PHASE IV LIFE SCIENCE CURRICULUM

Course 18000

Phase IV Science is a science program where seventh and eighth grade students will engage in learning from the three disciplines of science: earth science, life science, and physical science. The program engages students in three learning pathways: reading/writing, hands-on activities, and online content and activities. The Life Science component of this series covers topics like: classification of living things, cell structure and function, cell reproduction, heredity, evolution, kingdoms of living organisms, body systems in humans, and ecology.

PHASE IV LIFE SCIENCE OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
• Explain how biologists classify organisms and how they assign scientific names. • Describe the functions of cell structures and organelles. • Describe what happens during photosynthesis and respiration. • Understand the process by which cells and organisms replicate themselves including the role of DNA and the principles of inheritance. • Summarize the evidence that supports the theory of evolution. • Describe the major characteristics of the major groupings of living organisms (Viruses, Protista, Fungi, Plants, and Animals.) • Summarize the parts and processes of the major human body systems. • Give examples of how systems are regulated with in the human body. • Discuss how organisms interact and survive within communities and biomes.	• Use models to explain scientific concepts and principles. • Recognize and describe reoccurring patterns in the world around us. • Use tools and equipment to make observations and gather scientific data.	End of Chapter Tests	1-year	Pearson: Interactive Science-Life Science

PHASE IV LIFE SCIENCE MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Chapter 1 Introduction to Life (2 weeks)	• All living things reproduce, require energy, and are made of cells, respond to stimuli, and grow and develop. • Biologists use classification to organize organisms into groups. • There are levels of classification. • Organisms are placed into domains and kingdoms based on their cell type, number of cells, and their ability to make food. • Species with similar evolutionary histories are classified more closely together.	1. What is life? 2. Classifying life 3. Domains and Kingdoms 4. Evolution and Classification	• What are the characteristics of all living things? • Where do living things come from? • What do all living things need to survive? • Why do biologists classify organisms? • What are the levels of classification? • How are taxonomic keys useful? • How are organisms classified into domains and kingdoms? • How are evolution and classification related?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.3 Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and Protista). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Explain the relationship between evolution and classification. • Explain how organisms are classified into domains and kingdoms. • Explain how biologists classify organisms and how they assign scientific names. • Describe the organization of the levels of classification. • Explain how taxonomic keys are useful. • List the characteristics that all living things share. • Explain where living things come from. • Identify what all living things need to survive.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects
Chapter 2 Introduction to Cells (2.5 weeks)	• Cells are the basic building blocks of all living things. • All living things are made of cells and cells come from other cells. • Each kind of cell structure has a different function within a cell. • In multicellular organisms, cells work	1. Discovering cells 2. Looking inside cells 3. Chemical compounds in cells 4. The cell in its environment	• What are cells? • What is the cell theory? • How do microscopes work? • How do the parts of a cell work? • How do cells work together	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures	• Tell what cells are. • Describe how scientists first observed cells and constructed the cell theory. • Describe how microscopes produce magnified images.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and Projects

	together to create tissues, organs, and organ systems. • Important compounds in cells include carbohydrates, lipids, proteins, nucleic acids, and water. • Substances move in and out of cells in one of two ways, active transport or passive transport.		in an organism? • What are elements and compounds? • What compounds do cells need? • How do materials move into and out of a cell?	(e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Describe the functions of cell structures and organelles. • Describe how cells are organized in many-celled organisms. • Define elements and compounds. • Identify the main compounds that are important in cells. • Describe how materials move into and out of cells.	Extended time for assignment when needed Separate testing environment when applicable.	
Chapter 3 Cell Processes and Energy (2 weeks)	• Nearly all living things get energy either directly or indirectly from the energy produced from the sun. • During photosynthesis, plants and some other organisms utilize energy from the sun to convert carbon dioxide and water into carbohydrates and oxygen. • During cellular respiration, cells break down glucose and other molecules in the presence of oxygen, releasing energy. • During fermentation, cells release energy without the use of oxygen. • Cell division allows organisms to grow, repair damaged structures, and reproduce.	1. Photosynthesis 2. Cellular respiration 3. Cell division	• How do living things get energy from the sun? • What happens during photosynthesis? • What happens during cellular respiration? • What happens during fermentation? • What are the functions of cell division? • What happens during the cell cycle?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.2.2.1 Identify and explain differences between inherited and acquired traits. S8.B.2.2.2 Recognize that the gene is the basic unit of inheritance, that there are dominant and recessive genes, and that traits are inherited.	• Explain how living things get energy from the sun. • Describe what happens during photosynthesis. • Describe the events that occur during respiration. • Tell what happens during fermentation. • Summarize the functions of cell division. • Identify the events that occur during the three stages of the cell cycle.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

