

**FIRST QUARTER TOPICS:**

1. Introduction to Biology
2. Chemistry
3. Cell Structure & Function
4. Biochemistry
5. Digestive System

FOR MORE SUGGESTED RESOURCES GO TO

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Topic	INTRODUCTION TO BIOLOGY: 3 WEEKS	
MA Standards	<ul style="list-style-type: none"> ▶ Scientific Inquiry Skills 1-4 ▶ Mathematical Skills 	
Concepts	<ul style="list-style-type: none"> ▶ THEMES OF BIOLOGY ▶ CHARACTERISTICS OF LIFE ▶ SCIENTIFIC METHOD LAB SAFETY 	<ul style="list-style-type: none"> ▶ SI MEASUREMENT ▶ USE OF MICROSCOPE
Essential Questions	<ul style="list-style-type: none"> ▶ What do biologists study? ▶ What are the necessary characteristics of life? ▶ What are the themes of biology? 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> List six unifying themes of biology. <input type="checkbox"/> Explain how organisms get the energy they need to survive. <input type="checkbox"/> Describe the main difference between the structure of a living thing and that of a nonliving thing. <input type="checkbox"/> List six characteristics of life <input type="checkbox"/> Describe the hierarchy in nature from atoms to biome <input type="checkbox"/> Define and give examples of observing, measuring, organizing, and analyzing data, inferring, and modeling. <input type="checkbox"/> Explain the relationship between hypothesizing, predicting, and experimenting. <input type="checkbox"/> Compare light microscopes with electron microscopes in terms of magnification and resolution. <input type="checkbox"/> Explain the advantages of the Système International d'Unités. <p>*Modified from <i>Modern Biology</i>(2002)</p>	
Resources	<p>Textbook: <i>Modern Biology</i>(2002)</p> <p>Scientific Method Graphic Organizer</p> <p>Reading: Chapter 1: <i>The Science of Life</i></p>	
Lecture Notes	<p>Study of Life Notes-Massengale</p> <p>Identifying Controls and Variables</p> <p>Chapter 1 Powerpoint</p> <p>The Levels of Organization.</p>	
Labs/Activities	<ul style="list-style-type: none"> ▶ A2: Comparing living and nonliving things ▶ Characteristics of Life Concept Map-GROUCH ▶ Lab C1: Microscope ▶ Safety Contract and Quiz ▶ SI Measurement Lab ▶ Characteristics of Life Concept Map ▶ Identifying Controls and Variables 	<ul style="list-style-type: none"> ▶ The Language of Science ▶ Parts of the Microscope ▶ Microscope Lab ▶ Metric Measurement Lab ▶ Making Inferences ▶ The Martian and the Car
Homework	<ul style="list-style-type: none"> <input type="checkbox"/> Sections Review Questions <input type="checkbox"/> Vocabulary <input type="checkbox"/> Chapter Review Questions <input type="checkbox"/> Directed Reading Questions 	<ul style="list-style-type: none"> <input type="checkbox"/> Study Guide Worksheets 1-1 Worksheet 1-2 Worksheet 1-3 Worksheet 1-4 Worksheet
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Chapter 1 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab Safety Pretest <input type="checkbox"/> Lab Practical on Lab Safety and Equipment 	



Topic	CHEMISTRY: 1 WEEK	
MA Standards	The Chemistry of Life 1.1: BASIC CHEMISTRY <ul style="list-style-type: none"> ▶ Recognize that biological organisms are composed primarily of very few elements. ▶ The six most common are C, H, N, O, P, S. SIS1-2	
Concept	Chemical elements form organic molecules that interact to perform the basic functions of life	
Essential Questions	<ul style="list-style-type: none"> ▶ How do elements combine to form organic molecules? ▶ Why are organic molecules the chemistry of life? ▶ How is all life affected by chemical reactions? 	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Define <i>element, atom, compound, and molecule.</i> <input type="checkbox"/> Explain models of the atomic structure of the six most common elements-C, H, O, N, P, and S, found in living organisms. <input type="checkbox"/> Explain what determines an atom's stability. <input type="checkbox"/> Contrast ionic and covalent bonds. <input type="checkbox"/> Define reaction and be able to identify reactants and products in a chemical equation. <input type="checkbox"/> Describe how energy changes are involved in chemical reactions. (activation energy) <input type="checkbox"/> Explain how enzymes affect chemical reactions in organisms. <input type="checkbox"/> Define <i>solution, solute, solvent, and concentration.</i> <input type="checkbox"/> Understand the role of pH and buffers in living things. 	
Resources	Textbook: <i>Modern Biology(2002)</i> Reading: Chapter 2-Chemistry	
Lecture Notes	<ul style="list-style-type: none"> ▶ Chapter 2 Notes. ▶ Chemistry PPT ▶ Periodic Table of Elements. 	
Labs/Activities	<ul style="list-style-type: none"> ▶ Making Models ▶ Lab: Solutions ▶ Lab: ph 	<ul style="list-style-type: none"> ▶ Adopt an Element ▶ Giant Periodic Table
Homework	<ul style="list-style-type: none"> ▶ Sections Review 2-1-3 ▶ Study Guide Worksheets ▶ 2-1 Worksheet 	<ul style="list-style-type: none"> ▶ 2-2 Worksheet ▶ 2-3 Worksheet ▶ Chapter Review Questions
Assessment	<ul style="list-style-type: none"> ▶ Warm-ups: <i>help to check for prior knowledge or understanding of previous day's lesson</i> ▶ Chapter 2 Test ▶ Exam Pro Test Questions ▶ Lab reports 	<ul style="list-style-type: none"> ▶ Lab rubric ▶ Homework Rubric ▶ School Wide Rubric



