Unit	Lesson	Lesson Objectives
Ecology		
	The Cycles of Matter	
		Demonstrate the importance of water, carbon, nitrogen, and phosphorus in ecosystems.
		Describe how water, carbon, nitrogen, and phosphorus are cycled through ecosystems.
		Science Practice: Compare the economic, human, and environmental losses to the benefits of a specific scientific example.
	Organizational Hierarchy	
		Describe how organisms, populations, communities, ecosystems, and biomes are related.
		Describe the hierarchy of organisms, populations, communities, ecosystems, and biomes.
		Science Practice: Examine the economic, societal, and environmental impacts of a real-world example.
	Relationships Among Organisms	
		Describe the five major types of interactions between organisms.
		Examine how symbiotic relationships can create dependency among species.
		Explain how invasive species affect the environment they occupy.
		Science Practice: Describe various ways evidence can be interpreted or explained.
	Energy Flow in Ecosystems	
		Distinguish between producers, consumers, and decomposers.
		Explain the energy flow in a food web.
		Illustrate the flow of energy through an ecosystem.
		Science Practice: Locate data on a table and relate that data to a corresponding graph.
	Succession and Extinction	
		Assess the importance of biodiversity in an ecosystem.
		Identify and explain the stages of succession in an ecosystem.
		Identify factors that may disturb ecosystem stability.
		Science Practice: Locate data on a table and relate that data to a corresponding graph.
	Populations and the Environment	
		Compare and contrast positive and negative interactions between organisms and their environment.
		Demonstrate how an organism's habitat determines its niche.
		Determine biotic and abiotic factors within an ecosystem.
		Science Practice: Distinguish between and give examples of observation and inference.
	Population Size and Structure	
		Describe the limiting factors that affect a population in a given environment.
		Differentiate between density-dependent and density-independent factors.
		Explain how birth rate, death rate, immigration, and emigration affect population size.
		Science Practice: Evaluate the impact of science and technology on society.

Unit	Lesson	Lesson Objectives
	Population Growth	
		Compare and contrast exponential and logistic growth models.
		Determine factors that influence a species' carrying capacity.
		Identify factors that affect population growth.
		Science Practice: Predict trends and outcomes based on a given set of data.
	Human Impact on the Environment	
		Analyze how human populations affect resources.
		Give examples of human activities that have been beneficial and detrimental to the environment.
		Relate the greenhouse effect to global warming and explain its impact on the environment.
		Science Practice: Give examples of science contributions impacting sustainability.
The Building Blocks of Life		
	Characteristics of Life	
		Compare and contrast living and nonliving objects.
		Describe the characteristics of living organisms.
		List the levels of organization within a living organism in hierarchical order.
		Science Practice: Examine how two different scientists could use different experimental designs and have the same outcome.
	Elements of Living Organisms	
		Differentiate between elements and compounds.
		Identify the six most common elements found in living organisms.
		Illustrate the importance of the six most common elements to living organisms.
		Science Practice: Demonstrate how to read a Material Safety Data Sheet (MSDS).
	Carbohydrates	
		Compare the structures of monosaccharides, disaccharides, and polysaccharides.
		Differentiate between the roles of monosaccharides, disaccharides, and polysaccharides in living organisms.
		Identify the role of carbohydrates in living organisms.
		Science Practice: Construct charts, graphs, and tables to organize data.
	Lipids	
		Compare and contrast the structures of saturated and unsaturated lipids.
		Explain the roles of lipids within living organisms.
		Science Practice: Evaluate data to formulate a conclusion.

Unit	Lesson	Lesson Objectives
	Proteins and Nucleic Acids	
		Explain the roles of proteins and nucleic acids in living organisms.
		Identify the components of proteins and nucleic acids and discuss how they were discovered.
		Recognize essential amino acids found in living organisms.
		Science Practice: Evaluate the impact of science and technology on society.
	Catalysts	
		Describe the "lock and key" mechanism of enzymes in chemical reactions.
		Explain how catalysts affect the energy of a chemical reaction.
		Relate changes in energy to the rate of a chemical reaction.
		Science Practice: Create a laboratory experiment to answer a specific question.
	Lab: Identifying Nutrients	
		Describe nutrients found in common foods such as bread, meat, juice, oil, and milk.
		Identify carbohydrates, lipids, and proteins found in food samples by conducting chemical tests.
		Science Practice: Discuss how to apply safe practices during a lab and/or field investigation.
Cell Biology		
	The Function of Organelles	
		Describe the functions of each organelle.
		Identify the organelles of a cell.
		Science Practice: Construct charts, graphs, and tables to organize data.
	Animal and Plant Cells	
		Compare and contrast the structures of animal and plant cells.
		Differentiate between the cell membrane and the cell wall.
		Science Practice: Construct charts, graphs, and tables to organize data.
	ATP	
		Describe the role of ATP in living organisms other than plants.
		Describe the role of ATP in plant processes.
		Identify ATP as a source of energy for living organisms.
		Science Practice: Evaluate data to formulate a conclusion.
	Light Dependent Reactions in Photosynthesis	
		Outline the steps of the light-dependent reactions in photosynthesis.
		Science Practice: Distinguish between and give examples of observation and inference.

