

ADVANCED BIOLOGY CURRICULUM

Course 18103

Advanced Biology students will learn the classification system of living organisms along with the characteristics that are used to group them. The different kingdoms and major phyla of living organisms will be studied. Students will also study the major systems of the human body learning their parts and functions. Major topics to be covered are: Cell structure and function, Linnaean classification of organisms, viruses, bacteria, protists, fungi, invertebrate diversity, vertebrate diversity, egg-laying organisms, and the human body systems with their structures and functions. The prerequisites for this course are passing the Biology course and demonstrated proficiency on the Keystone Exam or completion of the Keystone Biology course.

ADVANCED BIOLOGY OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
<ul style="list-style-type: none"> • Know cell structures and their functions. • Learn the basic characteristics, functions, and effects of viruses and bacteria. • Know common protists, their characteristics, life processes, and interactions in the environment. • Learn the basic characteristics, types, and processes of invertebrates. • Learn the basic features, characteristics and life processes of arthropods. • Understand the diversity of vertebrate life. • Explain the similarities and differences of the organisms that are amniotes. • Describe the functions and processes of the major human systems (circulatory, respirator, digestive, muscular, skeletal, nervous, and reproductive). 	<ul style="list-style-type: none"> • 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. • Be able to classify organisms based on characteristics and genetic relationships. • Describe how animals comprise a diverse kingdom. • Summarize the similarities and differences between different taxonomic groups of living organisms. • Summarize each of the major human systems and describe ways in which they interact with each other. 	Chapter Tests	1-year	Holt McDougal Biology

ADVANCED BIOLOGY MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
<p>Chapter 3 - Cell Structure and Function (Weeks 1-3)</p>	<ul style="list-style-type: none"> • 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. 	<ol style="list-style-type: none"> 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. Cell membranes are composed of two phospholipid layers. 7. Chemical signals are transmitted across the cell membrane. 8. Diffusion and osmosis are types of passive transport. 9. Some molecules diffuse through transport proteins. 	<ul style="list-style-type: none"> • 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? 	<p>3.1.10.A2 Explain cell processes in terms of chemical reactions and energy changes.</p> <p>3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.A6 Analyze how cells in different tissues/organs are specialized to perform specific functions.</p> <p>3.1.B.A5 Relate the structure of cell organelles to their function (energy capture and release, transport, waste removal, protein synthesis, movement, etc).</p> <p>Explain the role of water in cell metabolism.</p> <p>Explain how the cell membrane functions as a regulatory structure and protective barrier for the cell.</p> <p>Describe transport mechanisms across the plasma membrane.</p>	<ul style="list-style-type: none"> • Describe developments that led to the cell theory. • Differentiate between eukaryotic and prokaryotic cells. • Describe the internal structures of eukaryotic cells. • Summarize the function of organelles in an animal cell. • 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. • Describe active transport. • Distinguish among endocytosis, phagocytosis, and exocytosis. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> • Preferential seating when applicable. • Study guides. • Guided notes when applicable. • Extended time for assignments when needed. • Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>10. Proteins can transport materials against a concentration gradient.</p> <p>11. Endocytosis and exocytosis transport materials across the membrane in vesicles.</p>					