Chapter 4 Genetics: The Science of Heredity (3 weeks)	• An organism's traits are controlled by the alleles it inherits from its parents. Some alleles are dominant while others are recessive. • In a genetic cross, the combination of alleles that parents pass to an offspring is based on probability. • An organism's phenotype is its physical appearance, its genotype is its genetic make-up. • Most traits are the result of a complex pattern of inheritance. • Environmental factors can affect the way in which traits are expressed. • The chromosome theory states that genes pass from their parents to the offspring on chromosomes. • Meiosis produces sex cells that have half as many chromosomes as body cells.	1. What is heredity? 2. Probability and heredity 3. Patterns of Inheritance 4. Chromosomes and inheritance.	• What did Mendel observe? • How do alleles affect inheritance? • How is probability related to inheritance? • What are phenotype and genotype? • How are most traits inherited? • How do genes and the environment interact? • How are chromosomes, genes, and inheritance related? • What happens during meiosis?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.2.2.1 Identify and explain differences between inherited and acquired traits. S8.B.2.2.2 Recognize that the gene is the basic unit of inheritance, that there are dominant and recessive genes, and that traits are inherited.	• Describe the results of Mendel's experiments. • Identify the roles of alleles in controlling the inheritance of traits. • Define probability and describe how it helps to explain the results of genetic crosses. • Explain what is meant by phenotype and genotype. • Describe at least 3 complex patterns of inheritance. • Discuss how characteristics result from inheritance and environmental factors. • Describe the role chromosomes and genes play in inheritance. • Identify the events that occur during meiosis and fertilization.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects
Chapter 5 DNA: The Code of Life (3 weeks)	• The order of the nitrogen bases along a gene forms a genetic code that specifies what type of protein will be produced. • Because of the way the nitrogen bases pair up, the order of the bases in each new DNA strand	1. The genetic code 2. How cells make proteins 3. Mutations 4. Human inheritance 5. Advances in genetics	• What forms the genetic code? • How does DNA copy itself? • How does a cell make proteins? • How can mutations	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures	• Explain what forms the genetic code. • Describe how DNA copies itself. • Describe how a cell produces proteins. • Identify how mutations can	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and Projects

	exactly matches the order in the original DNA strand. • During protein synthesis, the cell uses information from a gene on a chromosome to produce a specific protein. • Mutations can cause a cell to produce an incorrect protein during protein synthesis. This may result in abnormal traits. • Cancer begins when mutations disrupt the normal cell cycle, causing cells to divide in an uncontrolled way. • Human traits may be controlled by single genes with two alleles, by single genes with multiple alleles, or by many genes that act together. • Sex chromosomes carry genes that determine whether a person is male or female as well as other traits. • Selective breeding, cloning, and genetic engineering are three methods for developing organisms with desired traits.		affect an organism? • How is cancer related to mutations and cell cycle? • What are some patterns of human inheritance? • What are the functions of the sex chromosomes ? • How can organisms be produced with desired traits?	(e.g., appendages, body segments, type of covering, size, shape). S8.B.2.2.1 Identify and explain differences between inherited and acquired traits. S8.B.2.2.2 Recognize that the gene is the basic unit of inheritance, that there are dominant and recessive genes, and that traits are inherited.	affect an organism. • Explain how cancer is related to mutations and the cell cycle. • Identify some patterns of inheritance in humans. • Describe the functions of sex chromosomes. • Describe three ways to get desired traits.	Extended time for assignment when needed Separate testing environment when applicable.	
Chapter 6 Change Over Time (2 weeks)	• Darwin hypothesized that species change over many generations and become better adapted to new conditions.	1. Darwin's Theory 2. Evidence of Evolution 3. Rate of change	• What was Darwin's hypothesis? • What is natural selection? • What evidence	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2	• Describe how Darwin's observations helped him to develop his hypothesis. • Explain how natural selection	Students will be given the following: Preferential seating when applicable Study guides	Daily assessments End of chapter exams