Topic	BIOCHEMISTRY: 2 WEEKS	
MA Standards	1.2 ORGANIC MOLECULES Describe the basic molecular structures and primary functions of the four major categories of organic molecules: <ul style="list-style-type: none"> ▶ carbohydrates ▶ lipids ▶ proteins ▶ nucleic acids 	
Concepts	Chemical elements form organic molecules that interact to perform the basic functions of life	
Essential Questions	<ul style="list-style-type: none"> ▶ Why is carbon an important element to all living organisms ▶ How are organic molecules and their structure the basis of living organisms 	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Describe the polar nature of water and how this property of water affects its ability to dissolve substances. <input type="checkbox"/> Define <i>organic compounds</i> and name six elements often found in organic compounds. <input type="checkbox"/> Explain why carbon forms so many different compounds. <input type="checkbox"/> Give examples of and describe the basic molecular structure and function of: <ul style="list-style-type: none"> • carbohydrates • lipids • proteins • nucleic acids <input type="checkbox"/> Explain how different processes need a constant supply 	
Resources	Textbook: <i>Modern Biology(2002)</i> Reading: Chapter 3-Biochemistry	
Lecture Notes	PPT: Properties of Water Carbon Compounds PPT Biochemistry PPT	
Suggested Labs/Activities	<ul style="list-style-type: none"> ▶ Organic Molecules Concept Map ▶ Organic Molecules Review Worksheet ▶ Food Chemistry Lab 	<ul style="list-style-type: none"> ▶ Constructing Organic Molecules Collins Brainstorm
Homework	Keywords Section Reviews: 1-3 Chapter Review Questions Organic Molecules Graphic Organizer	3-1 Worksheet 3-2 Worksheet 3-3 Worksheet
Assessment	<ul style="list-style-type: none"> ▶ Collins: Organic Molecules ▶ Chapter 4 Test ▶ Exam Pro Test Questions with Essays & Problems 	<ul style="list-style-type: none"> ▶ Lab rubric ▶ Homework Rubric ▶ School Wide Rubric ▶ Lab reports



Topic	ANATOMY & PHYSIOLOGY: DIGESTIVE SYSTEM: 1 WEEK	
MA Standards	Anatomy and physiology 4.1 Digestive System <ul style="list-style-type: none"> ▶ Explain generally how the digestive system (mouth, pharynx, esophagus, stomach, small and large intestines, rectum) converts macromolecules from food into smaller molecules that can be used by cells for energy and for repair and growth. 	
Concepts	<ul style="list-style-type: none"> ▶ Central Concepts: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism. Homeostasis allows the body to perform its normal functions. 	
Essential Questions	<ul style="list-style-type: none"> ▶ How does the digestive system break down food into organic molecules and provide energy for living organisms 	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> List the major organs of the digestive system <input type="checkbox"/> Relate the structure of each organ with its function in mechanical digestion <input type="checkbox"/> Identify the source of each major digestive enzyme, and describe the function of the enzyme <input type="checkbox"/> Summarize the process of absorption in both the small and large intestine 	
Resources	<i>Modern Biology</i> (2002) Reading chapter 49-1,2	
Lecture Notes	Digestive PPT	
Labs/Activities	<ul style="list-style-type: none"> ▶ Digestive Travel Brochure ▶ McMush Lab 	<ul style="list-style-type: none"> ▶ Food Chemistry ▶ Digestive System Webquest
Homework	<ul style="list-style-type: none"> ▶ Section Reviews ▶ Keywords ▶ Chapter Review 	
Assessment	Chapter Test Collins: The Digestive System Lab Report Homework Rubric	



Topic	CELL STRUCTURE & FUNCTION: 2 WEEKS	
MA Standards	<ul style="list-style-type: none"> ▶ 2.1: CELL ORGANELLES <ul style="list-style-type: none"> ▶ <u>Relate cell parts/organelles</u> –(plasma membrane, nuclear envelope, nucleus, nucleolus, cytoplasm, mitochondrion, endoplasmic reticulum, Golgi apparatus, lysosome, ribosome, vacuole, cell wall, chloroplast, cytoskeleton, centriole, cilium, flagellum, pseudopod) <u>to their functions.</u> ▶ Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, facilitated diffusion, and active transport). ▶ 2.2: PROKARYOTES/EUKARYOTES <ul style="list-style-type: none"> ▶ Compare and contrast, at the cellular level, prokaryotes and eukaryotes (general structures and degrees of complexity). 	
Concept	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	<ul style="list-style-type: none"> ▶ Why are cells considered the basic unit of structure of life? ▶ How does life at the cellular level affect life at levels further up in the hierarchy of life? 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> State the cell theory. <input type="checkbox"/> Describe the relationship between cell shape and cell function. <input type="checkbox"/> Distinguish between prokaryotes and eukaryotes. <input type="checkbox"/> Describe the structure, composition, and function of the cell membrane. <input type="checkbox"/> Name the major organelles found in a eukaryotic cell, and describe their structure functions. <input type="checkbox"/> Explain how chloroplasts and mitochondria are related. <input type="checkbox"/> Describe additional three structures characteristic of plant cells. <input type="checkbox"/> Distinguish between tissues, organs, and organ systems. 	
Resources	<p>Textbook: <i>Modern Biology(2002)</i></p> <p>Reading: Chapter 4: Structure and Function of the Cell</p>	
Lecture Notes	Chapter 4: The Cell Notes Cells Alive WEBSITE Amazing Cell Video	Cell Overview PPT Tour of The Cell PPT
Labs/Activities	<ul style="list-style-type: none"> ▶ Cell Web Quest GO ▶ Cell Analogy Project ▶ Cell Analogy Collage 	<ul style="list-style-type: none"> ▶ Cell Model ▶ Lab: Observing Specialized Cells
Homework	<ul style="list-style-type: none"> ▶ Sections Review 4-1-2 ▶ Chapter Review Questions ▶ Keywords 	<ul style="list-style-type: none"> ▶ Study Guide Worksheets ▶ 4-1 Worksheet ▶ 4-2 Worksheet
Assessment	<ul style="list-style-type: none"> ▶ Warm-ups: <i>help to check for prior knowledge or understanding of previous day's lesson</i> ▶ Collins: Comparing and Contrasting Prokaryotic and Eukaryotic Cells ▶ Collins: Comparing and Contrasting Plant and Animal Cells ▶ Collins: Compare and Contrast 2 cell organelles 	<ul style="list-style-type: none"> ▶ Lab reports ▶ Lab rubric ▶ Homework Rubric ▶ School Wide Rubric ▶ Chapter 4 Test ▶ Exam Pro Test Questions