<p>Chapter 17 - The Tree Of Life (Weeks 4-6)</p>	<ul style="list-style-type: none"> Organisms can be classified based on physical similarities. Modern classification is based on evolutionary relationships. Molecular clocks provide clues to evolutionary history. The current tree of life has three domains. 	<ol style="list-style-type: none"> Linnaeus developed the scientific naming system still used today. Linnaeus' classification system has seven levels. The Linnaean classification system has limitations. Cladistics is classification based on common ancestry. Molecular evidence reveals species' relatedness. Molecular clocks use mutations to estimate evolutionary time. Mitochondrial DNA and ribosomal RNA provide two types of molecular clocks. 	<ul style="list-style-type: none"> How is the Linnaean system of classification similar to the system that we use today? How has evolutionary evidence changed the modern classification system? In what ways have mitochondrial DNA and ribosomal RNA affected the way that we classify organism today? How do the three Domains (Bacteria, Archaea, and Eukarya) differ? 	<p>3.1.10.A5 Relate life processes to sub-cellular and cellular structures to their functions.</p> <p>3.1.10.A8 Investigate the spatial relationships of organisms' anatomical features using specimens, models, or computer programs.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B1 Explain gene inheritance and expression at the molecular level.</p>	<ul style="list-style-type: none"> Examine the scientific naming system developed by Linnaeus. Identify the limitations of the Linnaean system. Describe classification by cladistics. Summarize how molecular evidence reveals species' relatedness. Explain how molecular clocks work. Describe two types of molecular clocks: mitochondrial DNA and ribosomal RNA. Describe classification as a work in progress. Identify the three domains in the tree of life as Bacteria, Archaea, and Eukarya. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		8. Classification is always a work in progress. 9. The three domains in the tree of life are Bacteria, Archaea, and Eukarya					
Chapter 18 - Viruses and Prokaryotes (Weeks 7-9)	<ul style="list-style-type: none"> Infections can be caused in several ways. Viruses exist in a variety of shapes and sizes. Some viral diseases can be prevented with vaccines. Bacteria and archaea are both single-celled prokaryotes. Prokaryotes perform important functions for organisms and ecosystems. Understanding bacteria is necessary to prevent and treat disease. 	<ol style="list-style-type: none"> Viruses, bacteria, viroids, and prions can all cause infection. Viruses differ in shape and in ways of entering host cells. Viruses cause two types of infections. Viruses cause many infectious diseases. Vaccines are made from weakened pathogens. Prokaryotes are widespread on Earth. Bacteria and archaea are structurally similar but have different molecular characteristics. Bacteria have various strategies for survival. Prokaryotes provide nutrients to 	<ul style="list-style-type: none"> Why are viruses, viroids, and prions not classified in the Linnaean classification system? What structures make up a virus? What are vaccines made of and why are they used today? How do bacteria differ from viruses? What is the job of an antibiotic? 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p>	<ul style="list-style-type: none"> Compare and contrast different types of infectious agents. Identify the structures and shapes of viruses. Describe different types of viral infections. Identify the names and symptoms of several viral diseases. Describe how vaccines are made. Describe different types of prokaryotes. Summarize the similarities and differences between bacteria and archaea. Describe the survival strategies of bacteria. Describe ways prokaryotes provide nutrients to humans and other animals. Recognize the roles prokaryotes play in ecosystems. Explain how bacteria cause disease. Describe how antibiotics work and the potential for 	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

		<p>humans and other animals.</p> <p>10. Prokaryotes play important roles in ecosystems.</p> <p>11. Some bacteria cause disease.</p> <p>12. Antibiotics are used to fight bacterial disease.</p> <p>13. Bacteria can evolve resistance to antibiotics.</p>			antibiotic resistance.		