	• Darwin proposed that, over a long time, natural selection can lead to change. Helpful variations may accumulate in a species, while unfavorable ones may disappear. • Fossils, patterns of early development, similar body structures, and similarities in DNA and protein structures all provide evidence that organisms have changed over time. • A new species can form when a group of individuals remains isolated from the rest of its species long enough to evolve different traits that prevent reproduction. • Scientists have developed two patterns to describe the pace of evolution.		supports evolution? • How do new species form? • What patterns describe the rate of evolution?	Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.2.1.1 Explain how inherited structures or behaviors help organisms survive and reproduce in different environments. S8.B.2.1.2 Explain how different adaptations in individuals of the same species may affect survivability or reproduction success. S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations. S8.B.2.1.4 Describe how selective breeding or biotechnology can change the genetic makeup of organisms. S8.B.2.1.5 Explain that adaptations are developed over long periods of time and are passed from one generation to another. S8.B.2.2.1 Identify and explain differences between inherited and acquired traits. S8.B.2.2.2 Recognize that the gene is the basic unit of inheritance, that there are dominant and recessive genes, and that traits are inherited.	leads to evolution. • State the evidence that supports the theory of evolution. • Explain how new species form. • Identify the two patterns that describe the rate of evolution.	Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Labs and Projects
Chapter 7 Viruses, Bacteria, Protists, and Fungi (2.5 weeks)	• Viruses are nonliving, have a protein coat that cannot reproduce on their own. • Though viruses can cause disease, they can also be used to	1. Viruses 2. Bacteria 3. Protists 4. Fungi	• What are the characteristics of viruses? • How do viruses interact with	S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape).	• Name and describe the characteristics of viruses and how they multiply.	Students will be given the following: Preferential seating when applicable Study guides	Daily assessments End of chapter exams

	treat and prevent illnesses. • Bacteria are prokaryotes. The genetic material in their cells is not contained in a nucleus. • Bacteria get energy by either making food or eating other organisms, and can reproduce asexually or sexually. • Bacteria are involved in oxygen and food production, in health maintenance and medicine production, and in environmental cleanup and recycling. • Like animals, animal-like protists are heterotrophs, and most can move to get food. • Algae are autotrophs, can be unicellular or multicellular, and use pigments to capture the sun's energy. • Fungus-like protists are heterotrophs, have cell walls, and use spores to reproduce. • Fungi are eukaryotes that have cell walls, are heterotrophs that feed by absorbing their food, and use spores to reproduce. • Fungi may act as decomposers and recyclers, or provide foods for people. Fungi may help fight or cause disease. Some fungi live in a		the living world? • What are bacteria? • How do bacteria get food, get energy, and reproduce? • What is the role of bacteria in nature? • What are the characteristics of animal-like protists? • What are the characteristics of plant-like protists? • What are the characteristics of fungus-like protists? • What are the characteristics of fungi? • What is the role of fungi in nature?	S8.B.2.1.1 Explain how inherited structures or behaviors help organisms survive and reproduce in different environments. S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations. S8.B.2.1.4 Describe how selective breeding or biotechnology can change the genetic makeup of organisms.	• Discuss both positive and negative ways that viruses affect living things. • Name and describe structures, shapes, and sizes of a bacteria cell. • Describe how bacteria obtain food, obtain energy, and reproduce. • Describe the positive roles that bacteria play in the natural world. • Describe the characteristics of animal-like protists and give examples. • Describe the characteristics of plant-like protists and give examples. • Describe the characteristics of fungus-like protists and give examples. • Name and describe the characteristics of fungi and how they reproduce. • Describe the roles the fungi play in the natural world	Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Labs and Projects

