

LYNN ENGLISH HIGH SCHOOL SCIENCE DEPARTMENT



LYNN PUBLIC SCHOOLS

10TH GRADE BIOLOGY CURRICULUM

ACCORDING TO MASSACHUSETTS STANDARDS

CORRESPONDS TO THE TEXTBOOK – MODERN BIOLOGY 2002

SCHOOL YEAR 2009-2010

ORGANIC MOLECULES

CELL STRUCTURE AND FUNCTION

CELL TRANSPORT

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CELL RESPIRATION

CELL REPRODUCTION

MEDELIAN GENETICS

GENETICS –DNA, RNA AND PROTEIN SYNTHESIS

GENETICS-INHERITANCE PATTERNS

POPULATION GENETICS

ANATOMY AND PHYSIOLOGY

ORGANIC MOLECULES

STANDARDS/TOPIC	LEARNING OBJECTIVES (adapted from <i>Modern Biology</i> 2002)	RESOURCES	ASSESSMENT
<p>1. The Chemistry of Life</p> <p style="text-align: center;">1.2 ORGANIC MOLECULES</p> <ul style="list-style-type: none"> • 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 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Describe the structure of a water molecule. 2. Explain how water's polar nature affects its ability to dissolve substances. 3. List <i>properties of water</i> that result from hydrogen bonding. 4. Define <i>organic compounds</i> and name six elements often found in organic compounds. 5. Explain why carbon forms so many different compounds. 6. Define <i>functional group</i> and explain its significance. 7. Define reaction and identify the reactants and products in a chemical equation. 8. Compare a condensation reaction with hydrolysis. 9. List 4 major types of organic molecules and give specific examples of each. 10. Describe the basic molecular structure and function of: <ul style="list-style-type: none"> • carbohydrates • lipids • proteins • nucleic acids 	<p><i>Modern Biology</i> (2002)</p> <p>Reading: Chapter 3: Biochemistry</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Chapter 3 Notes/Johnson Carbon Compounds PPT Carbohydrates PPT Proteins PPT Lipids PPT Nucleic Acids PPT</p> <p>Labs/Activities: Organic Molecules Concept Map Food Chemistry Lab CHONPS Activity Constructing Organic Molecules Collins Brainstorm More Biochemistry Activities</p> <p>Homework: Section Reviews: 1-2 Chapter Review Questions 3-1 Worksheet 3-2 Worksheet 3-3 Worksheet</p>	<p>Collins: Organic Molecules</p> <p>Chapter 4 Test</p> <p>Exam Pro Test Questions with Essays & Problems</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

CELL STRUCTURE AND FUNCTION

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>2. Cell Biology <i>Broad Concept:</i> Cells have specific structures and functions that make them distinctive. Processes in a cell can be classified broadly as growth, maintenance, and reproduction</p> <p style="text-align: center;">2.1 CELL STRUCTURE AND FUNCTION</p> <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). <p style="text-align: center;">2.2 PROKARYOTES/EUKARYOTES</p> <ul style="list-style-type: none"> ▪ Compare and contrast, at the cellular level, prokaryotes and eukaryotes (general structures and degrees of complexity). 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. State the cell theory. 2. Identify a limiting factor on the size of cells. 3. Describe the relationship between cell shape and cell function. 4. Distinguish between prokaryotes and eukaryotes. 5. Describe the structure, composition, and function of the cell membrane. 6. Name the major organelles found in a eukaryotic cell, and describe their structure functions. 7. Describe relationships between organelles necessary to carry out cellular processes. 8. Describe the structure and function of the nucleus. 9. Explain how chloroplasts and mitochondria are related. 10. Describe additional three structures characteristic of plant cells. 11. Explain the relationship between photosynthesis and aerobic respiration. 12. Distinguish between tissues, organs, and organ systems. 13. Describe the features of a colonial organism 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 4: Structure and Function of the Cell</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Chapter 4: The Cell Notes Cell Overview PPT Tour of The Cell PPT Cells Alive WEBSITE Cell Organelles PPT Amazing Cell Video</p> <p>Labs/Activities Cell Web Quest GO Cell Analogy Project Cell Analogy Collage Cell History Webquest Lab: Comparing Cells</p> <p>Homework:</p> <ul style="list-style-type: none"> • Sections Review 4-1-2 • Study Guide Worksheets • 4-1 Worksheet • 4-2 Worksheet • Build a Cell Worksheet • Chapter Review Questions 	<p>Collins: Comparing and Contrasting Prokaryotic and Eukaryotic Cells</p> <p>Collins: Comparing and Contrasting Plant and Animal Cells</p> <p>Collins: Compare and Contrast 2 cell organelles</p> <p>Chapter 5 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