Chapter 19 - Protists and Fungi (Weeks 10+12)	<ul style="list-style-type: none"> Kingdom Protista is the most diverse of all the kingdoms. Animal-like protists are single-celled heterotrophs that can move. Algae are plant-like protists. Fungus-like protists decompose organic matter. Fungi are heterotrophs that absorb their food. Fungi recycle nutrients in the environment. 	<ol style="list-style-type: none"> Protists can be animal-like, plantlike, or fungus like. Protists are difficult to classify. Animal-like protists move in various ways. Some animal-like protists cause disease. Plantlike protists can be single-celled or multicellular. Many plantlike protists can reproduce both sexually and asexually. Slime molds and water molds are fungus like protists. Fungi are adapted to absorb their 	<ul style="list-style-type: none"> Why are protists difficult to classify by the Linnaean system? What are the ways that the animal-like protists move about? Why were the fungi once classified as non-green plants? What some of the economic benefits of fungi? How are club fungi, cup fungi, and sac fungi different? 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p>	<ul style="list-style-type: none"> Describe how animals comprise a diverse kingdom. Identify the defining characteristics of animals. Describe the unique body parts of the animal phyla. Describe the criteria used to group animals. Explain how genetics reveals the evolutionary history of animals. Describe the characteristics and anatomy of sponges and cnidarians. Identify the characteristics of flatworms and annelids. Identify the characteristics of the phylum Mollusca and its seven classes. Identify characteristics of roundworms. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>food from the environment.</p> <p>9. Fungi come in many shapes and sizes.</p> <p>10. Fungi reproduce sexually and asexually.</p> <p>11. Fungi may be decomposers, pathogens, or mutualists.</p> <p>12. Fungi are studied for many purposes.</p>			<ul style="list-style-type: none"> Recognize the role of roundworms as parasites. Describe the symmetry of echinoderms. Identify the five classes of echinoderms and describe some of their characteristics 		
<p>Chapter 23 - Invertebrate Diversity (Weeks 13-14)</p>	<ul style="list-style-type: none"> Animals are diverse but share common characteristics. More than 95% of all animal species are invertebrates. Sponges and cnidarians are the simplest animals. Flatworms, mollusks, and annelids belong to closely related phyla. Roundworms have bilateral symmetry and shed their outer skeleton to grow. Echinoderms are on the same evolutionary branch as vertebrates. 	<ol style="list-style-type: none"> Animals are the most physically diverse kingdom of organisms. All animals share a set of characteristics. Each animal phylum has a unique body plan. Animals are grouped using a variety of criteria. A comparison of structure and genetics reveals the evolutionary history of animals. Cnidarians have specialized cells but no tissues. Cnidarians are the oldest existing animals that have 	<ul style="list-style-type: none"> What are the characteristics of the animal kingdom? How is bilateral symmetry different from radial symmetry? How does the polyp and medusa stages of the cnidarian differ? What characteristics describe the flatworms, annelids, and roundworms? How do the feeding techniques of the echinoderms differ? 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.10.C1 Explain the mechanisms of biological evolution.</p> <p>3.1.10.C3 CONSTANCY AND CHANGE Interpret data from fossil records, anatomy and physiology, and DNA studies relevant to the theory of evolution.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of</p>	<ul style="list-style-type: none"> Describe how animals comprise a diverse kingdom. Identify the defining characteristics of animals. Describe the unique body parts of the animal phyla. Describe the criteria used to group animals. Explain how genetics reveals the evolutionary history of animals. Describe the characteristics and anatomy of sponges and cnidarians. Identify the characteristics of flatworms and annelids. Identify the characteristics of the phylum Mollusca and its seven classes. Identify characteristics of roundworms. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>specialized tissues.</p> <ol style="list-style-type: none"> 8. Flatworms are simple bilateral animals. 9. Mollusks are diverse animals. 10. Annelids have segmented bodies. 11. Roundworms shed their outer skeleton as they grow. 12. Many roundworms are parasites. 13. Echinoderms have radial symmetry. 14. There are five classes of Echinoderms. 		<p>biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p> <p>3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium).</p> <p>Evaluate survival of the fittest in terms of species that have remained unchanged over long periods of time.</p>	<ul style="list-style-type: none"> • Recognize the role of roundworms as parasites. • Describe the symmetry of echinoderms. • Identify the five classes of echinoderms and describe some of their characteristics. 		