	beneficial relationship with other organisms.						
Chapter 8 Plants (3 weeks)	• Nearly all plants are autotrophs. • For plants to survive on land, they must have ways to obtain water and nutrients, retain water, support their bodies, transport materials and reproduce. • A plant's roots, stems, and leaves anchor the plant, absorb water and minerals, capture the sun's energy, and make food. • A seed contains a partially developed plant. • A typical flower contains sepals, petals, stamens, and pistils. • Plants show growth responses, or tropisms, toward touch, gravity, and light. • The amount of darkness a plant receives determines the time of flowering in many plants. Dormancy helps plants survive the winter. • Nonvascular plants are low-growing, have thin cell walls, and do not have roots. • Seedless vascular plants have vascular tissue and produce spores. • Seed plants have vascular tissue and seeds. • Plants have complex life cycles that include	1. What is a plant? 2. Classifying plants 3. Plant structures 4. Plant reproduction 5. Plant responses and growth 6. Plants in everyday life.	• What characteristics do all plants share? • What do plants need to live successfully on land? • What are the characteristics of nonvascular plants? • What are the characteristics of seedless vascular plants? • What are the characteristics of seed plants? • What are the functions of roots, stems, and leaves? • How do seeds become new plants? • What are the structures of a flower? • What are the stages of a plant life cycle? • How do plants reproduce? • What are three stimuli that produce plant responses? • How do plants respond to seasonal changes?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.3 Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and protista). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Identify the characteristics that all plants share. • Name all things that a plant needs to successfully live on land. • Name the major characteristics of a nonvascular plants. • Name the major characteristics of seedless vascular plants. • Name the major characteristics of seed plants. • Describe the function of roots, stems, and leaves. • Explain how seeds become new plants. • Describe the structure of a flower. • Identify the stages of a plant's life cycle. • Describe how plants reproduce. • Identify three stimuli that produce plant responses. • Describe how plants respond to seasonal changes. • Explain how plants are important in everyday life.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

	a sporophyte stage and a gametophyte stage. • All plants undergo sexual reproduction that involves fertilization.		• How are plants important to everyday life?				
Chapter 9 Introduction to Animals (2 weeks)	• The main functions of an animal are to obtain food and oxygen, keep internal conditions stable, move in some way, and reproduce. • Animals are classified according to how they are related to other animals. These relationships are determined by an animal's body structure, the way the animal develops, and its DNA. • The organization of an animal's cells into higher levels of structure helps to describe an animal's body plan. • Animals without symmetry have no tissues. Animals with radial symmetry have tissues and usually have organ systems. Animals with bilateral symmetry have organ systems. • Animals that do not have backbones are invertebrates. • At some point in their lives, all chordates have three characteristics: a notochord, a nerve cord, and pouches in the throat area. • The body temperatures of some	1. What is an animal? 2. Animal body plans 3. Into to invertebrates 4. Intro to vertebrates 5. Vertebrate diversity.	• What are the functions of animals? • How are animals classified? • What are the functions of animals? • How are animals classified? • What are invertebrates? • What are characteristics of chordates and vertebrates? • How do vertebrates control body temperature? • What are the major group of vertebrates?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.3 Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and Protista). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Identify four functions that allow animals to meet their basic needs. • Explain how animals are classified. • Describe levels of organization in animal bodies. • Infer animal body structures based on their symmetry. • Identify the characteristics of invertebrates and describe the major groups of them. • Identify the characteristics of chordates and vertebrates. • Compare how vertebrates differ in the way they control their body temperature. • Describe the major group of vertebrates.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