Unit	Lesson	Lesson Objectives
	Light Independent Reactions in Photosynthesis	
		Compare and contrast the light-dependent and the light-independent reactions of photosynthesis.
		Outline the steps of the light-independent reactions in photosynthesis.
		Science Practice: Apply the scientific method to given scenarios.
	Cellular Respiration	
		Compare and contrast aerobic and anaerobic cellular respiration.
		Describe how cellular respiration converts glucose to energy in the form of ATP.
		Explain the importance of cellular respiration to living organisms.
		Science Practice: Organize data using specific grouping methods.
Cellular Processes		
	Cell Theory	
		Compare and contrast the functions of different types of microscopes.
		Describe the components of cell theory.
		Examine the role of microscopes in discovering cells.
		Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.
	Prokaryotic and Eukaryotic Cells	
		Compare and contrast prokaryotic and eukaryotic cells.
		Describe the basic structure of a cell.
		Explain the endosymbiotic theory.
		Science Practice: Evaluate past research from investigations similar in design and purpose.
	Cell Homeostasis	
		Describe the importance of homeostasis to living organisms.
		Differentiate between diffusion, osmosis, passive transport, and active transport.
		Explain how cells maintain homeostasis.
		Science Practice: Generate procedures to utilize charts, graphs, and tables to show data.
	Mitosis	
		Describe the steps of mitosis.
		Explain the importance of mitosis to living organisms.
		Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.
	Meiosis	
		Describe the roles of crossing over and independent assortment in meiosis.
		Explain the importance of meiosis to living organisms.
		Illustrate the steps of meiosis.
		Science Practice: Examine how a scientist's creativity can lead to scientific discovery.

Unit	Lesson	Lesson Objectives
	Asexual and Sexual Reproduction	
		Compare and contrast sexual and asexual reproduction.
		Differentiate between mitosis and meiosis.
		Relate the processes of mitosis and meiosis to reproduction.
		Science Practice: Outline how to formulate scientific questions using reproduction as a model.
	Cell Differentiation and Specialization	
		Analyze the effect of changing external conditions on specialized cells.
		Describe specialized cells found within living organisms.
		Explain the role of differentiation in the creation of specialized cells.
		Science Practice: Examine how two different scientists could use different experimental designs and have the same outcome.
Molecular Genetics		
	Genetic Code	
		Describe the relationship between DNA, genes, and chromosomes.
		Describe the role of DNA replication in transmitting genetic information.
		Science Practice: Evaluate the impact of science and technology on society.
		Summarize the experiments that led to the discovery of the genetic code.
	DNA and RNA Structure	
		Analyze the similarities and differences between DNA and RNA.
		Explain how the base pairing in DNA and RNA was discovered.
		Science Practice: Give examples of how research affects science, society, and the environment.
	Protein Synthesis	
		Explain the relationship between transcription and gene expression.
		Explain the relationship between translation and gene expression.
		Science Practice: Give examples of how hypotheses lead to new experimental methods.
	Lab: Building Proteins from RNA	
		Demonstrate how base pairing builds proteins from RNA.
		Describe the role of RNA in the creation of proteins.
		Science Practice: Conduct a laboratory experiment to answer a specific question.
	DNA Mutations	
		Analyze the effect of harmful environmental factors on DNA.
		Describe common types of DNA mutations.
		Explain the effects of DNA mutations on the characteristics of living organisms.
		Science Practice: Discriminate scientific claims that are socially accepted but not scientifically based.