<p>Chapter 24 - A Closer Look At Arthropods (Weeks 15-16)</p>	<ul style="list-style-type: none"> • Arthropods are the most diverse of all animals. • Crustaceans are a diverse group of ancient arthropods. • Arachnids include spiders and their relatives. • Insects show an amazing range of adaptations. • Arthropods and humans interact in many ways. 	<ol style="list-style-type: none"> 1. Arthropod features are highly adapted. 2. Arthropod exoskeletons serve a variety of functions. 3. Arthropod diversity evolved over millions of years. 4. Crustaceans evolved as marine arthropods. 5. Crustacean appendages can take many forms. 6. There are many different types of crustaceans. 	<ul style="list-style-type: none"> • How are the features of an arthropod adapted for their way of life? • How are crustaceans related to the other arthropods? • Why are insects the dominant terrestrial arthropods? • How does complete metamorphosis differ from incomplete metamorphosis? • How do arthropods affect human 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.10.C1 Explain the mechanisms of biological evolution.</p> <p>3.1.10.C3 CONSTANCY AND CHANGE Interpret data from fossil records, anatomy and physiology, and DNA studies relevant to the theory of evolution.</p> <p>3.1.12.A2</p>	<ul style="list-style-type: none"> • Describe the adaptive features of arthropods, including the exoskeleton. • Recognize that arthropod diversity evolved over millions of years. • Explain the ecological significance of marine crustaceans. • Describe crustacean appendages and the main crustacean groups. • Describe the adaptations and diversity of arachnids. • Contrast incomplete metamorphosis and 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>7. Arachnids are the largest group of chelicerates.</p> <p>8. Arachnids have evolved into a diverse group.</p> <p>9. Insects are the dominant terrestrial arthropods.</p> <p>10. Insects undergo metamorphosis.</p> <p>11. Insects have adapted to life on land.</p> <p>12. Arthropods and humans share many of the same resources.</p> <p>13. Some arthropods can spread human disease.</p>	<p>life, such as competition for resources?</p>	<p>Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p> <p>3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium).</p> <p>Evaluate survival of the fittest in terms of species that have remained unchanged over long periods of time.</p>	<p>complete metamorphosis.</p> <ul style="list-style-type: none"> Describe how insects are adapted to life on land. Summarize the shared resources and interactions of arthropods and humans, including transmission of diseases. 		
<p>Chapter 25 - Vertebrate Diversity (Weeks 17+18)</p>	<ul style="list-style-type: none"> All vertebrates share common characteristics. The dominant aquatic vertebrates are fish. Bony fish include ray-finned and lobe-finned fish. Amphibians evolved from lobed-finned fish. Reptiles, birds, and mammals are adapted for life on land. 	<ol style="list-style-type: none"> The phylum Chordata contains all vertebrates and some invertebrates. All vertebrates share common features. Fossil evidence sheds light on the origins of vertebrates. Fish are vertebrates with gills and paired fins. Jaws evolved from gill supports. 	<ul style="list-style-type: none"> What is the difference between a vertebrate and invertebrate species? What are the characteristics of fish? How are the lobed finned fish related to vertebrate evolution? How are amphibians different from reptiles? What is an amniotic egg and how did it affect the 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.10.C1 Explain the mechanisms of biological evolution.</p> <p>3.1.10.C3 CONSTANCY AND CHANGE Interpret data from fossil records, anatomy and physiology, and</p>	<ul style="list-style-type: none"> Identify and give examples of the three groups of organisms in the phylum Chordata. Describe the characteristics and origins of vertebrates. Identify the characteristics of the two classes of jawed fish. Describe the evolution and advantage of jaws. Differentiate between the fins of ray-finned fish and lobe-finned fish. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<ol style="list-style-type: none"> 6. Only two groups of jawed fish still exist. 7. Ray-finned fish have a fan of bones in their fins. 8. Lobe-finned fish have paired rounded fins supported by a single bone. 9. Amphibians were the first animals with four limbs. 10. Amphibians return to the water to reproduce. 11. Modern amphibians can be divided into three groups. 12. Amniotes can retain moisture. 13. Amniotes do not need to return to water to reproduce. 	development of the reptiles?	<p>DNA studies relevant to the theory of evolution.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p> <p>3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium).</p> <p>Evaluate survival of the fittest in terms of species that have remained unchanged over long periods of time.</p>	<ul style="list-style-type: none"> • Describe the diversity of body plans of bony fish. • Explain the origin and function of fish's swim bladder. • Describe the adaptations of amphibians that help them live on land. • Summarize the reproduction and development of amphibians. • Distinguish among the three groups of modern amphibians. • Describe two important characteristics of amniotes that help them retain water. • Explain the evolutionary importance of the amniotic egg. 		