CELL TRANSPORT

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>Chapter 7 Cell Biology</p> <p style="text-align: center;">2.1</p> <p style="text-align: center;">CELL TRANSPORT</p> <p>▪ Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, facilitated diffusion, and active transport).</p>	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Distinguish between passive and active transport. 2. List types of active and passive transport with examples. 3. Explain how equilibrium is established as a result of diffusion. 4. Distinguish between diffusion and osmosis. 5. Explain how substances cross the cell membrane through facilitated diffusion. 6. Explain how ion channels assist the diffusion of ions across the cell membrane. 7. Describe the sodium-potassium pump. 8. Compare and contrast endocytosis and exocytosis. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 5: Homeostasis and Transport</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Homeostasis and Cell Transport Notes BiologyZone Homeostasis and Transport PPT Cell Transport Power Point</p> <p>Labs/Activities Lab: Diffusion and Osmosis</p> <p>Homework:</p> <ul style="list-style-type: none"> • Sections Review 5-1-2 • 5.1 Worksheet • 5.2 Worksheet • Transport Graphic Organizer • Chapter Review Questions 	<p>Collins: Diffusion and Osmosis Lab Report</p> <p>Chapter 6 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

PHOTOSYNTHESIS

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>Chapter 7 Cell Biology</p> <p style="text-align: center;">2.4</p> <p style="text-align: center;">PHOTOSYNTHESIS</p> <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. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Explain the purpose of photosynthesis. 2. Identify the reactants and products of photosynthesis. 3. Explain the role of the chloroplast in photosynthesis. 4. Describe the role of chlorophylls and other pigments in photosynthesis. 5. Explain how energy flows through the photosynthetic process and sequentially identify reactants and products in various stages of reactions. 6. Describe what happens to a water molecule in photosynthesis. 7. Summarize adaptations of C₃, C₄, and CAM plants. 8. Explain how environmental factors influence photosynthesis. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 6: Photosynthesis</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: MB Structure of Chloroplasts ppt Photosynthesis notes from Web BiologyZone Photosynthesis Powerpoint Photosynthesis Overview Photosynthesis Worksheet</p> <p>Labs/Activities Photosynthesis and Cell Respiration Review Lab: MB Chromatography Photosynthesis Colorings Photosynthesis Cards</p> <p>Homework:</p> <ul style="list-style-type: none"> • Sections Reviews 6-1-2 • 6-1 Worksheet • 6-2 Worksheet • Chapter Review Questions 	<p>Chapter 7 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Performance Assessment: Photo Cards</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

CELL RESPIRATION

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>Chapter 7 Cell Biology</p> <p style="text-align: center;">2.4</p> <p style="text-align: center;">CELL RESPIRATION</p> <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. <p style="text-align: center;">2.5</p> <ul style="list-style-type: none"> • Explain the important role that ATP serves in metabolism 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Explain the purpose of <i>cellular respiration</i> 2. List the reactants and products of cellular respiration. 3. Describe the structure of ATP and it's role in energy transfer. 4. Describe the major events in glycolysis and where it occurs. 5. Distinguish between aerobic and anaerobic respiration. 6. List steps and amount of ATP produced in aerobic respiration. 7. List steps and amount of ATP produced in anaerobic respiration. 8. Compare and contrast lactic acid fermentation and alcoholic fermentation 9. Identify the role of mitochondria in aerobic respiration. 10. Explain endosymbiotic theory of evolution in relation to the development of multiple pathways for respiration. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 7: Cell Respiration</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Cell Respiration Notes from Web BiologyZone Cell Respiration PPT PH Cell Respiration Concepts Cell Respiration Worksheet</p> <p>Labs/Activities</p> <p>Homework:</p> <ul style="list-style-type: none"> • Sections Reviews -7-1-2 • 7-1 Worksheet • 7-2 Worksheet • Chapter Review Questions 	<p>Chapter 7 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Performance Assessment: Photo Cards</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

