BIOLOGY CURRICULUM

Course 18003

Students in Biology will learn the basic principles of Biology as outlined in the PA Academic Standards for Biology. Students will develop scientific process skills and an understanding of the fundamental principles of living organisms. Topics to be covered include: basic biological and scientific principles, chemistry of life, cell structure and function, cells and cell processes, cell growth and division, genetics, the theory of evolution, and the various systems of the human organism. At the completion of this course, students will take the Keystone Biology Exam.

BIOLOGY OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
• Explain the characteristics common to all organisms. • Identify and describe the cell structures and the various life processes they are involved with. • Explain mechanisms that permit organisms to maintain homeostasis. • Describe the three stages of the cell cycle: interphase, nuclear division, and cytokinesis. • Explain how genetic information is expressed. • Explain the mechanisms of evolution. • Describe the structures and processes of each of the major systems of the human organism.	• Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules). • Apply scientific thinking, processes, tools, and technologies in the study of biologic sciences.	Chapter Tests Keystone Biology Exam	1-year	Holt McDougal Biology

BIOLOGY MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Unit 1 (Intro to Biology) - Biology in the 21st Century (Weeks 1-2)	• Biologists study life in all its forms. • Unifying themes connect concepts from many fields of biology. • Science is a way of thinking, questioning, and gathering evidence. • Technology continually changes the way biologists work. • Understanding biology can help you make informed decisions.	1. Earth is home to an incredible diversity of life. 2. All organisms share certain characteristics. 3. All levels of life have systems of related parts. 4. Structure and function are related in biology. 5. Organisms must maintain homeostasis to survive in diverse environments. 6. Evolution explains the unity and diversity of life. 7. Like all science, biology is a process of inquiry. 8. Biologists use experiments to test hypotheses. 9. A theory explains a wide range of observation. 10. Imagining technologies provide new views of life. 11. Complex systems are modeled on computers. 12. The tools of molecular genetics give rise to new	• How would you recognize a biologist? • List the many different fields in biology. • How could you develop a hypothesis? • How is technology used by biologists? • Elaborate on how your health and biology is related?	3.1.10.A1 Explain the characteristics of life common to all organisms. 3.1.10.A9 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements. 3.1.10.B6 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements. 3.1.10.C1	• Define and give examples of Earth's biodiversity. • Summarize the characteristics that all living things share. • Summarize four major unifying themes of biology. • Give an example of each of the themes of biology. • Identify the different elements of scientific inquiry. • Differentiate between theories and hypothesis. • Describe the usefulness of modern imaging technologies, • Explain the usefulness of computer models in studying biological systems. • Summarize how modern computer-based technologies have advanced the study of genetics. • Evaluate the importance of biology in making informed decisions. • Summarize the benefits and risks of the application of biotechnology.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		biological studies. 13. Your health and the health of the environment depend on your knowledge of biology. 14. Biotechnology offers great promise but also raises many issues. 15. Biology presents many unanswered questions.		Explain the mechanisms of biological evolution. 3.1.10.C4 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements.	• Explain how advances in technology might affect the future of biology.		
Unit 1 (Intro to Biology) - Chemistry of Life (Weeks 3-4)	• All living things are based on atoms and their interactions. • Water's unique properties allow life to exist on Earth. • Carbon-based molecules are the foundation of life. • Life depends on chemical reactions. • Enzymes are catalysts for chemical reaction in living things.	1. Living things consists of atoms of different elements. 2. Ions form when atoms gain and lose electrons. 3. Atoms share pairs of electrons in covalent bonds. 4. Life depends of hydrogen bonds in water. 5. Many compounds dissolve in water. 6. Some compounds form acids or bases. 7. Carbon atoms have unique bonding properties. 8. Four main types of carbon-based	• How would you differentiate between ionic and covalent bond? • Describe an example of cohesion or adhesion that you might observe during your daily life. • How are carbohydrates and lipids similar? How are they different? • How do endothermic and exothermic reactions differ? • What is a catalyst?	3.1.10.A2 Explain cell processes in terms of chemical reactions and energy changes. 3.1.12.A7 Evaluate metabolic activities using experimental knowledge of enzymes. Describe the potential impact of stem cell research on the biochemistry and physiology of life. 3.1.B.A2 Identify the initial reactants, final products, and general purposes of photosynthesis and cellular respiration. Explain the important role of ATP in cell metabolism. Describe the relationship between photosynthesis and cellular respiration in photosynthetic organisms.	• Identify elements common to living things. • Describe how ions form. • Compare ionic and covalent bonding. • Recognize the importance of hydrogen bonding. • Explain why many compounds dissolve in water. • Compare acids and bases. • Describe the bonding properties of carbon atoms. • Compare carbohydrates, lpids, proteins, and nucleic acids. • Describe how bonds break and reform during chemical reactions.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		molecules are found in living things. 9. Bonds break and form during chemical reactions. 10. Chemical reactions release or absorb energy 11. A catalyst lowers activation energy. 12. Enzymes allow chemical reactions to occur under tightly controlled conditions.		Explain why many biological macromolecules such as ATP and lipids contain high energy bonds. Explain the importance of enzymes as catalysts in cell reactions. Identify how factors such as pH and temperature may affect enzyme function. 3.1.B.A7 Analyze the importance of carbon to the structure of biological macromolecules. Compare and contrast the functions and structures of proteins, lipids, carbohydrates, and nucleic acids. Explain the consequences of extreme changes in pH and temperature on cell proteins. 3.1.B.A8 CHANGE AND CONSTANCY Recognize that systems within cells and multicellular organisms interact to maintain homeostasis. PATTERNS Demonstrate the repeating patterns that occur in biological polymers. SYSTEMS Describe how the unique properties of water support life. 3.1.C.A7 Illustrate the formation of carbohydrates, lipids, proteins, and nucleic acids. 3.2.10.A1 Predict properties of elements using trends of the periodic table.	• Explain why chemical reactions release or absorb energy. • Explain the effect of a catalyst on activation energy. • Describe how enzymes regulate chemical reactions.		