Chapter 26 - A Closer Look at Amniotes (Weeks 19-20)	<ul style="list-style-type: none"> • Reptiles, birds, and mammals are amniotes. • Reptiles were the first amniotes. • Birds have many adaptations for flight. • Evolutionary adaptations allowed mammals to succeed dinosaurs as a 	<ol style="list-style-type: none"> 1. Amniote embryos develop in a fluid-filled sac. 2. Anatomy and circulation differ among amniotes. 3. Amniotes can be ectothermic or endothermic. 4. Reptiles are a diverse group of amniotes. 5. Reptiles have been evolving 	<ul style="list-style-type: none"> • What happens when all the resources that are stored inside an amniote egg are used up? • How are ectotherms and endotherms different? • What are the adaptations of a reptile? 	<p>3.1.10.A1 Explain the characteristics of life common to all organisms.</p> <p>3.1.10.A3 Compare and contrast the life cycles of different organisms.</p> <p>3.1.10.B4 Explain how genetic technologies have impacted the fields of medicine, forensics, and agriculture.</p> <p>3.1.10.C1 Explain the mechanisms of biological evolution.</p>	<ul style="list-style-type: none"> • Describe the amniotic egg and its evolutionary significance. • Summarize key anatomical and circulatory differences among amniotes. • Explain two strategies for regulating body temperature. • Describe the diversity and evolution of reptiles. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> • Preferential seating when applicable. • Study guides. • Guided notes when applicable. • Extended time for assignments when needed. • Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	dominant terrestrial vertebrate.	<p>for millions of years.</p> <p>6. There are four modern groups of reptiles.</p> <p>7. Birds evolved from theropod dinosaurs.</p> <p>8. A bird's body is specialized for flight.</p> <p>9. Birds have spread to many ecological niches.</p> <p>10. All mammals share several common characteristics.</p> <p>11. Modern mammals are divided into three main groups.</p>	<ul style="list-style-type: none"> • What are the adaptations of a bird? • What are the adaptations of a mammal? 	<p>3.1.10.C3 CONSTANCY AND CHANGE Interpret data from fossil records, anatomy and physiology, and DNA studies relevant to the theory of evolution.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p> <p>3.1.12.A5 Analyze how structure is related to function at all levels of biological organization from molecules to organisms.</p> <p>3.1.12.B2 Evaluate the process of sexual reproduction in influencing genetic variability in a population.</p> <p>3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium).</p> <p>Evaluate survival of the fittest in terms of species that have remained unchanged over long periods of time.</p>	<ul style="list-style-type: none"> • Differentiate among the four groups of modern reptiles. • Describe the relationship between modern birds and extinct theropod dinosaurs. • Explain flight adaptations on birds. • Relate bird adaptations to their ecological niches. • Identify the characteristics of mammals. • Describe the three groups of modern mammals. 		
Chapter 28 - Human Systems and Homeostasis (Weeks 21-22)	<ul style="list-style-type: none"> • The human body has five levels of organization. • Homeostasis is the regulation and maintenance of the internal environment. • Systems interact to maintain homeostasis. 	<ol style="list-style-type: none"> 1. Specialized cells develop from a single zygote. 2. Specialized cells function together in tissues, organs, organ systems, and the whole organisms. 3. Conditions within the body must remain within 	<ul style="list-style-type: none"> • What are some of the reasons that multicellular organisms need specialized cells? • How do tissues differ from organs and organ systems? • Why is it important to 	<p>10.1.2.B1 Identify and describe functions of major body organs and systems.</p> <p>10.1.3.B Identify and know the location and function of the major body organs and systems. circulatory respiratory muscular skeletal digestive</p> <p>3.1.12.A6</p>	<ul style="list-style-type: none"> • Describe cell specialization and level 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 	<p>Students will be given the following:</p> <p>Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>a narrow range.</p> <ol style="list-style-type: none"> Negative feedback loops are necessary for homeostasis. Each organ system affects other organ systems. A disruption of homeostasis can be harmful.. 	<p>maintain homeostasis within the body?</p>	<p>Analyze how cells in different tissues/organs are specialized to perform specific functions.</p> <p>3.1.B.A8 CHANGE AND CONSTANCY Recognize that systems within cells and multicellular organisms interact to maintain homeostasis.</p> <p>PATTERNS Demonstrate the repeating patterns that occur in biological polymers.</p> <p>SYSTEMS Describe how the unique properties of water support life.</p>	<p>maintain homeostasis.</p> <ul style="list-style-type: none"> Describe the interaction between organ systems in terms of homeostasis. Describe the effect of disruption of homeostasis. 		