	vertebrates change with the environment. Other vertebrates maintain a constant body temperature. • There are five major groups of vertebrates. They are fishes, amphibians, reptiles, birds, and mammals.						
Chapter 10 Animal Life Processes (3.5 weeks)	• A skeleton is a framework that shapes and supports an animal, protects its internal organs, and allow it to move in its environment. • Muscles help animals move their body parts. • A nervous system allows animals to detect, process, and react to environmental signals. • The simplest nervous systems are a netlike arrangement of neurons throughout the body. Complex systems have a nerve cord and a brain. • An animal moves about when its nervous system, muscular system, and skeletal system work together to make movement happen. • Animals that live in water, on land, or in the air have different adaptations for movement. • The different ways that an animal obtains energy depends on what and how it eats. • Animal cells exchange oxygen and carbon dioxide with	1. Skeletons and muscles 2. The nervous system 3. Animal movement 4. Obtaining energy 5. Animal reproduction and fertilization 6. Animal development and growth	• What supports and protects animal bodies? • What is the role of muscles? • What is the role of the nervous system? • How do nervous systems differ? • What causes animals to move? • How do adaptations for movement compare? • How do animals obtain and digest food? • How do animals obtain oxygen? • What are the two types of circulatory systems? • How do animals reproduce? • How do external and internal	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Describe the framework for support and protection of animal bodies. • Explain the role of muscles in animal bodies. • Explain the function of the nervous system. • Compare how the nervous systems of animals differ. • Explain how muscles, the skeleton, and the nervous system interact to allow animal movement. • Compare the adaptations in organisms that allow them to move in specific environments. • Identify the different ways animals obtain and digest food. • Explain how animals exchange oxygen and carbon dioxide with the environment. • Describe the two types of	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

	their surroundings by diffusion. • Complex animals have one of two types of circulatory systems; open or closed. • Animals undergo either asexual or sexual reproduction to make more of their own kind. • External fertilization occurs outside of the female's body, and internal fertilization occurs inside the female's body. • The growing of offspring, or embryo, may develop outside or inside of the parent's body. • Young animals undergo changes in their bodies between birth and maturity. • Most amphibians and reptiles do not provide parental care. Most birds and mammals do.		fertilization differ? • How do embryos develop? • How do young animals develop? • How do animals care for their young?		circulatory system. • Compare asexual and sexual reproduction in invertebrates and vertebrates. • Explain how external fertilization and internal fertilization differ. • Compare and contrast embryonic development in different vertebrates. • Describe life cycles of vertebrates and invertebrates. • Describe how different vertebrates care for their young.		
Chapter 11 Introduction to the Human Body (3 weeks)	• The levels of organization in the human body consists of cells, tissues, organs, and organ systems. • Muscles, bones, and nerves work together to make your body move. • The circulatory, respiratory, digestive, and excretory systems play key roles in moving materials in your body. • The nervous system and the endocrine system work together	1. Body organization 2. System interactions 3. Homeostasis 4. Skeletal system 5. Muscular system 6. Skin	• How is your body organized? • How do you move? • Which systems move materials in your body? • Which systems control body functions? • How does your body stay in balance? • What does the skeleton do?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which	• List the levels of organization in the body. • Describe how the skeletal and muscular systems work together. • Describe which body systems work together to obtain and transport materials. • Describe which body systems are responsible for communication and regulation.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment	Daily assessments End of chapter exams Labs and Projects

