecosystem from producers (autotrophs) to consumers (heterotrophs, including humans) to decomposers. |  |  |  | **X** |  |
| **L.6.4** | **Students will demonstrate an understanding of classification tools and models such as dichotomous keys to classify representative organisms based on the characteristics of the kingdoms: Archaebacteria, Eubacteria, Protists, Fungi, Plants, and Animals** |
| **L.6.4.1** | Compare and contrast modern classification techniques (e.g. analyzing genetic material) to the historical practices used by scientists such as Aristotle and Carolus Linnaeus. |  |  | **X** |  |  |
| **L.6.4.2** | Use classification methods to explore the diversity of organisms in kingdoms (animals, plants, fungi, protists, bacteria). Support claims that organisms have shared structural and behavioral characteristics. |  |  | **X** |  |  |
| **L.6.4.3** | Analyze and interpret data from observations to describe how fungi obtain energy and respond to stimuli (e.g., bread mold, rotting plant material). |  |  | **X** |  |  |
| **L.6.4.4** | Conduct investigations using a microscope or multimedia source to compare the characteristics of protists (euglena, paramecium, amoeba) and the methods they use to obtain energy and move through their environment (e.g., pond water) |  |  | **X** |  |  |
| **L.6.4.5** | Engage in scientific arguments to support claims that bacteria (Archaebacteria and Eubacteria) and viruses can be both helpful and harmful to other organisms and the environment. |  |  | **X** |  |  |
| **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.** |
| **L.7.3.1** | 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.  |  |  |  | **X** |  |
| **L.7.3.2** | 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.  |  |  |  | **X** |  |
| **L.7.3.3** | 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.  |  |  |  | **X** |  |
| **L.7.3.4** | 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.  |  |  |  | **X** |  |
| **L.7.3.5** | 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).\* |  |  |  | **X** |  |
| **L.8.2.A** | **L.8.2A Students will demonstrate an understanding of how sexual reproduction results in offspring with genetic variation while asexual reproduction results in offspring with identical genetic information.**  |
| **L.8.2.A.1** | L.8.2A.1 Obtain and communicate information about the relationship of genes, chromosomes, and DNA, and construct explanations comparing their relationship to inherited characteristics.  |  |  |  |  | **X** |
|  | L.8.2A.2 Create a diagram of mitosis and explain its role in asexual reproduction, which results in offspring with identical genetic information.  |  |  |  |  | **X** |
|  | L.8.2A.3 Construct explanations of how genetic information is transferred during meiosis.  |  |  |  |  | **X** |
|  | L.8.2A.4 Engage in discussion using models and evidence to explain that sexual reproduction produces offspring that have a new combination of genetic information different from either parent.  |  |  |  |  | **X** |
|  | L.8.2A.5 Compare and contrast advantages and disadvantages of asexual and sexual reproduction.  |  |  |  |  | **X** |
| **L.8.2C** | **L.8.2C Students will demonstrate an understanding that chromosomes contain many distinct genes and that each gene holds the instructions for the production of a specific protein, which in turn affects the traits of an individual.**  |
| **L.8.2C.1** | L.8.2C.1 Communicate through diagrams that chromosomes contain many distinct genes and that each gene holds the instructions for the production of specific proteins, which in turn affects the traits of the individual (not to include transcription or translation).  |  |  |  |  | **X** |
| **L.8.2C.2** | L.8.2C.2 Construct scientific arguments from evidence to support claims about the potentially harmful, beneficial, or neutral effects of genetic mutations on organisms. |  |  |  |  | **X** |
| **L.8.2B** | **L.8.2B Students will demonstrate an understanding of the differences in inherited and acquired characteristics and how environmental factors (natural selection) and the use of technologies (selective breeding, genetic engineering) influence the transfer of genetic information.**  |
| **L.8.2B.1** | L.8.2B.1 Construct an argument based on evidence for how environmental and genetic factors influence the growth of organisms.  |  |  |  |  | **X** |
| **L.8.2B.2** | L.8.2B.2 Use various scientific resources to research and support the historical findings of Gregor Mendel to explain the basic principles of heredity.  |  |  |  |  | **X** |
| **L.8.2B.3** | L.8.2B.3 Use mathematical and computational thinking to analyze data and make predictions about the outcome of specific genetic crosses (monohybrid Punnett Squares) involving simple dominant/recessive traits.  |  |  |  |  | **X** |
| **L.8.2B.4** | L.8.2B.4 Debate the ethics of artificial selection (selective breeding, genetic engineering) and the societal impacts of humans changing the inheritance of desired traits in organisms.  |  |  |  |  | **X** |
| **L.8.4A** | **L.8.4A Students will demonstrate an understanding of the process of natural selection, in which variations in a population increase some individuals’ likelihood of surviving and reproducing in a changing environment.**  |
| **L.8.4A.1** | L.8.4A.1 Use various scientific resources to analyze the historical findings of Charles Darwin to explain basic principles of natural selection.  |  |  | **X** |  |  |
| **L.8.4A.2** | L.8.4A.2 Investigate to construct explanations about natural selection that connect growth, survival, and reproduction to genetic factors, environmental factors, food intake, and interactions with other organisms. |  |  | **X** |  |  |
| **L.8.4.B** | **L.8.4B Students will demonstrate an understanding of how similarities and differences among living and extinct species provide evidence that changes have occurred in organisms over time and that similarity of characteristics provides evidence of common ancestry.** |
| **L.8.4B.1** | L.8.4B.1 Analyze and interpret data (e.g. pictures, graphs) to explain how natural selection may lead to increases and decreases of specific traits in populations over time.  |  |  | **X** |  |  |
| **L.8.4B.2** | L.8.4B.2 Construct written and verbal explanations to describe how genetic variations of traits in a population increase some organisms’ probability of surviving and reproducing in a specific environment.  |  |  | **X** |  |  |
| **L.8.4B.3** | L.8.4B.3 Obtain and evaluate scientific information to explain that separated populations, that remain separated, can evolve through mutations to become a new species (speciation).  |  |  | **X** |  |  |
| **LL.8.4B.4** | L.8.4B.4 Analyze displays of pictorial data to compare and contrast embryological and homologous/analogous structures across multiple species to identify evolutionary relationships. |  |  | **X** |  |  |