Unit	Lesson	Lesson Objectives
	Chromosomes	
		Create and label a diagram of homologous chromosome pairs with heterozygous alleles.
		Explain how a karyotype can be used to identify genetic defects.
		Illustrate the structure of a chromosome and its relationship to DNA.
		Science Practice: Apply the components of a scientific report.
Heredity		
	Introduction to Genetics	
		Describe the role of nucleic acids in transmitting genetic information.
		Explain the importance of Gregor Mendel to the field of genetics.
		Science Practice: Give examples of how hypotheses lead to new experimental methods.
	Probability of Inheritance	
		Determine genotype and phenotype probabilities from Punnett squares.
		Predict possible allele combinations of offspring based on the genetics of the parent.
		Science Practice: Explain how changing the variables, methods, and timing impacts scientific investigation.
		Use Punnett squares to create monohybrid and dihybrid crosses.
	Laws of Inheritance	
		Apply the law of independent assortment.
		Describe how the principle of dominance applies to genes.
		Science Practice: Differentiate scientific hypotheses, theories, and laws.
		Summarize the law of segregation.
	Lab: Mouse Genetics (One Trait)	
		Demonstrate how dominant and recessive alleles are passed from parents to offspring.
		Science Practice: Evaluate data to formulate a conclusion.
		Use the laws of inheritance to breed mice with desired genotypes for fur color.
	Non-Mendelian Inheritance	
		Analyze examples of polygenic traits.
		Differentiate between incomplete dominance and codominance.
		Explain how blood type is determined.
		Science Practice: Assess how science and society impact each other.
	Sex-linked Inheritance	
		Analyze a pedigree to determine sex-linked traits.
		Science Practice: Give examples of how research affects science, society, and the environment.
		Summarize the process of sex-linked inheritance.

Unit	Lesson	Lesson Objectives
	Lab: Mouse Genetics (Two Traits)	
		Demonstrate how alleles are passed independently of one another.
		Science Practice: Evaluate data to formulate a conclusion.
		Use the laws of inheritance to describe how two separate traits are inherited in an organism.
Evolution of Life		
	Darwin's Theory	
		Explain how natural selection acts as a mechanism of evolution.
		Science Practice: Describe how scientific investigations lead to new scientific questions.
		Summarize the main points of Darwin's theory.
		Summarize the major concepts of natural selection.
	Factors Affecting Genetic Variation	
		Describe genetic drift and gene flow as mechanisms of evolution.
		Give examples of how environmental factors affect genetic variation and influence natural selection.
		Science Practice: Predict trends and outcomes based on a given set of data.
	Lab: Natural Selection	
		Identify natural selection as a mechanism for the evolution of a population.
		Science Practice: Decide whether specific questions can be answered using scientific investigation.
	Hardy-Weinberg Principle	
		Identify the conditions that are necessary for a population to be in Hardy-Weinberg equilibrium.
		Science Practice: Describe how scientific investigations lead to new scientific questions.
		Use the Hardy-Weinberg equation to predict the frequency of genotypes in a population given the frequency of phenotypes.
	Factors Affecting Biological Diversity	
		Examine how directional, disruptive, and stabilizing selection affect biological diversity.
		Explain how new or varied species originate via natural selection.
		Science Practice: Judge claims made by scientific explanations, data, or arguments.
	Biogeographic Isolation	
		Analyze how new species are formed by reproductive and geographic isolation.
		Analyze the relationship between biogeographic isolation and the theory of evolution.
		Explain the concept of biogeographic isolation.
		Science Practice: Give examples of how hypotheses lead to new experimental methods.

Unit	Lesson	Lesson Objectives
	Biological Evidence and the Fossil Record	
		Assess the comparative anatomies among organisms.
		Describe how the fossil record shows common ancestry between organisms.
		Distinguish scientific evidence that supports the theory of evolution.
		Science Practice: Explain the role of scientific argumentation in evaluating the validity of data, claims, hypotheses, and observations.
	Evolutionary Relationships	
		Analyze the relationships among organisms based on a variety of shared characteristics.
		Explain how understanding evolutionary history impacts classification of organisms.
		Interpret evolutionary relationships among organisms on a cladogram.
		Science Practice: Describe various ways evidence can be interpreted or explained.
	Human Evolution	
		Discuss specific hominid fossils that were key to understanding the evolution of modern humans.
		Science Practice: Inspect resources for valid information to use in research.
		Summarize how the anatomy of humans has changed over time from scientific evidence.
Taxonomy		
	Methods of Classification	
		Describe how organisms are classified.
		Explain reasons why systems of classification may change.
		Explain the purpose of biological taxonomy.
		Science Practice: Organize data using specific grouping methods.
	The Kingdoms	
		Compare characteristics of taxonomic groups.
		Distinguish the six kingdoms of living organisms.
		Science Practice: Organize data using specific grouping methods.
		Summarize the levels of biological classification.
	Types of Plants	
		Differentiate between gymnosperms and angiosperms.
		Distinguish ways that plants are grouped.
		Science Practice: Organize data using specific grouping methods.
		Summarize the origin and evolution of land plants.