CELL REPRODUCTION

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>2. Cell Biology</p> <p style="text-align: center;">2.6 MITOSIS</p> <ul style="list-style-type: none"> 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. <p style="text-align: center;">2.7 MEIOSIS</p> <ul style="list-style-type: none"> Describe how the process of meiosis results in the formation of haploid cells. Explain the importance of this process in sexual reproduction, and how gametes form diploid zygotes in the process of fertilization. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> Describe each phase of the cell cycle Describe the structure of a chromosome. Compare prokaryotic chromosomes with eukaryotic chromosomes. Explain the differences between sex chromosomes and autosomes. Give examples of diploid and haploid cells. Describe the events of binary fission. Describe the purpose of mitosis and identify cells that undergo mitosis. Summarize the phases of mitosis. Compare cytokinesis in animal cells with cytokinesis in plant cells. Describe the purpose of meiosis and identify cells that undergo meiosis. List and describe the phases of meiosis. Compare the end products of mitosis with those of meiosis. Explain crossing-over and how it contributes to the production of unique individuals. Compare and contrast the results of spermatogenesis and oogenesis. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 8: Cell Reproduction</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Cell Cycle PPT Cell Division Notes-Massengale Cell Growth and Division PPT Animal Cell Mitosis Plant Cell Mitosis</p> <p>Labs/Activities Mitosis/Meiosis Posters Lab: Mitosis string Mitosis/Meiosis Flipbooks Lab B5: Mitosis Computer Lab: Mitosis and Meiosis in Motion</p> <p>Homework:</p> <ul style="list-style-type: none"> Sections Reviews 8-1-2 8-1 Worksheet 8-2 Worksheet 8-3 Worksheet Chapter Review Questions 	<p>Collins: The Cell Cycle</p> <p>Chapter 9 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

GENETICS-MENDEL

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>3. Genetics</p> <p style="text-align: center;">3.5 MENDEL'S LAWS</p> <ul style="list-style-type: none"> Describe how Mendel's laws of segregation and independent assortment can be observed through patterns of inheritance (such as dihybrid crosses). <p style="text-align: center;">3.6 PUNNETT SQUARES</p> <ul style="list-style-type: none"> Use a Punnett Square to determine the probabilities for genotype and phenotype combinations in monohybrid crosses. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> Describe the steps involved in Mendel's experiments on garden peas. Define, differentiate and give examples of the following terms: <ul style="list-style-type: none"> Allele/gene Incomplete dominance/codominance Heterozygous/homozygous Phenotype/genotype Distinguish between dominant and recessive traits. State the laws of heredity that were developed from Mendel's work. Describe how Mendel's results can be explained by scientific knowledge of genes and chromosomes. Explain how probability is used to predict the results of genetic crosses. Use a Punnett square to predict the results of monohybrid and dihybrid genetic crosses. Explain how a testcross is used to show the genotype of an individual whose phenotype is dominant. Explain how Mendel's laws can be demonstrated with punnett squares. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 9: Fundamentals of Genetics</p> <p>Warm-ups: ELL: Active Reading KWL Review Questions</p> <p>Lecture Notes: <u>Genetics Notes (Massengale)</u> <u>Mendel's Genetics PPT</u></p> <p>Labs/Activities <u>Lab: Genetic Traits</u> MB Labs C12, 13,14; E5 <u>Modeling Genetics: Paper Pets</u> Quick Lab p.173 (2002)</p> <p>Homework: Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets <u>9-1 Worksheet</u> <u>9-2 Worksheet</u></p>	<p>Collins</p> <p>Chapter Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p><u>Lab rubric</u></p> <p><u>Homework Rubric</u></p> <p><u>School Wide Rubric</u></p>

GENETICS-DNA, RNA AND PROTEIN SYNTHESIS

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>3. Genetics <i>Broad Concept:</i> 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.</p> <p style="text-align: center;">3.1 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 style="text-align: center;">3.2 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. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> Explain the principal function of DNA. Describe the structure of DNA: <ul style="list-style-type: none"> double helix sugar/phosphate backbone complementary nucleotide pairs Explain the role of complementary base pairing in the replication of DNA. Explain the main process of DNA replication. Explain the primary function of RNA. Compare the structure of RNA with that of DNA. Describe the structure and function of each type of RNA. Explain the process of transcription. Describe the genetic code. Distinguish between a codon and an anticodon, and state where each is found. Explain the roles of the start codon and stop codon. Explain the process of translation. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 10: Nucleic Acids and Protein Synthesis</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: <u>Notes: DNA, RNA & Protein Synthesis</u> <u>Amazing Cell Video</u> <u>Nucleic Acids PPT</u></p> <p>Labs/Activities Lab: Protein Synthesis Kit <u>Protein Synthesis Activity</u> <u>Modeling Replication</u> <u>10-1 Directed Reading Worksheet</u> <u>10-2 and 10-3 Directed Reading Worksheet</u></p> <p>Homework: Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets <u>10-1 Worksheet</u> <u>10-2 Worksheet</u> <u>10-3 Worksheet</u></p>	<p>Collins: Compare and Contrast DNA and RNA</p> <p>Chapter 8 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p><u>Lab rubric</u></p> <p><u>Homework Rubric</u></p> <p><u>School Wide Rubric</u></p>