				Identify properties of matter that depend on sample size. Explain the unique properties of water (polarity, high boiling point, forms hydrogen bonds, high specific heat) that support life on Earth. 3.2.10.A2 Compare and contrast different bond types that result in the formation of molecules and compounds. Explain why compounds are composed of integer ratios of elements. 3.2.10.A4 Describe chemical reactions in terms of atomic rearrangement and/or electron transfer. Predict the amounts of products and reactants in a chemical reaction using mole relationships. Explain the difference between endothermic and exothermic reactions. Identify the factors that affect the rates of reactions. 3.2.C.A2 Compare the electron configurations for the first twenty elements of the periodic table. Relate the position of an element on the periodic table to its electron configuration and compare its reactivity to the reactivity of other elements in the table. Explain how atoms combine to form compounds through both ionic and covalent bonding.			

				Predict chemical formulas based on the number of valence electrons. Draw Lewis dot structures for simple molecules and ionic compounds. Predict the chemical formulas for simple ionic and molecular compounds. Use the mole concept to determine number of particles and molar mass for elements and compounds. Determine percent compositions, empirical formulas, and molecular formulas.			
Unit 2 - Cell Structure and Function (Weeks 7-8	• Cells are the basic unit of life. • Eukaryotic cells share many similarities. • The cell membrane is a barrier that separates a cell from the external environment. • Materials move across membranes because of concentration differences. • Cells use energy to transport materials that cannot diffuse across a membrane.	1. Early studies led to the development of the cell theory. 2. Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells. 3. Cells have an internal structure. 4. Several organelles are involved in making and processing proteins. 5. Other organelles have various functions. 6. Plant cells have cell walls and chloroplasts. 7. Cell membranes are composed of two phospholipid layers. 8. Chemical signals are	• In what ways are cells similar to atoms? • How would you outline the structure of a nucleus? • How are receptors and transport proteins similar? • How do endocytosis and exocytosis differ from diffusion?	3.1.10.A2 Explain cell processes in terms of chemical reactions and energy changes. 3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.B.A1 Describe the common characteristics of life. Compare and contrast the cellular structures and degrees of complexity of prokaryotic and eukaryotic organisms. Explain that some structures in eukaryotic cells developed from	• Describe developments that led to the cell theory. • Differentiate between eukaryotic and prokaryotic cells. • Describe the internal structure of eukaryotic cells. • Summarize the functions of organelles in plant and animal cells. • Describe the structure of the cell membrane. • Summarize how chemical signals are transmitted across the cell membrane. • Describe passive transport. • Distinguish between osmosis, diffusion, and facilitated transport.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		transmitted across the cell membrane. 9. Diffusion and osmosis are types of passive transport. 10. Some molecules diffuse through transport proteins. 11. Proteins can transport materials against a concentration gradient. 12. Endocytosis and exocytosis transport materials across the membrane in vesicles.		early prokaryotic cells (e.g., mitochondria, chloroplasts) 3.1.B.A5 Relate the structure of cell organelles to their function (energy capture and release, transport, waste removal, protein synthesis, movement, etc). Explain the role of water in cell metabolism. Explain how the cell membrane functions as a regulatory structure and protective barrier for the cell. Describe transport mechanisms across the plasma membrane.	• Describe active transport. • Distinguish among endocytosis, phagocytosis, and exocytosis.		
Unit 2 - Cells and Energy (Weeks 9-10)	• All cells need chemical energy. • The overall process of photosynthesis produces sugars that store chemical energy. • Photosynthesis requires a series of chemical reactions. • The overall process of cellular respiration converts sugar into ATP using oxygen. • Cellular respiration is an aerobic process with two main stages.	1. The chemical energy used for most cell processes is carried by ATP. 2. Organisms break down carbon-based molecules to produce ATP. 3. A few types of organisms do not need sunlight and photosynthesis as a source of energy. 4. Photosynthetic organisms are producers. 5. Photosynthesis in plants occurs in chloroplasts. 6. The first stage of photosynthesis captures and transfers energy.	• Describe what happens during the process of photosynthesis . • Describe what happens during the process of cellular respiration. • What is the role of ATP? • How does the Krebs cycle affect the transport of electrons during cellular respiration? • How would you recognize the light-dependent and light-independent reactions of photosynthesis ?	3.1.10.A2 Explain cell processes in terms of chemical reactions and energy changes. 3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive. 3.1.B.A2 Identify the initial reactants, final products, and general purposes of photosynthesis and cellular respiration. Explain the important role of ATP in cell metabolism. Describe the relationship between photosynthesis and cellular respiration in photosynthetic organisms. Explain why many biological macromolecules such as ATP and lipids contain high energy bonds.	• Recognize the importance of ATP as an energy-carrying molecule. • Identify energy sources used by organisms. • Describe the light-dependent reactions in which energy is captured. • Describe the light-independent reactions in which sugar is produced. • Describe the process of cellular respiration. • Compare cellular respiration to photosynthesis. • Describe the process of glycolysis. • Describe the details of the Krebs cycle and	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	• Fermentation allows the production of a small amount of ATP without oxygen.	7. The second stage of photosynthesis used energy from the first stage to make sugars. 8. Cellular respiration makes ATP by breaking down sugars. 9. Cellular respiration is like a mirror image of photosynthesis. 10. Glycolysis is needed for cellular respiration. 11. The Krebs cycle is the first main part of cellular respiration. 12. The electron transport chain is the second main part of cellular respiration. 13. Fermentation allows glycolysis to continue. 14. Fermentation and its products are important in several ways.	• How are sugars built during the Calvin cycle?	Explain the importance of enzymes as catalysts in cell reactions. Identify how factors such as pH and temperature may affect enzyme function. 3.1.B.A7 Analyze the importance of carbon to the structure of biological macromolecules. Compare and contrast the functions and structures of proteins, lipids, carbohydrates, and nucleic acids. Explain the consequences of extreme changes in pH and temperature on cell proteins.	the electron transport chain. • Describe the process of fermentation. • Summarize the importance of fermentation.		