<p>Chapter 29 - Nervous and Endocrine Systems (Weeks 23-24)</p>	<ul style="list-style-type: none"> 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. Scientists study the function and 	<ol style="list-style-type: none"> The body's communication systems help maintain homeostasis. The nervous and endocrine systems have different methods and rates of communication. The senses help to maintain homeostasis. The senses detect physical and chemical stimuli. The nervous system's two parts work together. The CNS processes information. The PNS links the CNS to muscles and other organs. 	<ul style="list-style-type: none"> How do the central nervous system and peripheral nervous system differ? How does a neuron's shape allow it to send signals across long distances? How do the senses detect the internal and external environments? How do stimulants and depressants affect a neuron's ability to generate impulse? What is a hormone and what role do they play within the body? 	<p>1 0.1.3.B Identify and know the location and function of the major body organs and systems.</p> <p>circulatory respiratory muscular skeletal digestive</p> <p>10.1.6.B Identify and describe the structure and function of the major body systems.</p> <p>nervous muscular integumentary urinary endocrine reproductive immune</p> <p>10.4.6.C Identify and apply ways to monitor and assess the body's response to moderate to vigorous physical activity.</p> <p>heart rate monitoring checking blood pressure fitness assessment</p> <p>3.1.B.A8 CHANGE AND CONSTANCY</p>	<ul style="list-style-type: none"> 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 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. 	<p>Students will be given the following:</p> <p>Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<p>chemistry of the brain.</p> <ul style="list-style-type: none"> The endocrine system produces hormones that affect growth, development, and homeostasis. 	<ol style="list-style-type: none"> New techniques improve our understanding of the brain. Changes in brain chemistry can cause illness. Drugs alter brain chemistry. Hormones influence a cell's activities by entering the cell or binding to its membrane. Endocrine glands secrete hormones that act throughout the body. The hypothalamus interacts with the nervous and endocrine systems Hormonal imbalances can cause serious illness 		<p>Recognize that systems within cells and multicellular organisms interact to maintain homeostasis.</p> <p>PATTERNS Demonstrate the repeating patterns that occur in biological polymers.</p> <p>SYSTEMS Describe how the unique properties of water support life.</p>	<ul style="list-style-type: none"> 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. 		
<p>Chapter 30 - Respiratory and Circulatory Systems (Weeks 25-26)</p>	<ul style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> The respiratory and circulatory systems work together to maintain homeostasis. The respiratory system moves gases into and out of the blood. The circulatory system moves 	<ul style="list-style-type: none"> What is the function of the respiratory system? What is the function of the circulatory system? How does the alveoli's structure relate to the function of gas exchange? How does pulmonary 		<ul style="list-style-type: none"> 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 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<ul style="list-style-type: none"> • 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. 	<p>blood to all parts of the body.</p> <ol style="list-style-type: none"> 4. Gas exchange occurs in the alveoli of the lungs. 5. Respiratory diseases interfere with gas exchange. 6. The tissues and structures 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. 	<p>circulation differ from systemic circulation?</p> <ul style="list-style-type: none"> • What are the components of blood? • How does the lymphatic system supply another type of circulation within the body? 		<p>function of the heart.</p> <ul style="list-style-type: none"> • 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. 		
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		13.The lymphatic system is a major part of the immune system.					