Second Quarter Topics:

1. Cell Transport
2. Photosynthesis & Respiration
3. Circulatory & Respiratory System
4. Cell Reproduction
5. Human Reproduction
6. Genetics

Topic	CELL TRANSPORT: 1 WEEK	
MA Standards	<ul style="list-style-type: none"> ▶ 2.1: CELL TRANSPORT <ul style="list-style-type: none"> ▶ Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, facilitated diffusion, and active transport). 	
Concepts	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	<ul style="list-style-type: none"> ▶ How is the structure of the cell membrane related to its function? ▶ Explain two important functions of the cell membrane 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Explain how equilibrium is established as a result of diffusion <input type="checkbox"/> Distinguish between diffusion and osmosis <input type="checkbox"/> Explain how substances cross the cell membrane through facilitated diffusion. <input type="checkbox"/> Explain how ion channels assist the diffusion of ions across the cell membrane. <input type="checkbox"/> Distinguish between passive and active transport. <input type="checkbox"/> Describe the sodium-potassium pump. <input type="checkbox"/> Compare and contrast endocytosis and exocytosis. <input type="checkbox"/> List types of active and passive transport with examples. 	
Resources	<p>Textbook: <i>Modern Biology (2002)</i></p> <p>Reading: Chapter 5: Homeostasis and Transport</p>	
Lecture Notes	<p>Homeostasis and Cell Transport Notes</p> <p>Cell Membranes and Transport PPT</p> <p>Osmosis and Diffusion Notes</p>	
Labs/Activities	Lab: Diffusion and Osmosis	▶
Homework	<ul style="list-style-type: none"> ▶ Read Chapter 5 ▶ Section Review Questions ▶ Keywords 	<ul style="list-style-type: none"> ▶ 5.1 Worksheet ▶ 5.2 Worksheet ▶ Transport Graphic Organizer
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Collins: Diffusion and Osmosis Lab Report <input type="checkbox"/> Chapter 5 Test <input type="checkbox"/> Exam Pro Test Questions 	<ul style="list-style-type: none"> <input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric <input type="checkbox"/> Lab reports



Topic	PHOTOSYNTHESIS: 1 WEEK	
MA Standards	2.4 PHOTOSYNTHESIS <ul style="list-style-type: none"> ▶ Identify the reactants, products, and basic purposes of photosynthesis and cellular respiration. ▶ Explain the interrelated nature of photosynthesis and cellular respiration in the cells of photosynthetic organisms. 	
Concepts	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	<ul style="list-style-type: none"> ▶ Why is photosynthesis a process that is essential to all life. ▶ How is the sun's energy converted into organic molecules 	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Explain the purpose of photosynthesis. <input type="checkbox"/> Identify the reactants and products of photosynthesis. <input type="checkbox"/> Explain the role of the chloroplast in photosynthesis. <input type="checkbox"/> Describe the role of chlorophylls and other pigments in photosynthesis. <input type="checkbox"/> *Explain how environmental factors influence photosynthesis(OPTIONAL) 	
Resources	<i>Modern Biology (2002)</i> Reading: Chapter 6: Photosynthesis	
Lecture Notes:	<ul style="list-style-type: none"> ▶ Photosynthesis notes from Web ▶ Photosynthesis PPT ▶ Photosynthesis Overview 	<ul style="list-style-type: none"> ▶ Photosynthesis Worksheet ▶ Campbell Photosynthesis PPT ▶ Prentice Hall Photosynthesis Tutorial
Labs/Activities	Lab: MB Chromatography Photosynthesis Colorings Photosynthesis Cards	
Homework	<ul style="list-style-type: none"> • Sections Reviews 6-1-2 • Chapter Review Questions 	<ul style="list-style-type: none"> • 6-1 Worksheet • 6-2 Worksheet
Assessment	Chapter 6 Assessment /MCAS Questions	Exam Pro Questions

Topic	CELL RESPIRATION: 1 WEEK	
MA Standards	2.4 RESPIRATION <ul style="list-style-type: none"> ▶ Identify the reactants, products, and basic purposes of photosynthesis and cellular respiration. ▶ Explain the interrelated nature of photosynthesis and cellular respiration in the cells of photosynthetic organisms. 	
Concepts	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	<ul style="list-style-type: none"> ▶ Explain the importance of how cell respiration produces energy for living organisms. ▶ Explain why photosynthesis and cell respiration are considered biochemical pathways 	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Explain the purpose of cellular respiration <input type="checkbox"/> List the reactants and products of cellular respiration. <input type="checkbox"/> Describe the major events in glycolysis and where it occurs. <input type="checkbox"/> Distinguish between aerobic and anaerobic respiration. <input type="checkbox"/> Identify the role of mitochondria in aerobic respiration. <input type="checkbox"/> Compare and contrast photosynthesis and cellular respiration <input type="checkbox"/> Explain that the products of photosynthesis become the reactants of cellular respiration. – Biochemical pathways. 	
Resources	<i>Modern Biology (2002)</i> Reading: Chapter 7: Cell Respiration	
Lecture Notes:	<ul style="list-style-type: none"> ▶ Cell Respiration Notes from Web ▶ BiologyZone Cell Respiration PPT 	<ul style="list-style-type: none"> ▶ PH Cell Respiration Concepts ▶ Cell Respiration Worksheet
Labs/Activities	<ul style="list-style-type: none"> • Lab: MB Chromatography • Photosynthesis Colorings • Photosynthesis Cards 	
Homework	<ul style="list-style-type: none"> • Sections Reviews -7-1-2 • 7-1 Worksheet 	<ul style="list-style-type: none"> • 7-2 Worksheet • Chapter Review Questions
Assessment	Chapter 7 Assessment /MCAS Questions	Exam Pro Questions