Unit 2 - Cell Growth and Division (Weeks 11-12)	• Cells have distinct phases of growth, reproduction, and normal functions. • Cells divide during mitosis and cytokinesis. • Cell cycle regulation is	1. The cell cycle has four main stages. 2. Cells divide at different rates. 3. Cell size is limited. 4. Chromosomes condense at the start of mitosis. 5. Mitosis and cytokinesis produce two genetically	• Discuss the different stages of the cell cycle. • Compare and contrast prophase and telophase. • Explain how cancer cells differ from healthy cells.	3.1.10.A4 Describe the cell cycle and the process and significance of mitosis. 3.1.10.A6 Identify the advantages of multi-cellularity in organisms. 3.1.12.A4 Explain how the cell cycle is regulated. 3.1.12.A7	• Describe the stages of the cell cycle. • Compare rates of division in different cell types. • Identify factors that limit cell size. • Describe the structure of a chromosome. • Follow chromosomes	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable,	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	necessary for healthy growth. • Many organisms reproduce by cell division. • Cells work together to carry out complex function.	identical daughter cells. 6. Internal and external factors regulate cell division. 7. Cell division is uncontrolled in cancer. 8. Binary fission is similar in function to mitosis. 9. Some eukaryotes reproduce through mitosis. 10. Multicellular organisms depend on interactions among different cell types. 11. Specialized cells perform specific functions. 12. Stem cells can develop into different cell types.	• Explain how mitosis differs from binary fission. • Describe how tissues, organs, and organ systems are similar.	Evaluate metabolic activities using experimental knowledge of enzymes. Describe the potential impact of stem cell research on the biochemistry and physiology of life. 3.1.B.A4 Summarize the stages of the cell cycle. Examine how interactions among the different molecules in the cell cause the distinct stages of the cell cycle which can also be influenced by other signaling molecules. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction. Compare and contrast a virus and a cell. Relate the stages of viral cycles to the cell cycle. 3.1.B.A6 Explain how cells differentiate in multicellular organisms. 3.1.B.A8 CHANGE AND CONSTANCY Recognize that systems within cells and multicellular organisms interact to maintain homeostasis. PATTERNS Demonstrate the repeating patterns that occur in biological polymers. SYSTEMS Describe how the unique properties of water support life. 3.1.C.A4 Relate mitosis and meiosis at the molecular level.	through the processes of mitosis and cytokinesis. • Identify internal and external factors that regulate cell division. • Explain cancer in terms of the cell cycle. • Compare and contrast binary fission and mitosis. • Describe how some eukaryotes reproduce through mitosis. • Describe the specialization in multicellular organisms. • Identify different types of stem cells.	Extended time for assignments when needed. Separate testing environment when applicable.	

Unit 3 - Meiosis and Mendel (Weeks 13-14)	• Gametes have half the number of chromosomes that body cells have. • During meiosis, diploid cells undergo two cell divisions that result in haloid cells. • Mendel's research showed that traits are inherited as discrete units. • Genes encode proteins that produce a diverse range of traits. • The inheritance of trait follows the rule of probability. • Independent assortment and crossing over during meiosis result in genetic diversity.	1. You have body cells and gametes. 2. Your cells have autosomes and sex chromosomes. 3. Body cells are diploid; gametes are haploid. 4. Cells go through two rounds of division in meiosis. 5. Haploid cells develop into mature gametes. 6. Mendel laid the groundwork for genetics. 7. Mendel's data revealed patterns of inheritance. 8. The same gene can have many versions. 9. Genes influence the development of traits. 10. Punnett squares illustrate genetic crosses. 11. A monohybrid cross involves one trait. 12. A dihybrid cross involves two traits. 13. Heredity patterns can be calculated with probability. 14. Sexual reproduction creates unique gene combinations. 15. Crossing over during meiosis	• Explain the difference between haploid and diploid cells. • Outline the stages of meiosis. • Describe Mendel's contribution to genetics. • Compare and contrast genotype and phenotype. • Outline, using Punnett squares, monohybrid and dihybrid crosses. • Explain the role of crossing over and independent assortment.	3.1.10.B1 Describe how genetic information is inherited and expressed. 3.1.10.B2 Explain the process of meiosis resulting in the formation of gametes. Compare and contrast the function of mitosis and meiosis. 3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population. 3.1.12.B5 PATTERNS Relate the monomer structure of bio macromolecules to their functional roles. 3.1.B.B2 Describe how the process of meiosis results in the formation of haploid gametes and analyze the importance of meiosis in sexual reproduction. \Compare and contrast the function of mitosis and meiosis. \Illustrate that the sorting and recombining of genes in sexual reproduction results in a great variety of possible gene combinations in offspring. 3.1.B.B5 PATTERNS Describe how Mendel’s laws of segregation and independent assortment can be observed through patterns of inheritance. Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, codominant, sex-linked,	• Differentiate between body cells and gametes. • Compare and contrast autosomes and sex chromosomes. • Compare and contrast the two rounds of division in meiosis. • Describe how haploid cells develop into mature gametes. • Describe the patterns of inheritance that Mendel's data revealed. • Summarize Mendel's law of segregation. • Explain how there can be many versions of one gene. • Describe how genes influence the development of traits. • Describe monohybrid and dihybrid crosses. • Explain how heredity can be illustrated mathematically. • Describe how sexual reproduction creates unique gene combinations. • Explain how crossing over during meiosis increases genetic diversity	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		increases genetic diversity		polygenic, incomplete dominance, multiple alleles) CONSTANCY AND CHANGE Explain how the processes of replication, transcription, and translation are similar in all organisms. Explain how gene actions, patterns of heredity, and reproduction of cells and organisms account for the continuity of life. SCALE Demonstrate how inherited characteristics can be observed at the molecular, cellular, and organism levels. 3.1.C.A4 Relate mitosis and meiosis at the molecular level.			