	to control body functions. • All of your body systems working together maintain homeostasis and keep the body in balance. • Your skeleton provides shape and support, enables you to move, protects your organs, produces blood cells, and stores minerals. • Joints allow bones to move in different ways. • Bones are complex living structures that grow, develop, and repair themselves. • Your body has skeletal, smooth, and cardiac muscle tissues. Some of these muscles tissues are involuntary, and some are voluntary. • Skeletal muscles work in pairs. Muscle cells only contract, not lengthen. While one muscle in a pair contracts, the other muscle relaxes. • The skin has two layers that protect the body. Skin helps regulate body temperature, eliminate wastes, and produce vitamin D.		• What role do joints play? • What are the characteristics of bones? • What muscles are in your body? • How do skeletal muscles work? • What are the functions and structures of the skin?	underlie larger systems, enable the system to function as a whole.	• Define homeostasis and explain how systems interact to maintain homeostasis. • Identify the functions of the skeleton. • Explain the role the joints play in the body. • Describe the characteristics of bones and how to keep bones strong and healthy. • Identify the types of muscles found in the body. • Explain how skeletal muscles work in pairs. • Define the functions and structures of the skin.	when applicable.	
Chapter 12 Managing Materials in the Body (2.5 weeks)	• Food provides your body with materials for growth and repair. It also provides energy. • The digestive system breaks down food,	1. Digestion 2. The Circulatory system 3. The respiratory system 4. Excretion.	• Why do you need food? • What happens in your digestive system? • What happens in	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2	• Explain why the body needs food and what nutrients it uses. • Describe the structures and functions of the	Students will be given the following: Preferential seating when applicable Study guides	Daily assessments End of chapter exams

	absorbs nutrients, and eliminates waste. • Substances produced by the liver, pancreas, and lining of the small intestine help to complete chemical digestion. • The circulatory system delivers substances to cells, carries wastes away, and regulates body temperature. Blood cells fight disease. • Blood has four components; plasma, red blood cells, white blood cells, and platelets. • Your respiratory system moves air containing oxygen into your lungs and removes carbon dioxide and water from your body. Your lungs and the structures that lead to them make up your respitory system. • When you breathe, your rib muscles and diaphragm work together, causing air to move into or out of your lungs. • The excretory system collects the wastes that cells produce and removes them from the body. • Excretion helps maintain homeostasis by keeping the body's internal environment stable and free of harmful levels of chemicals.		your circulatory system? • What does blood contain? • What is the role of the respiratory system? • What happens when you breathe? • What is the role of the excretory system? • How does excretion help your body maintain homeostasis?	Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	digestive system. • Describe the structures and functions of the cardiovascular system. • Describe the characteristics of blood. • Identify the structures and functions of the repertory system. • Explain what happens during breathing and gas exchange. • Identify the structures and functions of the excretory system. • Explain how excretion contributes to homeostasis.	Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Labs and Projects

Chapter 13 Controlling Body Processes (2.25 weeks)	• Your nervous system information about what is happening both inside and outside your body. It directs how your body responds to this information and helps maintain homeostasis. • Neurons carry nerve impulses throughout the body. The brain is the control center of the central nervous system. The spinal cord links the brain to the peripheral nervous system. • Your eyes, ears, nose, mouth, and skin are specialized sense organs that enable you to get information from the outside world. • The endocrine system regulates short-term and long-term activities by sending chemicals throughout the body. Long-term changes include growth and development. • When the amount of hormone in the blood reaches a certain level, the endocrine system sends signals that stop the release of that hormone. • The male reproductive system produces sperm and testosterone. The female reproductive system produces eggs and estrogen. It also nourishes a	1. The nervous system 2. The endocrine system 3. The male and female reproductive systems 4. Pregnancy and birth.	• What is the role of the nervous system? • How do the parts of your nervous system work? • What do your senses do? • How does the endocrine system function? • What controls hormone levels? • What are the functions of the reproductive systems? • What happens during the menstrual cycle? • What happens before birth? • How is the embryo protected and nourished? • What happens during childbirth	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Identify the functions of the nervous system. • Describe the parts of the nervous system and how each part functions. • Describe how your senses work. • Describe how the glands of the endocrine system control body systems. • Explain how negative feedback controls hormone levels. • Describe the structures and functions of the male and female reproductive system. • Sequence the events of the menstrual cycle. • List the stages of human development that occur before birth. • Explain how a developing embryo is protected and nourished. • Describe what happens during childbirth.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