Topic	CELL REPRODUCTION: 2 WEEKS	
MA Standards	2.6 MITOSIS ▶ Describe the cell cycle and the process of mitosis. ▶ Explain the role of mitosis in the formation of new cells, and its importance in maintaining chromosome number during asexual reproduction. 2.7 MEIOSIS ▶ Describe how the process of meiosis results in the formation of haploid cells.	
Concepts	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	▶ Compare and contrast mitosis and meiosis	
Performance Objectives	Students will be able to: <input type="checkbox"/> Describe the purpose of mitosis and identify cells that undergo mitosis. <input type="checkbox"/> Describe each phase of the cell cycle <input type="checkbox"/> Summarize the phases of mitosis. <input type="checkbox"/> Describe the structure of a chromosome. <input type="checkbox"/> Compare prokaryotic chromosomes with eukaryotic chromosomes. <input type="checkbox"/> Explain the differences between sex chromosomes and autosomes. <input type="checkbox"/> Give examples of diploid and haploid cells. <input type="checkbox"/> Describe the events of binary fission. <input type="checkbox"/> Compare cytokinesis in animal cells with cytokinesis in plant cells. <input type="checkbox"/> Describe the purpose of meiosis and identify cells that undergo meiosis. <input type="checkbox"/> List and describe the phases of meiosis. <input type="checkbox"/> Compare the end products of mitosis with those of meiosis. <input type="checkbox"/> Explain crossing-over and how it contributes to the production of unique individuals. <input type="checkbox"/> Compare and contrast the results of spermatogenesis and oogenesis.	
Resources	Modern Biology (2002) Reading: Chapter 8: Cell Reproduction	
Lecture Notes	Cell Cycle PPT Cell Division Notes-Massengale	Cell Growth and Division PPT Animal Cell Mitosis Plant Cell Mitosis
Labs/Activities	▶ Mitosis/Meiosis drawings ▶ Lab: Mitosis string ▶ Lab B5: Mitosis	▶ Computer Lab: Mitosis and Meiosis in Motion ▶ Mitosis/Meiosis Flipbooks
Homework	▶ 8-1 Worksheet ▶ 8-2 Worksheet ▶ 8-3 Worksheet	▶ Chapter Review Questions ▶ Sections Reviews 8-1-2
Assessment	<input type="checkbox"/> Collins: The Cell Cycle <input type="checkbox"/> Chapter 8 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports	<input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Topic	REPRODUCTIVE SYSTEM: 1 WEEK	
MA Standards	4.6 Reproductive system ▶ Recognize that the sexual reproductive system allows organisms to produce offspring that receive half of their genetic information from their mother and half from their father and that sexually produced offspring resemble, but are not identical to, either of their parents.	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Describe the structure of a human sperm <input type="checkbox"/> Describe the structure and function of each major part of the human male reproductive system. <input type="checkbox"/> Trace the path that sperm follow in leaving the body. <input type="checkbox"/> Compare eggs with sperm <input type="checkbox"/> Describe the structure and function of each major part of the human female reproductive system. <input type="checkbox"/> Describe the menstrual cycle and how it is regulated. 	
Resources	<i>Modern Biology (2002)</i> Reading: Chapter 52 reproductive system	
Lecture Notes	Chapter 52 PPT	
Labs/Activities	▶	▶
Homework		
Assessment	□	



Topic	MENDELIAN GENETICS: 3 WEEKS	
MA Standards	3.5 MENDEL'S LAWS ▶ Describe how Mendel's laws of segregation and independent assortment can be observed through patterns of inheritance (such as dihybrid crosses). 3.6 PUNNETT SQUARES ▶ Use a Punnett Square to determine the probabilities for genotype and phenotype combinations in monohybrid crosses.	
Concepts	▶ Genes allow for the storage and transmission of genetic information. They are a set of instructions encoded in the nucleotide sequence of each organism. Genes code for the specific sequences of amino acids that comprise the proteins that are characteristic of that organism.	
Essential Questions	▶ Explain how patterns of inheritance do not always follow Mendel's laws of inheritance	
Performance Objectives	Students will be able to: <input type="checkbox"/> Describe the steps involved in Mendel's experiments on garden peas. <input type="checkbox"/> Define, differentiate and give examples of the following terms: ○ Allele/gene ○ Incomplete dominance/codominance ○ Heterozygous/homozygous ○ Phenotype/genotype <input type="checkbox"/> Distinguish between dominant and recessive traits. <input type="checkbox"/> State the laws of heredity that were developed from Mendel's work. <input type="checkbox"/> Describe how Mendel's results can be explained by scientific knowledge of genes and chromosomes. <input type="checkbox"/> Explain how probability is used to predict the results of genetic crosses. <input type="checkbox"/> Use a Punnett square to predict the results of monohybrid and dihybrid genetic crosses. <input type="checkbox"/> Explain how a testcross is used to show the genotype of an individual whose phenotype is dominant. <input type="checkbox"/> Explain how Mendel's laws can be demonstrated with pun	
Resources	<i>Modern Biology (2002)</i> Reading: Chapter 9: Fundamentals of Genetics	
Lecture Notes	Genetics Notes (Massengale) Mendel's Genetics PPT	
Labs/Activities	Lab: Genetic Traits MB Labs C12, 13,14; E5	Modeling Genetics: Paper Pets Quick Lab p.173 (2002)
Homework	Sections Reviews Vocabulary Chapter Review Questions	Study Guide Worksheets 9-1 Worksheet 9-2 Worksheet
Assessment	<input type="checkbox"/> Collins: The Cell Cycle <input type="checkbox"/> Chapter 9 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports	<input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Topic	PATTERNS OF INHERITANCE: 1 WEEK	
MA Standards	<p>3.3 MUTATIONS</p> <ul style="list-style-type: none"> ▶ Explain how mutations in the DNA sequence of a gene may or may not result in phenotypic change in an organism. ▶ Explain how mutations in gametes may result in phenotypic changes in offspring. <p>3.4 INHERITANCE PATTERNS</p> <ul style="list-style-type: none"> ▶ Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, incomplete dominance, codominant, sex-linked, polygenic, and multiple alleles). 	
Concepts	▶	
Essential Questions	<ul style="list-style-type: none"> ▶ How do mutations contribute to genetic variation? ▶ Describe how patterns of inheritance contribute to genetic disorders 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Describe how sex linkage affects the inheritance of traits. <input type="checkbox"/> Explain the effect of crossing-over on the inheritance of genes in linkage groups. <input type="checkbox"/> Distinguish between chromosome mutations and gene mutations. <input type="checkbox"/> Define <i>pedigree</i> <input type="checkbox"/> Show how pedigree analysis can be used to illustrate the inheritance of traits. <input type="checkbox"/> Explain the inheritance of ABO blood groups. 	
Resources	<p>Modern Biology (2002) Reading: Chapter 12: Inheritance Patterns and Human Genetics</p>	
Lecture Notes	<p>Gene Mutation Notes(Masengale)</p>	
Labs/Activities	<ul style="list-style-type: none"> ▶ MB Lab C15 ▶ Blood Typing Lab/Glencoe Virtual 	<ul style="list-style-type: none"> ▶ Human disorder Webquest ▶ Genetic Disorder Brouchure
Homework	<ul style="list-style-type: none"> ▶ Sections Reviews ▶ Vocabulary 	<ul style="list-style-type: none"> ▶ Chapter Review Questions ▶ Study Guide Worksheets
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Chapter 12 Test <input type="checkbox"/> Quiz: Sex-linked traits <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports 	<ul style="list-style-type: none"> <input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric

**THIRD QUARTER TOPICS:**

1. Protein Synthesis
2. Evolution
3. Classification

Topic	STRUCTURE OF DNA AND RNA; PROTEIN SYNTHESIS: 2 WEEKS	
MA Standards	<p>STRUCTURE OF DNA & RNA</p> <ul style="list-style-type: none"> ▶ Describe the basic structure (double helix, sugar/phosphate backbone, linked by complementary nucleotide pairs) of DNA ▶ Describe its function in genetic inheritance <p>REPLICATION, TRANSCRIPTION AND TRANSLATION</p> <ul style="list-style-type: none"> ▶ Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic code. ▶ Explain the basic processes of transcription and translation, and how they result in the expression of genes. ▶ Distinguish among the end products of replication, transcription, and translation. 	
Concepts	<ul style="list-style-type: none"> ▶ Broad Concept: Genes allow for the storage and transmission of genetic information. They are a set of instructions encoded in the nucleotide sequence of each organism. Genes code for the specific sequences of amino acids that comprise the proteins that are characteristic of that organism. 	
Essential Questions	<ul style="list-style-type: none"> ▶ How is the structure of DNA related to its function of storing genetic information and controlling the activities of the cell ▶ What is RNA's role in protein synthesis 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Explain the principal function of DNA. <input type="checkbox"/> Describe the structure of DNA: <ul style="list-style-type: none"> • double helix • sugar/phosphate backbone • complementary nucleotide pairs <input type="checkbox"/> Explain the role of complementary base pairing in the replication of DNA. <input type="checkbox"/> Explain the main process of DNA replication. <input type="checkbox"/> Explain the primary function of RNA. <input type="checkbox"/> Compare the structure of RNA with that of DNA. <input type="checkbox"/> Describe the structure and function of each type of RNA. <input type="checkbox"/> Explain the process of transcription. <input type="checkbox"/> Describe the genetic code. <input type="checkbox"/> Explain the roles of the start codon and stop codon. <input type="checkbox"/> Explain the process of translation. 	
Resources	<p>Modern Biology (2002) Reading: Chapter 10: Nucleic Acids and Protein Synthesis</p>	
Lecture Notes	<p>Genetics Notes (Massengale) Mendel's Genetics PPT</p>	
Labs/Activities	<p>Lab: Genetic Traits MB Labs C12, 13,14; E5</p>	<ul style="list-style-type: none"> ▶ Modeling Genetics: Paper Pets ▶ Quick Lab p.173 (2002)
Homework	<p>Sections Reviews Vocabulary Chapter Review Questions</p>	<p>Study Guide Worksheets 10-1 Worksheet 10-2 Worksheet</p>
Assessment	<ul style="list-style-type: none"> ▶ Collins: Compare and Contrast DNA and RNA ▶ Chapter 10 Test ▶ Exam Pro Test Questions ▶ 	<ul style="list-style-type: none"> ▶ Lab rubric ▶ Homework Rubric ▶ School Wide Rubric ▶ Lab reports



Topic	EVOLUTION-HISTORY OF LIFE: 1 WEEK	
MA Standards	5. Evolution and Biodiversity Broad Concept: Evolution is the result of genetic changes that occur in constantly changing environments. Over many generations, changes in the genetic make-up of populations may affect biodiversity through speciation and extinction.	
Concepts	<ul style="list-style-type: none"> ▶ Origin of life ▶ First Cells-Prokaryotes 	
Essential Questions	<ul style="list-style-type: none"> ▶ How do scientists give evidence for the origin of life? ▶ What is the best theory for the formation of life's first organisms? 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Define <i>spontaneous generation</i> and list some of the observations that led people to think that life could arise from nonliving things. <input type="checkbox"/> Define <i>biogenesis</i> <input type="checkbox"/> Briefly describe the modern scientific understanding of the formation of Earth. <input type="checkbox"/> Explain the relationship between chloroplasts and mitochondria. <input type="checkbox"/> Define <i>endosymbiosis</i>, and explain why it is important in the history of eukaryotes 	
Resources	<i>Modern Biology(2002)</i> Reading: Chapter 14: Origin of Life Sections 14-1 &14-2 PP. 270 & 272	
Lecture Notes	Origin of Life PPT Myths About Evolution Origin of Life-Chapter 14	
Labs/Activities	MB: Making Microspheres PBS Video: Origins I & II	
Homework	Sections Reviews Vocabulary Chapter Review Questions	Study Guide Worksheets 14-1 Worksheet 14-2 Worksheet
Assessment	Collins: Compare Spallanzani, Redi's and Pasteur's Theories Chapter 14 Test Exam Pro Test Questions Lab reports	Lab rubric Homework Rubric LEHS School Wide Rubric