Unit 3 - Extending Mendelian Genetics (Weeks 15-16)	• The chromosomes on which genes are located can affect the expression of traits. • Phenotype is affected by different factors. • Genes can be mapped to specific locations on chromosomes. • A combination of methods is used to study human genetics.	1. Two copies of each autosomal gene affect phenotype. 2. Males and females can differ in sex-linked traits. 3. Phenotype can depend on interactions of alleles. 4. Many genes may interact to produce one trait. 5. The environment interacts with genotype. 6. Gene linkage was explained through fruit flies. 7. Linkage maps estimate distances between genes. 8. Human genetics follows the	• Compare and contrast the expression of autosomal and sex-linked genes. • Explain the difference between incomplete dominance and codominance. • Discuss how fruit flies have aided in studying gene linkage. • Discuss the importance of using a pedigree. • Explain how a pedigree differs from a Punnett square.	3.1.10.C2 Explain the role of mutations and gene recombination in changing a population of organisms. 3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population. 3.1.12.B3 Analyze gene expression at the molecular level. Explain the impact of environmental factors on gene expression. 3.1.B.B5 PATTERNS Describe how Mendel's laws of segregation and independent assortment can be observed through patterns of inheritance. Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, codominant, sex-linked,	• Relate dominant-recessive patterns of inheritance in autosomal chromosomes to genetic disorders. • Describe patterns of inheritance in sex-linked traits. • Describe different types of allele interactions. • Describe polygenic traits and the effect of environmental factors on phenotype. • Describe the discovery of gene linkage. • Explain how linkage maps can be used to estimate distances between genes. • Examine patterns of inheritance in humans.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		patterns seen in other organisms. 9. Females can carry sex-linked genetic disorders. 10. A pedigree is a chart for tracing genes in a family. 11. Several methods help map human chromosomes.		polygenic, incomplete dominance, multiple alleles) CONSTANCY AND CHANGE Explain how the processes of replication, transcription, and translation are similar in all organisms. Explain how gene actions, patterns of heredity, and reproduction of cells and organisms account for the continuity of life. SCALE Demonstrate how inherited characteristics can be observed at the molecular, cellular, and organism levels. 3.1.B.C2 Describe the theory suggesting that life on Earth arose as a single, primitive prokaryote about 4 billion years ago and that for the next 2 billion years, a huge diversity of single-celled organisms evolved. Analyze how increasingly complex, multicellular organisms evolved once cells with nuclei developed. Describe how mutations in sex cells may be passed on to successive generations and that the resulting phenotype may help, harm, or have little or no effect on the offspring's success in its environment. Describe the relationship between environmental changes and changes in the gene pool of a population	• Describe how a pedigree is used. • Identify several methods for mapping human chromosomes.		
Unit 3 - From DNA to Proteins (Weeks 17-18)	• DNA was identified as the genetic material through a	1. Griffith found a "transforming principle". 2. Avery identifies DNA as the transforming principle.	• Explain how Hersey and Chase confirmed that DNA was carried the	3.1.10.A7 Describe the relationship between the structure of organic molecules and the function they serve in living organisms.	• Describe Griffith's discovery of a transforming principle. • Explain how Avery identified DNA as	Students will be given the following: Preferential seating when applicable.	Daily assignments. End of the Chapter Test.

	series of experiments. • DNA structure is the same in all organisms. • DNA replication copies the genetic information of a cell. • Transcription converts a gene into a single-stranded RNA molecule. • Translation converts an mRNA message into a polypeptide, or protein. • Gene expression is carefully regulated in both prokaryotic and eukaryotic cells. • Mutations are changes in DNA that may or may not affect phenotype.	3. Hersey and Chase confirm that DNA is the genetic material. 4. DNA is composed of four types of nucleotides. 5. Watson and Crick developed an accurate model of DNA's three-dimensional structure. 6. Nucleotides always pair in the same way. 7. Replication copies the genetic information. 8. Proteins carry out the process of replication. 9. Replication is fast and accurate. 10. RNA carries DNA's instructions. 11. Transcription makes three types of RNA. 12. The transcription process is similar to replication. 13. Amino acids are coded by mRNA base sequences. 14. Amino acids are linked to become a protein. 15. Prokaryotic cells turn genes on and off by controlling transcription.	genetic material. • Outline the structure of DNA. • Describe the bonding pattern of the nucleotides. • Compare and contrast transcription and translation. • Explain how replication and transcription are similar. • Describe the three types of RNA. • Outline the process of protein synthesis. • Explain what a mutation is.	Explain how cells store and use information to guide their functions. 3.1.10.B1 Describe how genetic information is inherited and expressed. 3.1.10.B3 Describe the basic structure of DNA and its function in genetic inheritance. Describe the role of DNA in protein synthesis as it relates to gene expression. 3.1.10.C2 Explain the role of mutations and gene recombination in changing a population of organisms. 