	developing baby until birth. • Before birth, the zygote develops first into an embryo and then into a fetus. • The membranes and structures that form in the uterus during pregnancy protect and nourish the developing baby. • The birth of a baby takes place in three stages; labor, delivery, and afterbirth.						
Chapter 14 Fighting Disease (2.5 weeks)	• When you have an infectious disease, pathogens are in your body causing harm. • The four major types of human pathogens are bacteria, viruses, fungi, and protists. They can be spread through contact with a sick person, other living things, or an object in the environment. • The first line of defense is your outer coverings, which trap and kill most pathogens. • In the inflammatory response, fluid and white blood cells fight pathogens in nearby tissues. In the immune response, cells in the blood and tissues target each kind of pathogen. • HIV is the only kind of virus known to attack the human immune system directly and destroy T cells.	1. Infectious disease 2. The body's defenses 3. HIV and AIDS 4. Infectious disease and your health 5. Noninfectious disease.	• How do pathogens cause disease? • What pathogens cause infectious disease and how are they spread? • What is the body's first line of defense? • What are the inflammatory and immune responses? • How does HIV affect the body? • How is HIV spread and treated? • How can you become immune? • How can infectious diseases be treated and prevented?	S8.B.1.1.1 Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics). S8.B.1.1.2 Compare similarities and differences in internal structures of organisms (e.g., invertebrate/vertebrate, vascular/nonvascular, single celled/ multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	• Describe the relationship between pathogens and infectious disease. • Identify the pathogens that cause infectious diseases in humans and how they spread. • Explain how the body's first line of defense guards against pathogens. • Describe how the inflammatory response and the immune response function. • Identify how HIV affects the body. • Describe how HIV spreads and how it is treated. • Distinguish between kinds of immunity and tell how	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for assignment when needed Separate testing environment when applicable.	Daily assessments End of chapter exams Labs and Projects

	• HIV can spread from one person to another if body fluids from an infected person come in contact with body fluids of an uninfected person. • You acquire active immunity when your own immune system produces antibodies. You acquire passive immunity when the antibodies come from a source outside your body. • Bacterial diseases can be treated with medications. Viral diseases have no known cure. • Allergies cause an inflammatory response by the body. Asthma affects breathing, while diabetes affects how body cells take up glucose. • Cancer is a disease in which cells multiply uncontrollably, destroying healthy tissue. Treatments include surgery, radiation, and drugs.		• How do allergies, asthma, and diabetes affect the body? • What is cancer and how can it be treated?		immunity is acquired. • Describe methods for treating and preventing infectious disease.		
Chapter 15 Populations and Communities (2 weeks)	• An organism gets the things it needs to live, grow, and reproduce from its environment. • Biotic and abiotic factors make up a habitat. • The levels of organization in an ecosystem are organism, population, and community. • Populations can change in size when new members join the	1. Living things and the environment 2. Populations 3. Interactions between living things 4. Changes in communities	• What does an organism get from its environment? • What are the two parts of an organism's habitat? • How is an ecosystem organized? • How do populations change in size?	S8.B.3.1 Explain the relationships among and between organisms in different ecosystems and their abiotic and biotic components S8.B.3.1.1 Explain the flow of energy through an ecosystem (e.g., food chains, food webs). S8.B.3.1.1a Sequence the flow of energy through a food chain or a food web.	• Identify the needs that must be met by an organism's surroundings. • Identify biotic and abiotic parts of a habitat. • Describe the levels of organization within an ecosystem.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable	Daily assessments End of chapter exams Labs and Projects