Topic	EVOLUTION AND BIODIVERSITY: 2 WEEKS	
MA Standards	5.1: EVIDENCE FOR EVOLUTION <ul style="list-style-type: none"> ▶ Explain how evolution is demonstrated by evidence from the fossil record, comparative anatomy, genetics, molecular biology, and examples of natural selection 	
Concepts	<ul style="list-style-type: none"> ▶ Natural Selection ▶ Descent with Modification 	
Essential Questions	<ul style="list-style-type: none"> ▶ How does the environment influence “survival of the fittest”? ▶ How has Darwin’s theories of evolution changed scientific thought on the diversity of life? 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Define <i>fossil</i>, and tell how the examination of fossils led to the development of evolutionary theories. <input type="checkbox"/> Using the law of superposition explain how biogeographic observations suggest descent with modification <input type="checkbox"/> Define <i>evolution</i>. <input type="checkbox"/> List some of the evidence that led Darwin to his idea of how species might change over time. <input type="checkbox"/> Explain Darwin’s two major theories. <input type="checkbox"/> Describe the difference between homologous, analogous, and vestigial structures. <input type="checkbox"/> Tell how similarities in macromolecules and embryos of different species provide evidence for evolution. <input type="checkbox"/> Describe the four pieces of evidence for evolution. <input type="checkbox"/> Explain the difference between coevolution, and divergent and convergent evolution 	
Resources	<i>Modern Biology(2002)</i> Reading: Chapter 15: Evolution Evidence and Theory	
Lecture Notes	Evolution Notes-Massengale Biology Zone Evolution PPT PBS Evolution Videos Chapter 15 PPT Evolution PPT	
Labs/Activities	MB Lab: A9, A11 MB: B8 Fossil Study	Lab: Natural Selection Collins Brainstorm
Homework	Sections Reviews Vocabulary Chapter Review Questions	Study Guide Worksheets 15-1 Worksheet 15-2 Worksheet 15-3 Worksheet
Assessment	Collins: Comparing Darwin and Lamarck Chapter 15 Test Exam Pro Test Questions	Lab rubric Homework Rubric School Wide Rubric



Topic	POPULATION GENETICS: FIT IN CONCEPTS WITH EVOLUTION	
MA Standards	5.2 POPULATIONS AND SPECIATION ▶ Describe species as reproductively distinct groups of organisms. ▶ Describe the role that geographic isolation can play in speciation. 5.3 NATURAL SELECTION ▶ Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity from a population	
Concepts	▶	
Essential Questions	▶	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Define <i>population genetics, gene pool, and allele frequency.</i> <input type="checkbox"/> Explain conditions that can cause evolution and changes in population: <ul style="list-style-type: none"> ○ mutation ○ migration ○ genetic drift ○ nonrandom mating ○ natural selection <input type="checkbox"/> Contrast the effects of stabilizing, directional, and disruptive selection on variations in a trait over time. <input type="checkbox"/> Explain how <i>geographic and reproductive isolation</i> can lead to speciation. <input type="checkbox"/> Summarize the punctuated equilibrium hypothesis, and contrast it with the hypothesis of gradual change. 	
Resources	<i>Modern Biology (1993)</i> Reading: Chapter 16: Evolution of Populations and Speciation	
Lecture Notes	Population Genetics Notes Populations Evolution PPT	
Labs/Activities	▶ Quick Lab p. 306 ▶ MB Lab B9	▶
Homework	▶ Sections Reviews ▶ Vocabulary ▶ Chapter Review Questions	▶ Chapter Review Questions ▶ Study Guide Worksheets ▶ Study Guide Worksheets
Assessment	<input type="checkbox"/> Collins: Causes of Variation in Populations <input type="checkbox"/> Chapter 16 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports	<input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Topic	CLASSIFICATION/TAXONOMY: 2 WEEKS	
MA Standards	<p>5.2 CLASSIFICATION</p> <ul style="list-style-type: none"> ▶ Describe species as reproductively distinct groups of organisms. ▶ Recognize that species are further classified into a hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. <p>2.3 CELLULAR EVIDENCE FOR 6 KINGDOMS</p> <ul style="list-style-type: none"> ▶ Use cellular evidence: <ul style="list-style-type: none"> ○ cell structure ○ cell number, ○ cell reproduction ○ modes of nutrition <p>to describe the six kingdoms (Archaeobacteria, Eubacteria, Protista, Fungi, Plantae, Animalia).</p>	
Concepts	▶ Evolutionary relationships and how they are used to classify organisms	
Essential Questions	▶ What methods are used to classify organisms?	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Describe the three-domain system of classification. <input type="checkbox"/> Explain Linnaeus's system of classification, and identify the main criterion he used to classify organisms. <input type="checkbox"/> List Linnaeus's levels of classification from the most general to the most specific. <input type="checkbox"/> Explain binomial nomenclature <input type="checkbox"/> Name the primary criterion that modern taxonomists consider when they classify organisms. (DNA) <input type="checkbox"/> Define <i>phylogenetic tree</i>, and explain what information a phylogenetic tree shows. <input type="checkbox"/> List four types of evidence used to organize organisms in systemic taxonomy. <input type="checkbox"/> Explain cladistic taxonomy, and identify one conclusion that is in conflict with classical, systemic taxonomy. <input type="checkbox"/> Describe primary characteristics of the six kingdom classification system and list examples of organisms from each of the six kingdoms. <input type="checkbox"/> Describe phylogenetic trees and cladistic taxonomy in terms of evolutionary taxonomy. <input type="checkbox"/> Read a cladogram. 	
Resources	<p><i>Modern Biology(2002)</i> Reading: Chapter 18: Classification Creating Order Out of Chaos p. 340-341</p>	
Lecture Notes	Classification PPT Dichotomous Keying	Classification Notes-Massengale Classification Review Notes
Labs/Activities	<ul style="list-style-type: none"> ▶ MB A15 ▶ MB A11 ▶ Classification Web quest 	<ul style="list-style-type: none"> ▶ Classifying Animals ▶ Quick Lab p. 338 ▶ Timeline: pp 341-342
Homework	Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets	
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Collins: Compare and Contrast 6 Kingdom and 3 Domain Classification Systems <input type="checkbox"/> Chapter 18 Test <input type="checkbox"/> School Wide 	<ul style="list-style-type: none"> <input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports



Topic	CLASSIFICATION: BACTERIA-FIT IN WITH CLASSIFICATION	
MA Standards	<p>5.2: Evolution and Diversity</p> <ul style="list-style-type: none"> ▶ Describe species as reproductively distinct groups of organisms. ▶ Recognize that species are further classified into a hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. <p>2.3: CELLULAR EVIDENCE FOR 6 KINGDOMS</p> <ul style="list-style-type: none"> ▶ Use cellular evidence (such as cell structure, cell number, and cell reproduction) and modes of nutrition to describe six kingdoms <p>2.8: Compare and contrast a virus and a cell in terms of genetic material and reproduction</p>	
Concepts	▶ Bacteria	
Essential Questions	▶ Compare and contrast similarities and differences of viruses and bacteria	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Define <i>bacteria</i>, <i>eubacteria</i>, and <i>archaeobacteria</i>, and note the relationships between them. <input type="checkbox"/> Describe the methods used to classify bacteria. <input type="checkbox"/> Describe the significance of cyanobacteria in the formation of the Earth's present atmosphere. <input type="checkbox"/> Describe the structure of a bacterial cell. <input type="checkbox"/> Compare the heterotrophic modes of nutrition in bacteria with the autotrophic modes. <input type="checkbox"/> Specify how antibiotic resistance has come about, and describe ways that bacteria resist antibiotics. <input type="checkbox"/> Describe bacteria reproduction in the forms of binary fission and conjugation. 	
Resources	<p><i>Modern Biology(2002)</i></p> <p>Reading: Chapter 24: Bacteria</p>	
Lecture Notes	<p>Bacteria Notes</p> <p>Bacteria PPT</p>	
Labs/Activities	Bacteria Cultures	
Homework	Sections Reviews Vocabulary Chapter Review Questions	Study Guide Worksheets 24-1 Worksheet 24-2 Worksheet 24-3 Worksheet
Assessment	Chapter 24 Test Collins: C/C Bacteria and Viruses Exam Pro Test Questions Lab Report Lab Rubric	Collins: Is It Alive? Collins: C/C Harmful and Helpful Bacteria Homework Rubric School Wide Rubric



Topic	VIRUSES: FIT IN WITH CLASSIFICATION	
MA Standards	2.8 VIRUSES ▶ Compare and contrast a virus and a cell in terms of genetic material and reproduction .	
Concepts	Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction	
Essential Questions	▶ Are viruses living or non-living? What characteristics do they have in common with other living organisms?	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Describe the structure and classification of viruses. <input type="checkbox"/> Summarize the five phases of the lytic cycle. <input type="checkbox"/> Summarize how viruses may have evolved. <input type="checkbox"/> Compare and contrast bacteria and viruses. 	
Resources	<i>Modern Biology(2002)</i> Reading: Chapter 25: Viruses	
Lecture Notes	▶ Virus Notes Massengale ▶ Viruses, Viroids and Prions ▶ The big picture book of viruses	
Labs/Activities	▶ Virus Puzzle	▶
Homework	25-1 Worksheet 25-2 Worksheet 25-3 Worksheet	Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets
Assessment	<input type="checkbox"/> Chapter 25 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Collins: Is It Alive? <input type="checkbox"/> Lab Report	<input type="checkbox"/> Lab Rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Fourth Quarter Topics:

1. Ecology
2. Human Anatomy & Physiology
3. MCAS Review

Topic	INTRODUCTION TO ECOLOGY: 1 WEEKS	
MA Standards	▶	
Concepts	Ecology is the interaction among organisms and between organisms and their environment.	
Essential Questions	▶ Explain the interconnectedness among all of the living organisms in an ecosystem.	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Define the term <i>ecology</i>, and explain why ecology is important. <input type="checkbox"/> Explain the theme of interconnectedness. <input type="checkbox"/> Contrast abiotic factors with biotic factors, and list two examples of each. <input type="checkbox"/> Describe some adaptations that allow organisms to avoid unfavorable conditions. <input type="checkbox"/> Explain the concept of the niche. 	
Resources	Modern Biology(2002) Reading: Chapter 19: Introduction to Ecology Chapter 23-1: Biodiversity	
Lecture Notes	Ecology Notes MB Ecology PPT Chapters 19-22	
Labs/Activities	Carrying Capacity Activity Ecology Puzzle	▶ MB Labs C24,C25
Homework	Study Guide Worksheets 19-1 Worksheet 19-2 Worksheet	Sections Reviews Vocabulary Chapter Review Questions
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Chapter 19 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports 	<ul style="list-style-type: none"> <input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Topic	ECOLOGY OF POPULATIONS: 1 WEEK	
MA Standards	6.1 POPULATION ECOLOGY ▶ Explain how birth, death, immigration, and emigration influence population size 6.2 Analyze changes in population size and biodiversity (speciation and extinction) that result from the following: natural causes, changes in climate, human activity, and the introduction of invasive, non-native species.	
Concepts	Ecology is the interaction among organisms and between organisms and their environment.	
Essential Questions	▶ Explain why genetic diversity is important to the survival of populations.	
Performance Objectives	Students will be able to: 1. Explain the difference between population size, density, and dispersion. 2. Identify carrying capacity on a graph. 3. List three reasons why small populations are more vulnerable to extinction. 4. Explain how: <ul style="list-style-type: none"> • Natural causes • Changes in climate • Human activity • Invasive and non-native species affect population size and biodiversity. 	
Resources	Modern Biology(2002) Reading: Chapter 20: Population Ecology	
Lecture Notes	Chapter 20 PPT Ecology notes-JJohnson	
Labs/Activities	▶ Predation activity ▶ MB Lab A13 ▶ Lesson of the Kaibib	
Homework	▶ Sections Reviews ▶ Vocabulary ▶ Chapter Review Questions	Study Guide Worksheets 20-1 Worksheet 20-2 Worksheet
Assessment	<input type="checkbox"/> Collins <input type="checkbox"/> Chapter 20 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports	<input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubric



Topic	ECOLOGY OF COMMUNITIES: 1 WEEK	
MA Standards	6.3 ECOLOGY OF COMMUNITIES ▶ Describe how relationships among organisms (predation, parasitism, competition, commensalism, and mutualism) add to the complexity of biological communities.	
Concepts	▶ Ecology is the interaction among organisms and between organisms and their environment.	
Essential Questions	▶ Explain how the relationships in a community contribute to the connectedness of the community.	
Performance Objectives	Students will be able to: <ul style="list-style-type: none"> <input type="checkbox"/> Distinguish between the 5 types of symbiosis and provide examples of organisms for each type of symbiosis. <input type="checkbox"/> Evaluate the importance of mimicry as a defense mechanism. <input type="checkbox"/> Describe two ways plants defend themselves against herbivores. <input type="checkbox"/> Explain how competition can affect community <i>structure including competition due to invasive and nonnative species</i>. <input type="checkbox"/> Contrast mutualism with commensalism, and give one example of each type of relationship. <input type="checkbox"/> Describe how species richness varies with the latitude, and explain a hypothesis for this pattern. <input type="checkbox"/> Distinguish between primary and secondary succession. <input type="checkbox"/> Identify some of the characteristics of pioneer species. <input type="checkbox"/> Explain how diversity is important to the stability of an ecosystem 	
Resources	<i>Modern Biology(2002)</i> Reading: Chapter 21: Community Ecology	
Lecture Notes	Chapter 21 PPT	
Labs/Activities	▶ Predation activity ▶ MB Lab A13	▶
Homework	Sections Reviews Vocabulary Chapter Review Questions	Study Guide Worksheets 20-1 Worksheet 20-2 Worksheet
Assessment	<input type="checkbox"/> Collins <input type="checkbox"/> Chapter 20 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports	<input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubri



Topic	TROPIC LEVELS & BIOGEOCHEMICAL CYCLES: 1 WEEK	
MA Standards	<ul style="list-style-type: none"> ▶ 6.3 TROPIC LEVELS ▶ Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels. ▶ 6.4 WATER, CARBON AND NITROGEN CYCLES ▶ Explain how water, carbon, and nitrogen cycle between abiotic resources and organic matter in an ecosystem and how oxygen cycles through photosynthesis and respiration. 	
Concepts	<ul style="list-style-type: none"> ▶ Ecology is the interaction among organisms and between organisms and their environment. 	
Essential Questions	<ul style="list-style-type: none"> ▶ How does energy flow through an ecosystem? How much is lost at each level? ▶ Explain how abiotic factors affect the biotic factors in an ecosystem. 	
Performance Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Explain the important role of producers, consumers, decomposers and detritivores in an ecosystem. <input type="checkbox"/> Contrast a food web with a food chain. <input type="checkbox"/> Explain why ecosystems usually contain only a few trophic levels. <input type="checkbox"/> Describe the steps of the water, nitrogen carbon, and oxygen cycles. <input type="checkbox"/> *Describe the major characteristics of each biome and include the following: <ul style="list-style-type: none"> ○ Climate ○ Vegetation ○ Adaptations ○ Living organisms 	
Resources	<p><i>Modern Biology(2002)</i> Reading: Chapter 22: Ecosystem and Biosphere</p>	
Lecture Notes	<p>Ecology Notes Masengale MB Ecology PPT Chapters 19-22 Ecology Project Summary</p>	
Labs/Activities	MB Labs A12,B10	▶
Homework	<p>Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets</p>	
Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> Collins <input type="checkbox"/> Chapter 20 Test <input type="checkbox"/> Exam Pro Test Questions <input type="checkbox"/> Lab reports 	<ul style="list-style-type: none"> <input type="checkbox"/> Lab rubric <input type="checkbox"/> Homework Rubric <input type="checkbox"/> School Wide Rubri



ANATOMY AND PHYSIOLOGY MA STANDARDS

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES
<p>4. Anatomy and Physiology <i>Broad Concept:</i> There is a relationship between the organization of cells into tissues, and tissues into organs. The structure and function of organs determine their relationships within body systems of an organism. Homeostasis allows the body to perform its normal functions.</p> <p style="text-align: center;">STANDARDS 4.1-4.8</p> <ul style="list-style-type: none"> • SEE NEXT PAGE FOR STANDARDS EXPLANATION 	<p>Students will be able to:</p> <p>1.</p> <p>identify and describe the major structures and functions of the following body systems:</p> <ul style="list-style-type: none"> • Digestive • Circulatory • Excretory • Respiratory • Nervous • Muscular/skeletal • Reproductive • Immune • Endocrine <p>1. Explain how the organ systems work together in maintaining homeostasis, including the role of feedback loops.</p>	<p><i>Modern Biology (1993)</i></p> <p>Reading: Chapter 42-47 Use as supplemental reading</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Body System Notes BioEd Body Systems PPT</p> <p>Labs/Activities Human Body Webquest Body System Brochure</p> <p>Videos: National Geographic Human Machine; Body Systems</p> <p>Homework: Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets</p>

4.1 Explain generally how the digestive system (mouth, pharynx, esophagus, stomach, small and large intestines, rectum) converts macromolecules from food into smaller molecules that can be used by cells for energy and for repair and growth.

4.2 Explain how the circulatory system (heart, arteries, veins, capillaries, red blood cells) transports nutrients and oxygen to cells and removes cell wastes. Describe how the kidneys and the liver are closely associated with the circulatory system as they perform the excretory function of removing waste from the blood. Recognize that kidneys remove nitrogenous wastes, and the liver removes many toxic compounds from blood.

4.3 Explain how the respiratory system (nose, pharynx, larynx, trachea, lungs, alveoli) provides exchange of oxygen and carbon dioxide.

4.4 Explain how the nervous system (brain, spinal cord, sensory neurons, motor neurons) mediates communication between different parts of the body and the body's interactions with the environment. Identify the basic unit of the nervous system, the neuron, and explain generally how it works.

4.5 Explain how the muscular/skeletal system (skeletal, smooth and cardiac muscle, bones, cartilage, ligaments, tendons) works with other systems to support and allow for movement. Recognize that bones produce both red and white blood cells.

4.6 Recognize that the sexual reproductive system allows organisms to produce offspring that receive half of their genetic information from their mother and half from their father and that sexually produced offspring resemble, but are not identical to, either of their parents.

4.7 Recognize that communication between cells is required for coordination of body functions. The nerves communicate with electrochemical signals, hormones circulate through the blood, and some cells produce signals to communicate only with nearby cells.

4.8 Recognize that the body's systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.