GENETICS-INHERITANCE PATTERNS

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>3. Genetics</p> <p style="text-align: center;">3.3</p> <p style="text-align: center;">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 style="text-align: center;">3.4</p> <p style="text-align: center;">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). 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Explain the role of sex chromosomes in sex determination. 2. Describe how sex linkage affects the inheritance of traits. 3. Explain the effect of crossing-over on the inheritance of genes in linkage groups. 4. Distinguish between chromosome mutations and gene mutations. 5. Define <i>pedigree</i> 6. Show how pedigree analysis can be used to illustrate the inheritance of traits. 7. Explain the inheritance of ABO blood groups. 8. Give examples of traits or disorders transmitted by autosomal dominant, autosomal recessive, polygenic and X-linked recessive inheritance. 9. Compare sex-linked traits with sex-influenced traits. 10. Explain how nondisjunction can cause human genetic disorders. 	<p><i>Modern Biology (2002)</i></p> <p>Reading: Chapter 12: Inheritance Patterns and Human Genetics</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Gene Mutation Notes(Masengale)</p> <p>Labs/Activities MB Lab C15 Genetic Disorder Brochure Project Genetics Brochure Storyboard</p> <p>Homework: Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets 12.1 Worksheet 12.2 Worksheet</p>	<p>Chapter 12 Test Quiz: Sex-linked traits Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

POPULATION GENETICS

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<p>5. Evolution and Biodiversity</p> <p style="text-align: center;">5.2 POPULATIONS AND SPECIATION</p> <ul style="list-style-type: none"> • Describe species as reproductively distinct groups of organisms. • Describe the role that geographic isolation can play in speciation. <p style="text-align: center;">5.3 NATURAL SELECTION</p> <ul style="list-style-type: none"> • Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity from a population. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Define <i>population genetics, gene pool, and allele frequency.</i> 2. Explain what causes variations in populations. 3. List conditions of genetic equilibrium 4. Explain conditions that can cause evolution to take place: <ul style="list-style-type: none"> • mutation • migration • genetic drift • nonrandom mating • natural selection 5. Contrast the effects of stabilizing, directional, and disruptive selection on variations in a trait over time. 6. Give an example of sexual selection. 7. Explain the difference between the morphological concept of species and the biological species concept. 8. Explain how <i>geographic and reproductive isolation</i> can lead to speciation. 9. Summarize the punctuated equilibrium hypothesis, and contrast it with the hypothesis of gradual change. 	<p><i>Modern Biology (1993)</i></p> <p>Reading: Chapter 16: Evolution of Populations and Speciation</p> <p>Warm-ups: Active Reading KWL Review Questions</p> <p>Lecture Notes: Population Genetics Notes Populations Evolution PPT</p> <p>Labs/Activities Quick Lab p. 306 MB Lab B9 Population Genetics Goldfish</p> <p>Homework: Sections Reviews Vocabulary Chapter Review Questions Study Guide Worksheets 16-1 Worksheet 16-2 Worksheet 16-3 Worksheet</p>	<p>Collins: Causes of Variation in Populations</p> <p>Chapter 16 Test</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

ANATOMY AND PHYSIOLOGY

STANDARDS/TOPIC	LEARNING OBJECTIVES	RESOURCES	ASSESSMENT
<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>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> <ol style="list-style-type: none">1. Identify and describe the major structures and functions of the following body systems:<ul style="list-style-type: none">• Digestive• Circulatory• Excretory• Respiratory• Nervous• Muscular/skeletal• Reproductive• Immune• Endocrine2. Explain how the organ systems work together in maintaining homeostasis, including the role of feedback loops.	<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>	<p>Chapter Test</p> <p>Travel Brochure Rubric</p> <p>Exam Pro Test Questions</p> <p>Lab reports</p> <p>Lab rubric</p> <p>Homework Rubric</p> <p>School Wide Rubric</p>

BIOLOGY I CURRICULUM: ANATOMY AND PHYSIOLOGY MA STANDARDS

- 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.