	population or when members leave the population. • Some limiting factors for populations are weather conditions, space, food, and water. • Every organism has a variety of adaptations that are suited to its specific living conditions to help it survive. • Two major types of interactions among organisms are competition and predation. • The three main types of symbiotic relationships are mutualism, commensalism, and parasitism. • Unlike primary succession, secondary succession occurs in a place where an ecosystem currently exists.		• What factors limit population growth? • How do adaptations help an organism survive? • What are competition and predation? • What are the three types of symbiosis? • How do primary and secondary succession differ?	Alternate Eligible Content is designed for students assessed using the PA Alternate System of Assessment (PASA). S8.B.3.1.2 Identify major biomes and describe abiotic and biotic components (e.g., abiotic: different soil types, air, water sunlight; biotic: soil microbes, decomposers). S8.B.3.1.2a Recognize the association between different environments and their characteristics (e.g., climate, precipitation, vegetation.) Alternate Eligible Content is designed for students assessed using the PA Alternate System of Assessment (PASA). S8.B.3.1.3 Explain relationships among organisms (e.g., producers/consumers, predator/prey) in an ecosystem. S8.B.3.1.3a Identify the role of different organisms in an ecosystem (limited to producers, consumers, predator, and prey.) Alternate Eligible Content is designed for students assessed using the PA Alternate System of Assessment (PASA).	• Describe how populations change in size. • Identify the factors that limit population growth. • Explain how adaptations help an organism survive. • Describe competition and predation. • Identify three types of symbiosis. • Explain the difference between primary and secondary succession.	Extended time for assignment when needed Separate testing environment when applicable.	
Chapter 16 Ecosystems and Biomes (2.25 weeks)	• Each of the organisms in an ecosystem fills the energy role of producer, consumer, or decomposer. • Energy moves through an ecosystem when one organism eats another. • The most energy is available at the producer level of the pyramid. As energy moves up the	1. Energy flow in ecosystems 2. Cycles of matter 3. Biomes 4. Aquatic ecosystems 5. Biodiversity.	• What are the energy roles in an ecosystem? • How does energy move through an ecosystem? • What processes are involved in the water cycle? • How are the carbon and	S8.B.3.2 Identify evidence of change to infer and explain the ways different variables may affect change in natural or human-made systems. S8.B.3.2.1 Use evidence to explain factors that affect changes in populations (e.g., deforestation, disease, land use, natural disaster, and invasive species). S8.B.3.2.2 Use evidence to explain how diversity affects the ecological integrity of natural systems.	• Name and describe energy roles that organisms play in an ecosystem. • Explain how energy moves through an ecosystem. • Name and describe processes involved in the water cycle.	Students will be given the following: Preferential seating when applicable Study guides Guided notes when applicable Extended time for	Daily assessments End of chapter exams Labs and Projects

	pyramid, each level has less energy available than the level below. • The processes of evaporation, condensation, and precipitation make up the water cycle. • The processes by which carbon and oxygen are recycled are linked. Producers, consumers, and decomposers play roles in recycling both. • Nitrogen moves from the air into the soil, into living things, and back into the air or soil. • The six major biomes are desert, rain forest, grassland, deciduous forest, boreal forest, and tundra. • There are two types of aquatic ecosystems; freshwater and marine. • Biodiversity has both economic value and ecological value within an ecosystem. • Factors that affect biodiversity in an ecosystem include climate, area, niche diversity, genetic diversity, and extinction. • Biodiversity can be negatively or positively affected by the actions of humans.		oxygen cycles related? • How does nitrogen cycle through ecosystems? • What are the six major biomes? • What are the two major aquatic ecosystems? • What is biodiversity's value? • What factors affect biodiversity? • How do humans affect biodiversity?	S8.B.3.2.3 Describe the response of organisms to environmental changes (e.g., changes in climate, hibernation, migration, coloration) and how those changes affect survival. S8.B.3.3 Explain how renewable and nonrenewable resources provide for human needs or how these needs impact the environment. S8.B.3.3.1 Explain how human activities may affect local, regional, and global environments. S8.B.3.3.2 Explain how renewable and nonrenewable resources provide for human needs (i.e., energy, food, water, clothing, and shelter). S8.B.3.3.3 Describe how waste management affects the environment (e.g., recycling, composting, landfills, incineration, sewage treatment). S8.B.3.3.4 Explain the long-term effects of using integrated pest management (e.g., herbicides, natural predators, biogenetics) on the environment.	• Explain how the carbon and oxygen cycles are related. • Define and describe the oxygen cycle. • Name the six major biomes found on Earth. • Name and describe the two major types of aquatic systems. • Explain the value of biodiversity. • Identify the factors that affect biodiversity. • Identify ways that human activity threatens and protects biodiversity.	assignment when needed Separate testing environment when applicable.	