3.1.12.A7 Evaluate metabolic activities using experimental knowledge of enzymes. Describe the potential impact of stem cell research on the biochemistry and physiology of life. 3.1.12.B1 Explain gene inheritance and expression at the molecular level. 3.1.12.B3 Analyze gene expression at the molecular level. Explain the impact of environmental factors on gene expression. 3.1.B.B1 Explain that the information passed from parents to offspring is transmitted by means of genes which are coded in DNA molecules.	the transforming principle. • Summarize the experiments of Hersey and Chase that confirmed DNA as the genetic material. • Describe the interaction of the four nucleotides that make up DNA. • Describe the three-dimensional structure of DNA. • Summarize the process of DNA replication. • Describe the role of enzymes in DNA replication. • Describe the relationship between RNA and DNA. • Identify the three kind of RNA and their functions. • Compare transcription to replication. • Describe how mRNA codons are translated into amino acids. • Summarize the process of protein synthesis. • Describe how prokaryotes turn genes on and off. • Explain how gene expression is regulated in eukaryotic cells. • Distinguish between different types of mutations. • Explain why mutations may or	Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable	Labs and Classroom Activities

		16. Eukaryotic cells regulate gene expression at many points. 17. Some mutations affect a single gene while others affect an entire chromosome. 18. Mutations may or may not affect phenotype. 19. Mutations can be caused by several factors		Explain the basic process of DNA replication. Describe the basic processes of transcription and translation. Explain how crossing over, jumping genes, and deletion and duplication of genes results in genetic variation. Explain how mutations can alter genetic information and the possible consequences on resultant cells. 3.1.B.B3 Describe the basic structure of DNA, including the role of hydrogen bonding. Explain how the process of DNA replication results in the transmission and conservation of the genetic code. Describe how transcription and translation result in gene expression. Differentiate among the end products of replication, transcription, and translation. Cite evidence to support that the genetic code is universal. 3.1.B.B5 PATTERNS Describe how Mendel's laws of segregation and independent assortment can be observed through patterns of inheritance. Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, codominant, sex-linked, polygenic, incomplete dominance, multiple alleles)	may not affect phenotype. • List some factors that cause mutations.		

				CONSTANCY AND CHANGE Explain how the processes of replication, transcription, and translation are similar in all organisms. Explain how gene actions, patterns of heredity, and reproduction of cells and organisms account for the continuity of life. SCALE Demonstrate how inherited characteristics can be observed at the molecular, cellular, and organism levels. 3.2.C.B3 Describe the law of conservation of energy. Explain the difference between an endothermic process and an exothermic process.			
Unit 3 - Frontiers of Biotechnology (Weeks 19-20)	• Biotechnology relies on cutting DNA at specific places. • The polymerase chain reaction rapidly copies segments of DNA. • DNA fingerprints identify people at the molecular level. • DNA sequences of organisms can be changed. • Entire genomes are sequenced, studied, and compared. • Genetics provides a basis for new	1. Scientist use several techniques to manipulate DNA. 2. Restriction enzymes cut DNA. 3. Restriction maps show the lengths of DNA fragments. 4. PCR uses polymerases to copy DNA segments. 5. PCR is a three-step process. 6. A DNA fingerprint is a type of restriction map. 7. DNA fingerprinting is used for identification. 8. Entire organisms can be cloned.	• Explain the role of a restriction enzyme. • Outline the steps of PCR. • Explain how a DNA fingerprint be used. • Discuss the issue of cloning. • Discuss the issue of genetic engineering. • Explain how genetic screening can be useful. • Discuss the importance of the Human Genome Project.	3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture. 3.1.12.A7 Evaluate metabolic activities using experimental knowledge of enzymes. Describe the potential impact of stem cell research on the biochemistry and physiology of life. 3.1.12.B4 Evaluate the societal impact of genetic engineering techniques and applications. 3.1.B.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture 3.4.10.B1	• Summarize how restriction enzymes cut DNA. • Explain how restriction maps chow the length of DNA fragments. • Describe the role of polymerases in copying DNA segments. • Outline the three-stpe PCR process. • Describe what a DNA fingerprint represents. • Summarize how DNA fingerprints are used for identification. • Describe how organisms are cloned. • Explain how new genes can be added to an organism's DNA.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	medical treatments.	9. New genes can be added to an organism's DNA. 10. Genetic engineering produces organisms with new traits. 11. Genomics involves the study of gened, gen functions, and entire genomes. 12. Technology allows the study and comparison of both genes and proteins. 13. Genetic screening can detect genetic disorders. 14. Gene therapy is the replacement of faulty genes.		Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.	• Describe genomics. • Identify how technology helps compare ans stuyd genes and proteins. • Explain how genetic screening can detect disorders. • Describe how gene therapy research seeks to replace faulty genes.		