Chapter 31 - Immune System and Disease (Weeks 27-28)	<ul style="list-style-type: none"> • Germs cause many diseases in humans. • The immune system consists of organs, cells, and molecules 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. 	<ol style="list-style-type: none"> 1. Germ theory states that microscopic particles cause certain diseases. 2. There are different types of pathogens. 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 	<ul style="list-style-type: none"> • What are the different types of pathogens and how do they cause a person to become sick? • What are some tissues of the immune system that help to prevent and fight infections? • How do passive and active immunity differ? • What are some similarities between the cellular and humoral responses? • What is a vaccine? • How does an allergen affect the body? 	<p>10.1.3.B Identify and know the location and function of the major body organs and systems. circulatory respiratory muscular skeletal digestive</p> <p>10.1.3.E Identify types and causes of common health problems of children. infectious diseases (e.g., colds, flu, chickenpox) noninfectious diseases (e.g., asthma, hay fever, allergies, lyme disease) germs pathogens heredity</p> <p>10.1.6.B Identify and describe the structure and function of the major body systems. nervous muscular integumentary urinary endocrine reproductive immune</p> <p>10.2.6.E Analyze environmental factors that impact health. indoor air quality (e.g., second- hand smoke, allergens) chemicals, metals, gases (e.g., lead, radon, carbon monoxide) radiation natural disasters</p> <p>3.1.B.A8</p>	<ul style="list-style-type: none"> • Summarize the germ theory. • Describe the different pathogens and the way they enter the body. • 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. • Explain what happens when the immune system responds to harmless antigens. • Describe autoimmune diseases. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> • Preferential seating when applicable. • Study guides. • Guided notes when applicable. • Extended time for assignments when needed. • Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>control pathogens.</p> <p>11. Vaccines artificially produce acquired immunity.</p> <p>12. Allergies occur when the immune system responds to harmless antigens.</p> <p>13. In autoimmune diseases, white blood cells attack the body's healthy cells.</p> <p>14. Leukemia is characterized by abnormal white blood cells.</p> <p>15. HIV targets the immune system.</p>		<p>CHANGE AND CONSTANCY Recognize that systems within cells and multicellular organisms interact to maintain homeostasis.</p> <p>PATTERNS Demonstrate the repeating patterns that occur in biological polymers.</p> <p>SYSTEMS Describe how the unique properties of water support life. 3.4.10.E1 Assess how medical technologies over time have impacted prevention and rehabilitation, vaccines and pharmaceuticals, medical and surgical procedures, and genetic engineering.</p>	<ul style="list-style-type: none"> Identify common autoimmune diseases. Explain what leukemia is and how it weakens the immune system. Summarize how HIV affects the immune system. 		
<p>Chapter 32 - Digestive and Excretory Systems (Weeks 29--30)</p>	<ul style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> Six types of nutrients help to maintain homeostasis. Meeting nutritional needs supports good health. Several digestive organs work together to break down food. Digestion begins in the mouth and continues in the stomach. Digestion is completed in parts of the 	<ul style="list-style-type: none"> What six types of nutrients help maintain homeostasis? What is the function of the digestive system? What are villi and how do they aid in digestion? What is the job of the excretory system? What are nephrons and what job do they carry out in the excretory system? 	<p>10.1.3.B Identify and know the location and function of the major body organs and systems.</p> <p>circulatory respiratory muscular skeletal digestive</p> <p>10.1.3.C Explain the role of the food guide pyramid in helping people eat a healthy diet.</p> <p>food groups number of servings variety of food nutrients</p> <p>10.1.6.B</p>	<ul style="list-style-type: none"> 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 absorbed in the small intestine. Describe water absorption and solid-waste 	<p>Students will be given the following:</p> <p>Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>small intestine.</p> <p>6. Most absorption of nutrients occurs in the small intestine.</p> <p>7. Water is absorbed and solid wastes are eliminated from the large intestine.</p> <p>8. The excretory system eliminates nonsolid wastes from the body.</p> <p>9. The kidneys help maintain homeostasis by filtering the blood.</p> <p>10. Nephrons clean the blood and produce urine.</p> <p>11. Injury and disease can damage kidney functions.</p>		<p>Identify and describe the structure and function of the major body systems.</p> <p>nervous muscular integumentary urinary endocrine reproductive immune</p> <p>10.1.6.C Analyze nutritional concepts that impact health.</p> <p>caloric content of foods relationship of food intake and physical activity (energy output) nutrient requirements label reading healthful food selection</p> <p>3.1.B.A8 CHANGE AND CONSTANCY Recognize that systems within cells and multicellular organisms interact to maintain homeostasis.</p> <p>PATTERNS Demonstrate the repeating patterns that occur in biological polymers.</p> <p>SYSTEMS Describe how the unique properties of water support life.</p>	<p>elimination in the large intestine.</p> <ul style="list-style-type: none"> 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. 		
