

Kindergarten	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade
Diversity and Adaptations of Organisms								
<p>3a. Group animals and plants by their physical features (e.g., size, appearance, and color). (DOK 2)</p>	<p>3a. Classify animals and plants by observable features (e.g., size, appearance, color, motion, and habitat). (DOK 2)</p> <p>3f. Identify and label the parts of a plant. (DOK 2)</p>	<p>3a. Describe and categorize the characteristics of plants and animals. (DOK 2)</p> <ul style="list-style-type: none"> Plant parts (leaves, stems, roots, and flowers) Animals (vertebrates or invertebrates, cold-blooded or warm-blooded) 	<p>3a. Research and explain diverse life forms (including vertebrates and invertebrates) that live in different environments (e.g., deserts, tundras, forests, grasslands, taigas, wetlands) and the structures that serve different functions in their survival (methods of movement, defense, camouflage). (DOK 2)</p>	<p>3a. Describe the cause and effect relationships that explain the diversity and evolution of organisms over time. (DOK 2)</p> <ul style="list-style-type: none"> Observable traits due to inherited or environmental adaptations Variations in environment (over time and from place to place) Variations in species as exemplified by fossils Extinction of a species due to insufficient adaptive capability in the face of environmental changes 	<p>3a. Compare and contrast the diversity of organisms due to adaptations to show how organisms have evolved as a result of environmental changes. (DOK 2)</p> <ul style="list-style-type: none"> Diversity based on kingdoms, phyla, and classes (internal/external structure, body temperature, size, and shape) Adaptations that increase an organism's chances to survive and reproduce in a particular habitat (e.g., cacti needles/leaves, fur/scales) Evidence of fossils as indicators of how life and environmental conditions have changed 	<p>3a. Describe and predict interactions (among and within populations) and the effects of these interactions on population growth to include the effects on available resources. (DOK 2)</p> <ul style="list-style-type: none"> How cooperation, competition and predation affect population growth Effects of overpopulation within an ecosystem on the amount of resources available How natural selection acts on a population of organisms in a particular environment via enhanced reproductive success 	<p>3a. Assess how an organism's chances of survival are influenced by adaptations to its environment. (DOK 2)</p> <ul style="list-style-type: none"> The importance of fungi as decomposers The major characteristics of land biomes (e.g., tropical rainforests, temperate rainforests, deserts, tundra, coniferous forests/taiga, deciduous forests) The adaptations of various plants to survive and reproduce in different biomes 	<p>3a. Analyze how adaptations to a particular environment (e.g., desert, aquatic, high altitude) can increase an organism's survival and reproduction and relate organisms and their ecological niches to evolutionary change and extinction. (DOK 3)</p>
Structure and Function in Living Systems								
<p>3b. Compare and contrast physical characteristics of humans. (DOK1)</p> <ul style="list-style-type: none"> The five senses (sight, smell, touch, taste, hearing) and corresponding body parts The six major body organs (brain, skin, heart, lungs, stomach, intestines). 	<p>3b. Describe the primary function of the major body organs (brain, skin, heart, lungs, stomach, intestines, bones, and muscles). (DOK 2)</p>	<p>3b. Describe the human body systems with their basic functions and major organs (e.g., brain-nervous, bones-skeletal, muscles-muscular). (DOK 1)</p>	<p>3b. Identify and describe the purpose of the digestive, nervous, skeletal, and muscular systems of the body. (DOK 1)</p> <p>3f. Recognize that cells vary greatly in size, structure, and function, and that some cells and tiny organisms can be seen only with a microscope. (DOK 1)</p>	<p>3b. Classify the organs and functions of the nervous, circulatory, and respiratory systems of the body. (DOK 1)</p> <p>3f. Describe the structural and functional relationships among the cells of an organism. (DOK 2)</p> <ul style="list-style-type: none"> Benefit from cooperating Vary greatly in appearance Perform very different roles 	<p>3b. Research and classify the organization of living things. (DOK 2)</p> <ul style="list-style-type: none"> Function of the major parts of body systems (nervous, circulatory, respiratory, digestive, skeletal, muscular) and the ways they support one another Examples of organisms as single-celled or multi-celled 	<p>3b. Compare and contrast structure and function in living things to include cells and whole organisms. (DOK 2)</p> <ul style="list-style-type: none"> Hierarchy of cells, tissues, organs, and organ systems to their functions in an organism Function of plant and animal cell parts (vacuoles, nucleus, cytoplasm, cell membrane, cell wall, chloroplast) Vascular and nonvascular Nonvascular plants, 	<p>3b. Classify the organization and development of living things to include prokaryotic (e.g., bacteria) and eukaryotic organisms (e.g., protozoa, certain fungi, and multicellular animals and plants). (DOK 2)</p>	<p>3b. Compare and contrast the major components and functions of different types of cells. (DOK 2)</p> <ul style="list-style-type: none"> Differences in plant and animal cells Structures (nucleus, cytoplasm, cell membrane, cell wall, mitochondrion, and nuclear membrane) Different types of cells and tissues (e.g., epithelial, nerve, bone, blood, muscle)