Unit	Lesson	Lesson Objectives
	Plant Structures	
		Describe the interactions among plant systems that allow transport, reproduction, and response.
		Identify the three types of plant tissue.
		Relate the structures of major plant organs and tissues to their functions.
		Science Practice: Give examples of how research affects science, society, and the environment.
	Protists and Fungi	
		Characterize the three common types of protists.
		Distinguish between the five phyla of fungi.
		Relate the structures found in protists and fungi to their functions.
		Science Practice: Show how scientific evidence can affect societal decisions.
	Bacteria	
		Characterize three common forms of bacteria.
		Compare modes of bacterial reproduction.
		Explain how bacteria infects other organisms.
		Science Practice: Examine the contributions of scientists from various scientific disciplines.
	Viruses	
		Compare the structure of a virus to a cell.
		Describe how the structure of a virus contributes to its ability to cause infection.
		Differentiate between the lytic and lysogenic cycles of viral reproduction.
		Science Practice: Use scientific evidence to support an argument.
	Identifying Unknown Organisms	
		Describe the purpose for using a dichotomous key.
		Explain the process of identifying an organism using a dichotomous key.
		Science Practice: Distinguish between and give examples of observation and inference.
Human Body I		
	Types of Tissue	
		Describe the role of skin.
		Differentiate the four types of human tissue.
		Explain the functions of each type of human tissue.
		Science Practice: Give examples of how research affects science, society, and the environment.

Unit	Lesson	Lesson Objectives
	The Human Skeleton	
		Describe the functions of the skeletal system.
		Differentiate between the axial and appendicular skeleton.
		Illustrate bone markings and joint types.
		Science Practice: Compare and contrast different scientific disciplines.
	Muscle Structure and Function	
		Describe the physiological process of a muscle contraction.
		Differentiate skeletal, smooth, and cardiac muscles by structure and function.
		Illustrate the major structures and functions of the muscular system.
		Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.
	The Endocrine and Exocrine Systems	
		Describe the role of hormones in maintaining homeostasis.
		Explain the functions of the endocrine and exocrine systems.
		Illustrate the different structures of the endocrine and exocrine systems.
		Science Practice: Conduct research using a variety of sources.
	The Central Nervous System	
		Examine the different parts of the brain and spinal cord, and their functions.
		Illustrate the major structures and functions of the central nervous system.
		Science Practice: Describe various ways evidence can be interpreted or explained.
	The Peripheral Nervous System	
		Identify the major functions associated with the sympathetic and parasympathetic nervous systems.
		Identify the roles of sensory neurons, interneurons, and motor neurons.
		Illustrate the major structures and functions of the peripheral nervous system.
		Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.
	Nerve Conduction	
		Explain a synapse.
		Identify the parts of a reflex arc.
		Science Practice: Give examples of how hypotheses lead to new experimental methods.
		Use a diagram of a neuron to analyze a nerve impulse.
	The Cardiovascular System	
		Explain the functions of the cardiovascular system.
		Identify factors that affect blood flow.
		Illustrate structures of the cardiovascular system, including the anatomical structure of the heart.
		Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.

Unit	Lesson	Lesson Objectives
	Blood	
		Analyze the clotting mechanism of blood.
		Compare blood types.
		Examine the different components of blood.
		Science Practice: Examine how a scientist's creativity can lead to scientific discovery.
	Lab: Blood Typing	
		Demonstrate how blood clots are formed.
		Identify blood types based on blood-clotting factors.
		Science Practice: Discuss how to apply safe practices during a lab and/or field investigation.
Human Body II		
	The Respiratory System	
		Explain the functions of the respiratory system.
		Illustrate the different structures of the respiratory system.
		Science Practice: Give examples of the positive and negative impacts of science on society.
	The Digestive System	
		Explain the functions of the digestive system.
		Identify the different structures of the digestive system.
		Identify the functions and secretion sites of different digestive enzymes.
		Science Practice: Predict trends and outcomes based on a given set of data.
	The Excretory System	
		Explain the functions of the excretory system.
		Illustrate the different structures of the excretory system.
		Science Practice: Describe the characteristics of science and its methods.
	The Reproductive System	
		Investigate the structures and functions of the female reproductive system.
		Investigate the structures and functions of the male reproductive system.
		Science Practice: Evaluate data to formulate a conclusion.
	The Reproductive Process	
		Describe egg and sperm formation.
		Describe the process of human development from fertilization to birth.
		Science Practice: Show how scientific evidence can affect societal decisions.

Unit	Lesson	Lesson Objectives
	The Immune System	
		Describe immune responses.
		Explain why an individual with a compromised immune system may not be able to fight infection.
		Identify the components that contribute to immune responses.
		Science Practice: Discriminate scientific claims that are socially accepted but not scientifically based.
	Human Health	
		Describe the germ theory of disease.
		Examine how people's genetic makeup or environmental conditions can contribute to their susceptibility to diseases.
		Explain how diseases are spread.
		Science Practice: Evaluate the impact of science and technology on society.