<p>Chapter 33 - Protection, Support, and Movement (Weeks 31-33)</p>	<ul style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> Your skeletal system is made up of the appendicular and axial skeletons. Bones connect to form joints. Bones are living tissue. Humans have three types of muscles. 	<ul style="list-style-type: none"> What is the difference between the axial and appendicular skeletons? What is the function of joints and ligaments? What are the three types of muscles in the human body? 	<p>10.1.3.B Identify and know the location and function of the major body organs and systems.</p> <p>circulatory respiratory muscular skeletal digestive</p> <p>10.1.6.B Identify and describe the structure and function of the major body systems.</p> <p>nervous muscular</p>	<ul style="list-style-type: none"> 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. 	<p>Students will be given the following:</p> <p>Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<ul style="list-style-type: none"> The integumentary system has many tissues that protect the body. 	<ol style="list-style-type: none"> Muscles contract when the nervous system causes muscle filaments to move. The integumentary system helps maintain homeostasis. The integumentary system consists of many different tissues. 	<ul style="list-style-type: none"> What is the integumentary system and how does it help protect the body? What structures are found in each of the three layers of the skin? 	<p>integumentary urinary endocrine reproductive immune</p> <p>10.4.9.C Analyze factors that affect the responses of body systems during moderate to vigorous physical activities. exercise (e.g., climate, altitude, location, temperature) healthy fitness zone individual fitness status (e.g., cardiorespiratory fitness, muscular endurance, muscular strength, flexibility) drug/substance use/abuse</p>	<ul style="list-style-type: none"> Explain how the integumentary system helps maintain homeostasis. Describe the structure of the integumentary system. 		
Chapter 34 - Reproduction and Development (Weeks 34-36)	<ul style="list-style-type: none"> 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 continues through adolescence and declines with age. 	<ol style="list-style-type: none"> The female reproductive system produces ova. The male reproductive system produces sperm. Eggs mature and are released according to hormonal cycles. Sperm production in the testes is controlled by hormones. Fertilization occurs when a sperm cell joins an egg cell. Sexually transmitted diseases affect fertility and overall health. 	<ul style="list-style-type: none"> How do the male and female reproductive systems differ? What role do hormones play in the reproductive system? When a woman first learns that she is pregnant, what lifestyle changes might she need to make? What happens during the three stages of the birthing process? How does a human's body change as they grow and develop? 	<p>10.1.12.A Evaluate factors that impact growth and development during adulthood and late adulthood. acute and chronic illness communicable and non-communicable disease health status relationships (e.g., marriage, divorce, loss) career choice aging process retirement</p> <p>10.1.12.C Analyze factors that impact nutritional choices of adults. cost food preparation (e.g., time, skills) consumer skills (e.g., understanding food labels, evaluating fads) nutritional knowledge changes in nutritional requirements (e.g., age, physical activity level)</p> <p>10.1.3.B Identify and know the location and function of the major body organs and systems.</p>	<ul style="list-style-type: none"> 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 process. Describe fertilization. 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. 	<p>Students will be given the following:</p> <ul style="list-style-type: none"> Preferential seating when applicable. Study guides. Guided notes when applicable. Extended time for assignments when needed. Separate testing environment when applicable. 	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		<p>7. The fertilized egg implants into the uterus and is nourished by the placenta.</p> <p>8. A zygote develops into a fully formed fetus in about 38 weeks.</p> <p>9. The mother affects the fetus, and pregnancy affects the mother.</p> <p>10. Birth occurs in three stages.</p> <p>11. Human growth and aging also occur in stages.</p>		<p>circulatory respiratory muscular skeletal digestive</p> <p>10.1.6.B Identify and describe the structure and function of the major body systems. nervous muscular integumentary urinary endocrine reproductive immune</p> <p>10.4.12.C Evaluate how changes in adult health status may affect the responses of the body systems during moderate to vigorous physical activity. aging injury disease</p>	<ul style="list-style-type: none"> • Describe the three stages of birth. • Describe the stages of human growth and aging. 		
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