Unit 4 - Principles of Evolution (Weeks 21-22	• There were theories of biological and geologic change before Darwin. • Darwin's voyage provided insight into evolution. • Darwin proposed natural selection as a mechanism for evolution. • Evidence of common ancestry among species comes from many sources.	1. Early scientist proposed ideas about evolution. 2. Theories of geologic change set the stage for Darwin's theory. 3. Darwin observed differences among island species. 4. Darwin observed fossil and geologic evidence supporting an ancient Earth. 5. Several key insights led to Darwin's ides for natural selection. 6. Natural selection	• Explain who Carolus Linnaeus was. • Discuss Darwin observed on his island voyage. • Discuss natural selection as a tool to evolution in a species. • Explain how structural patterns are clues to a species history. • In what ways did evolution unite all fields of biology?	3.1.10.C1 Explain the mechanisms of biological evolution. 3.1.10.C3 CONSTANCY AND CHANGE Interpret data from fossil records, anatomy and physiology, and DNA studies relevant to the theory of evolution. 3.1.12.C1 Analyze how natural selection leads to speciation. 3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium). Evaluate survival of the fittest in terms of species that have	• Examine early ideas about evolution. • Identify three geological theories that influenced scientific debate over evolution. • Describe how Darwin arrived at his idea about species variations. • Recognize how Darwin's discoveries supported Lyell's ancient-Earth theory. • Compare artificial selection to natural selection. • Examine the factors Darwin considered in	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	• New technology is furthering our understanding of evolution.	explains how evolution can occur. 7. Natural selection acts on existing variation. 8. Evidence for evolution in Darwin's time came from several sources. 9. Structural patterns are clues to the history of a species. 10. Fossils provide a record of evolution. 11. Molecular and genetic evidence support fossil and anatomical evidence. 12. Evolution unites all fields of biology.		remained unchanged over long periods of time. 3.1.B.C1 Describe species as reproductively distinct groups of organisms. Analyze the role that geographic isolation can play in speciation. Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population. Describe how the degree of kinship between species can be inferred from the similarity in their DNA sequences. 3.1.B.C2 Describe the theory suggesting that life on Earth arose as a single, primitive prokaryote about 4 billion years ago and that for the next 2 billion years, a huge diversity of single-celled organisms evolved. Analyze how increasingly complex, multicellular organisms evolved once cells with nuclei developed. Describe how mutations in sex cells may be passed on to successive generations and that the resulting phenotype may help, harm, or have little or no effect on the offspring's success in its environment. Describe the relationship between environmental changes and changes in the gene pool of a population 3.1.B.C3 CONSTANCY AND CHANGE	forming his theory of natural selection. • Summarize the four principles of natural selection. • Recognize the major sources of evidence for evolution. • Examine the pattern of features that real the history of a species. • Summarize different types of evidence that support evolution. • Recognize the importance of evolution in unifying all branches of biological study.		

				Compare and contrast various theories of evolution. Interpret data from fossil records, anatomy and physiology, and DNA studies relevant to the theory of evolution. PATTERNS Discuss the implications of a universal genetic code for evolution.			
Unit 4 - The Evolution of Populations (Weeks 23-24)	• A population shares a common gene pool. • Populations, not individuals, evolve. • Natural selection is not the only mechanism through which populations evolve. • Hardy-Weinberg equilibrium provides a framework for understanding how populations evolve. • New species can arise when populations are isolated. • Evolution occurs in patterns.	1. Genetic variation in a population increases the chance that some individuals will survive. 2. Genetic variation comes from several sources. 3. Natural selection acts on distributions of traits. 4. Natural selection can change the distribution of a trait on one of three ways. 5. Gene flow is the movement of alleles between populations. 6. Genetic drift is a change in allele frequencies due to chance. 7. Sexual selection occurs when certain traits increase mating success. 8. Hardy-Weinberg equilibrium describes populations that are not evolving.	• Outline several ways that genetic variation comes from. • Discuss the ways in which natural selection changes a population. • Compare and contrast natural selection and sexual selection. • Outline the Hardy-Weinberg equilibrium. • Explain how speciation can occur. • Discuss what extinction is and patterns that have occurred throughout time.	3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.C2 Analyze how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment. 3.1.B.C1 Describe species as reproductively distinct groups of organisms. Analyze the role that geographic isolation can play in speciation. Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population. Describe how the degree of kinship between species can be inferred from the similarity in their DNA sequences. 3.1.B.C2 Describe the theory suggesting that life on Earth arose as a single, primitive prokaryote about 4 billion years ago and that for the next 2 billion years, a huge	• Describe the significance of genetic variation within a population. • Identify sources of genetic variation. • Describe how natural selection acts on the distribution of traits in a population. • Explain three ways natural selection can change the distribution of a trait in a population. • Explain how gene flow, genetic drift, and sexual selection can lead to the evolution of populations. • Identify the conditions that define Hardy-Weinberg equilibrium. • Explain the predictive value of the Hardy-Weinberg equation. • Explain how isolation of populations can lead to speciation.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		9. The Hardy-Weinberg equation is used to predict genotype frequencies in a population. 10. There are five factors that can lead to evolution. 11. The isolation of populations can lead to speciation. 12. Populations can become isolated in several ways. 13. Evolution through natural selection in not random. 14. Species can shape each other over time. 15. Species can become extinct. 16. Speciation often occurs in pattern.		diversity of single-celled organisms evolved. Analyze how increasingly complex, multicellular organisms evolved once cells with nuclei developed. Describe how mutations in sex cells may be passed on to successive generations and that the resulting phenotype may help, harm, or have little or no effect on the offspring's success in its environment. Describe the relationship between environmental changes and changes in the gene pool of a population	• Describe how populations can become isolated. • Describe different types and rates of evolution. • Compare different types and rated of extinction.		
Unit 9 - Human Systems and Homeostasis (Week 25)	• The human body has five levels of organization. • Homeostasis is the regulation and maintenance of the internal environment. • Systems interact to maintain homeostasis.	1. Specialized cells develop from a single zygote. 2. Specialized cells function together in tissues, organs, organ systems, and the whole organism. 3. Conditions within the body must remain within a narrow range. 4. Negative feedback loops are necessary for homeostasis. 5. Each organ system affects	• Outline the levels of organization within an organism. • Explain homeostasis and why it is important to the body. • Describe how organ systems affect each other, use an example.	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.10.A8 Investigate the spatial relationships of organisms' anatomical features using specimens, models, or computer programs. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A5 Analyze how structure is related to function at all levels of	• Describe cell specialization and levels of organization. • Identify how levels of organization work together in an organism. • Relate homeostasis to the internal environment of the body. • Explain how negative and positive feedback maintain homeostasis. • Describe the interaction between organ	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		other organ systems. 6. A disruption of homeostasis can be harmful		biological organization from molecules to organisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.B.A3 Explain how all organisms begin their life cycles as a single cell and that in multicellular organisms, successive generations of embryonic cells form by cell division. 3.1.B.A6 Explain how cells differentiate in multicellular organisms.	systems in terms of homeostasis. • Describe the effect of disruption of homeostasis.		