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Regulation and Behavior								
<p>3c. Classify parts of the human body that help it seek, find, and take in food when it feels hunger. (DOK 1)</p> <ul style="list-style-type: none"> Eyes and nose for detecting food Legs to get it Arms to carry it away Mouth to eat it 	<p>3c. Communicate the importance of food, and explain how the body utilizes food. (DOK 2)</p>	<p>3c. Identify the cause/ effect relationships when basic needs of plants and animals are met and when they are not met. (DOK 1)</p>	<p>3c. Investigate the relationships between the basic needs of different organisms and discern how adaptations enable an organism to survive in a particular environment. (DOK 2)</p>	<p>3c. Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment. (DOK 2)</p> <ul style="list-style-type: none"> Life cycles of various animals to include complete and incomplete metamorphosis Plant or animal structures that serve different functions in growth, adaptation, and survival Photosynthesis 	<p>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. (DOK 3)</p>	<p>3c. Distinguish between the organization and development of humans to include the effects of disease. (DOK 2)</p> <ul style="list-style-type: none"> How systems work together (e.g., respiratory, circulatory) Fertilization, early cell division, implantation, embryonic and fetal development, infancy, childhood, adolescence, adulthood, and old age Common diseases caused by microorganisms (e.g., bacteria, viruses, malarial parasites) 	<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). (DOK 3)</p>	<p>3c. Describe how viruses, bacteria, fungi, and parasites may infect the human body and interfere with normal body functions. (DOK 1)</p> <p>3g. Research and draw conclusions about the use of single-celled organisms in industry, in the production of food, and impacts on life. (DOK 3)</p>
Reproduction and Heredity								
<p>3d. Identify offspring that resemble their parents. (DOK 1)</p>	<p>3d. Chart and compare the growth and changes of animals from birth to adulthood. (DOK 2)</p>	<p>3d. Compare the life cycles of plants and animals. (DOK 2)</p>	<p>3d. Illustrate how the adult animal will look, when given pictures of young animals (e.g., birds, fish, cats, frogs, caterpillars, etc.). (DOK 2)</p>	<p>3d. Distinguish the parts of plants as they relate to sexual reproduction and assess the effects of various actions on the pollination process (e.g., wind, water, insects, adaptations of flowering plants, negative impacts of pesticides). (DOK 1)</p>	<p>3d. Distinguish between asexual and sexual reproduction. (DOK 1)</p> <ul style="list-style-type: none"> Asexual reproduction processes in plants and fungi (vegetative propagation in stems, roots, and leaves of plants, budding in yeasts, fruiting bodies in fungi) Asexual cell division (e.g., mushroom spores produced/dispersed) Sexual reproduction (eggs, seeds, fruit) 	<p>3d. Describe and summarize how an egg and sperm unite in the reproduction of angiosperms and gymnosperms. (DOK 1)</p> <ul style="list-style-type: none"> The path of the sperm cells to the egg cell in the ovary of a flower The structures and functions of parts of a seed in the formation of a plant and of fruits How the combination of sex cells results in a new combination of genetic information different from either parent 	<p>3d. Compare and contrast reproduction in terms of the passing of genetic information (DNA) from parent to offspring. (DOK 2)</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>3d. Describe heredity as the passage of instructions from one generation to another and recognize that hereditary information is contained in genes, located in the chromosomes of each cell. (DOK 2)</p> <ul style="list-style-type: none"> How traits are passed from parents to offspring through pairs of genes Phenotypes and genotypes Hierarchy of DNA, genes, and chromosomes and their relationship to phenotype Punnett square calculations <p>3f. Develop a logical argument for or against research conducted in selective breeding and</p>

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<p>genetic engineering, including (but not limited to) research conducted in Mississippi. Examples from Mississippi include the following: (DOK 3)</p> <ul style="list-style-type: none"> • The Animal Functional Genomics Laboratory at Mississippi State • The Stoneville Pedigreed Seed Company in Stoneville, MS • Catfish Genetics Research Unit at the Thad Cochran National Warm Water Aquaculture Center in Stoneville, MS 								
Interdependence of Life								
<p>3e. Recognize and compare the differences between living organisms and non-living materials. (DOK 2)</p>	<p>3e. Identify the basic needs of plants and animals, recognize that plants and animals both need to take in water, animals need food, and plants need light. (DOK 1)</p>	<p>3e. Investigate and explain the interdependence of plants and animals. (DOK 2)</p> <ul style="list-style-type: none"> • Herbivore, carnivore, or omnivore • Predator-prey relationships 	<p>3e. Recall that organisms can survive only in environments (deserts, tundras, forests, grasslands, taigas, wetlands) in which their needs are met and interpret the interdependency of plants and animals within a food chain, including producer, consumer, decomposer, herbivore, carnivore, omnivore, predator, and prey. (DOK 2)</p>	<p>3e. Analyze food webs to interpret how energy flows from the sun. (DOK 2)</p>	<p>3e. Give examples of how consumers and producers (carnivores, herbivores, omnivores, and decomposers) are related in food chains and food webs. (DOK 1)</p>	<p>3e. Construct a diagram of the path of solar energy through food webs that include humans and explain how the organisms relate to each other. (DOK 2)</p> <ul style="list-style-type: none"> • Autotrophs and heterotrophs, producers, consumers and decomposers • Predator/prey relationships, competition, symbiosis, parasitism, commensalisms, mutualism 	<p>3e. Compare and contrast how organisms obtain and utilize matter and energy. (DOK 1)</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>3e. Explain energy flow in a specified ecosystem. (DOK 2)</p> <ul style="list-style-type: none"> • Populations, communities, and habitats • Niches, ecosystems, and biomes • Producers, consumers, and decomposers in an ecosystem <p>3h. Describe how organisms get energy from oxidizing their food, and release some of their energy as heat. (DOK 1)</p>