Unit 9 - Nervous and Endocrine Systems (Weeks 26-28)	• The nervous system and the endocrine system provide the means by which organ systems communicate. • The nervous system is composed of highly specialized cells. • The senses detect the internal and external environments. • The central nervous system interprets information, and the peripheral nervous system gathers and transmits information. • Scientist study the functions	1. The body's communication systems help maintain homeostasis. 2. The nervous and endocrine systems have different methods and rates of communication. 3. Neurons are highly specialized cells. 4. Neurons receive and transmit signals. 5. The senses help to maintain homeostasis. 6. The senses detect physical and chemical stimuli. 7. The nervous systems two parts work together. 8. The CNS processes information.	• Compare and contrast the central nervous system (CNS) and the peripheral nervous system (PNS). • Draw and label a neuron and explain the function of each part. • List and explain the job of the sense organs. • Explain how drugs alter the brains chemistry. • Describe the job of the endocrine system. • Explain the job of hormones.	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8 CHANGE AND CONSTANCY Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the	• Explain how the nervous and endocrine systems help maintain homeostasis. • Contrast the nervous and endocrine systems' methods of communication. • Describe neurons as specialized cells. • Explain how neurons transmit and receive signals. • Explain how senses help maintain homeostasis. • Explain hoe the senses detect physical and chemical stimuli. • Explain how the two parts of the nervous system work together. • Describe the structure and function of the	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	and chemistry of the brain. • The endocrine system produces hormones that affect growth, development, and homeostasis.	9. The PNS links the CNS to muscles and other organs. 10. New techniques improve our understanding of the brain. 11. Changes in brain chemistry can cause illness. 12. Drugs alter brain chemistry. 13. Hormones influence a cell's activities by entering the cell or binding to its membrane. 14. Endocrine glands secrete hormones that act throughout the body. 15. The hypothalamus interacts with the nervous and endocrine systems. 16. Hormonal imbalances can cause serious illness.		development, selection, and use of technologies.	central nervous system (CNS). • Describe the structure and function of the peripheral nervous system (PNS). • Describe modern technologies used to study the human brain. • Describe how an imbalance of neurotransmitters can cause illness. • Explain how drugs change brain chemistry. • Describe how hormones influence the activities of a cell. • Describe the major endocrine glands and the hormones they produce. • Explain the role of the hypothalamus. • Identify some endocrine diseases, their causes, and effects.		
Unit 9 - Respiratory and Circulatory Systems (Weeks 29-31)	• The respiratory and circulatory systems bring oxygen and nutrients to the cells. • The respiratory system exchanges oxygen and carbon dioxide. • The heart is a muscular pump that moves the blood through two pathways.	1. The respiratory and circulatory systems work together to maintain homeostasis. 2. The respiratory system moves gases into and out of the blood. 3. The circulatory system moves blood to all parts of the body. 4. Gas exchange occurs in the	• Outline the path of air in the respiratory system. • Explain the structure and function of alveoli. • Outline the path of lood through the circulatory system. • Compare and contrast	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8	• Describe the respiratory system and its functions. • Describe the circulatory system and its functions. • Summarize gas exchange in the lungs. • Describe how respiratory diseases interfere with gas exchange. • Describe the structure and	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	• The circulatory system transports materials throughout the body. • Blood is a complex tissue that transports materials. • The lymphatic system provides another type of circulation in the body.	alveoli of the lungs. 5. Respiratory diseases interfere with gas exchange. 6. The tissues and structure of the heart make it an efficient pump. 7. The heart pumps blood through two main pathways. 8. Arteries, veins, and capillaries transport blood to all parts of the body. 9. Lifestyle plays a key role in circulatory diseases. 10. Blood is composed mainly of cells, cell fragments, and plasma. 11. Platelets and different types of blood cells have different functions. 12. Lymph is collected from tissues and returned to the circulatory system. 13. The lymphatic system is a major part of the immune system.	arteries, veins, and capillaries. • Compare and contrast white blood cells, red blood cells, and platelets. • Explain the difference between pulmonary and systemic circulation. • Explain why the lymphatic system is an important part of the immune system.	CHANGE AND CONSTANCY Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.	function of the heart. • Contrast pulmonary and systemic circulation. • Describe the structures and functions of different blood vessels. • Differentiate between systolic and diastolic blood pressure. • Describe the effect of lifestyle on the circulatory system. • List the main components of blood. • Describe the functions of platelets and different types of blood cells. • Describe the lymphatic system and its relationship to the circulatory system. • Summarize the lymphatic system's function in the immune system.	Separate testing environment when applicable.	
Unit 9 - Immune System and Disease (Weeks 32-33)	• Germs cause many diseases in humans. • The immune system consists of organs, cells, and molecules	1. Germ theory states that microscopic particles cause certain diseases. 2. There are different types of pathogens.	• Explain how germ theory has changed over time. • Outline ways in which pathogens enter the body.	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various	• Summarize the germ theory. • Describe the different pathogens and the way they enter the body.	Students will be given the following: Preferential seating when applicable. Study guides.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	that fight infections. • The immune system has many responses to pathogens and foreign cells. • Living in a clean environment and building immunity help keep a person healthy. • An overactive immune system can make the body very unhealthy. • When the immune system is weakened the body cannot fight off diseases.	3. Pathogens can enter the body in different ways. 4. Many body systems protect you from pathogens. 5. Cells and proteins fight the body's infections. 6. Immunity prevents a person from getting sick from a pathogen. 7. Many body systems work to produce nonspecific responses. 8. Cells of the immune system produce specific responses. 9. The immune system rejects foreign tissues. 10. Many methods are used to control pathogens. 11. Vaccines artificially produce acquired immunity. 12. Allergies occur when the immune system responds to harmless antigens. 13. In autoimmune diseases, white blood cells attack the body's healthy cells. 14. Leukemia is characterized by	• Describe the body systems that help protect your body from pathogens. • Compare and contrast passive immunity and active immunity. • Compare and contrast cellular immunity and humoral immunity. • Explain how a vaccine works. • Explain allergies. • Discuss some diseases that weaken the immune system.	organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8 CHANGE AND CONSTANCY Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.	• Identify the body systems that protect you from pathogens. • Describe the cells and proteins that fight the body's infections. • Compare the two types of immunity. • Identify nonspecific immune responses and the body systems that produce them. • Summarize how the cells of the immune system respond to pathogens. • Explain how the immune system rejects foreign tissues. • Identify methods used to control pathogens. • Explain how vaccines artificially produce acquired immunity. • Explaiin what happens when the immune system responds to harmless antigens. • Describe autoimmune diseases. • Identify common autoimmune diseases. • Explain what leukemia is and how it weakens the immune system. • Summarize how HIV affects the immune system.	Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	

		abnormal white blood cells. 15. HIV targets the immune system.					
Unit 9 - Digestive and Excretory Systems (Week 34)	• Cells require many different nutrients. • The digestive system breaks down food into simpler molecules. • Nutrients are absorbed and solid wastes eliminated after digestion. • The excretory system removes wastes and helps maintain homeostasis.	1. Six types of nutrients help to maintain homeostasis. 2. Meeting nutritional needs supports good health. 3. Several digestive organs work together to break down food. 4. Digestion begins in the mouth and continues in the stomach. 5. Digestion is completed in part of the small intestine. 6. Most absorption of nutrients occurs in the small intestine. 7. Water is absorbed and solid wastes are eliminated from the large intestine. 8. The excretory system eliminates nonsolid wastes from the body. 9. The kidneys help to maintain homeostasis by filtering the blood. 10. Nephrons clean the blood and produce urine. 11. Injury and disease can damage kidney function.	• Outline the six nutrients needed for the body to maintain homeostasis. • Outline tha path of food through the digestive system. • Explain the role of vili in the small intestines. • Compare and contrast mechanical and chemical digestion. • Explain the function of the kidneys. • Discuss the importance of nephrons in the kidneys.	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8 CHANGE AND CONSTANCY Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.	• Identify six types of nutrients that help maintain homeostasis. • Describe ways of meeting nutritional needs that support good health. • Describe the organs of the digestive system. • Summarize the difference between mechanical and chemical digestion. • Describe how nutrients are sbsorbed in the small intestine. • Describe water absorption and solid-waste elimination in the large intestine. • Identify the main organs of the excretory system and their functions. • Explain how the kidneys help maintain homeostasis. • Describe treatments for kidney diseases and injuries.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

Unit 9 - Protection, Support, and Movement (Week 35)	• The skeletal system includes bones and tissues that are important for supporting, protecting, and moving your body. • Muscles are tissues that can contract, enabling movement. • The integumentary system has many tissues that protect the body.	1. Your skeletal system is made up of the appendicular and axial skeleton. 2. Bones connect to form joints. 3. Bones are living tissue. 4. Humans have three types of muscles. 5. Muscles contract when the nervous system causes muscle filaments to move. 6. The integumentary system helps maintain homeostasis. 7. The integumentary system consists of many different tissues.	• Compare the appendicular and axial skeletal systems. • Outline and describe the types of joints formed by bones. • Outline and describe the types of muscles in the body. • Explain how skeletal muscles move bone. • Outline and describe the parts of the skin.	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8 CHANGE AND CONSTANCY Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.	• Compare the axial and appendicular skeletons. • Describe the different types of joints. • Describe bone structure and growth. • Describe the three types of muscle in humans. • Explain how muscles contract. • Explain how the integumentary system helps maintain homeostasis. • Describe the structures of the integumentary system.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities
Unit 9 - Reproduction and Development (Week 36)	• Female and male reproductive organs fully develop during puberty. • Human reproductive processes depend on cycles of hormones. • Development progresses in stages from zygote to fetus. • Physical development	1. The female reproductive system produces ova. 2. The male reproductive system produces sperm. 3. Eggs mature and are released according to hormonal cycles. 4. Sperm production in the testes is	• Compare and contrast the male and female reproductive systems. • Explain the role hormones play in the reproductive system. • Explain the difference between a zygote and a fetus. • Outline the development of	3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions. 3.1.12.A1 Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. 3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions. 3.1.12.A8 CHANGE AND CONSTANCY	• Describe the structure and function of the female reproductive system. • Identify the structure and function of the male reproductive system. • Explain the role of hormones in the reproductive system. • Describe fertilization.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

	continues through adolescence and declines with age.	controlled by hormones. 5. Fertilization occurs when sperm cell joins egg cell. 6. Sexually transmitted diseases affect fertility and overall health. 7. The fertilized egg implants into the uterus and is nourished by the placenta. 8. A zygote develops into fully formed fetus in about 38 weeks. 9. The mother affects the fetus, and pregnancy affects the mother. 10. Birth occurs in three stages. 11. Human growth and aging also occur in stages.	a zygote to a fetus. • Discuss what happens as you age.	Describe and interpret dynamic changes in stable systems. 3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.	• Summarize how sexually transmitted diseases affect an individual. • Describe development following implantation. • Explain how an embryo gets nourishment. • Explain how the mother and fetus affect each other's health. • Describe the three stages of birth. • Describe the stages of human growth and aging.	environment when applicable.	