

Biology Level 2, 1b

**Unit:** Genetics

Essential Questions

1. What is the principle of dominance?
2. What happens during segregation?
3. How do geneticists use the principles of probability?
4. How do geneticists use a Punnett Square? (monohybrid and dihybrid crosses)
5. What are Mendel's two laws and why are they important?
6. What inheritance patterns exist aside from simple dominance?
7. How is sex determined?
8. How do small changes in DNA cause genetic disorders?
9. Why are sex-linked disorders more common in males than females?
10. What is non-disjunction and what problems does it cause?

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
3.4 Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, incomplete dominance, codominant, sex-linked, polygenic, and multiple alleles).  See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:  <b>RSL #</b> (reading standard for literacy: 2,3,4)  <b>WSL #</b> (Writing Standard for literacy: 2,3,4,5,9)	-Explain the difference between genotype and phenotype -Distinguish between a homozygous genotype and a heterozygous genotype -Compare complete dominance with codominance -Give examples of sex-linked traits and compare sex-linked inheritance with sex-influenced -Distinguish between multiple alleles and multiple genes -Describe several genetic disorders in humans and their patterns of transmission -Explain what a genetic counselor does	Genetics PowerPoint Guided Notes Genetics Vocabulary fill in worksheet  Mendel's Work worksheet  Solving Genetics Problems Guided sheet  What Color is the Pod worksheet  Genetics Practice Problems – Simple Worksheet  Punnett Square worksheet  Pea Plant Punnett Square	Genetics and Heredity PowerPoint  Class notes  Lecture/ discussion  Practice Problems on board  Think pair Share (including answers on board)  Drawing Diagrams  Ticket to leave  Dip sticking	Genetics Monohybrid Quiz  Baby Face Lab  Dominant/ Recessive Traits lab (Freaky Human Traits)  Mendelian Genetics Monohybrid Cross Quiz  Chapter 7 Section 1-3 Assessments questions 1-4 and section summaries  Completion and Understanding checks on all listed worksheets in Recourses section of this document

		<p>worksheet</p> <p>Practice Punnett Squares</p> <p>Bikini Bottom Genetics (1 &amp; 2) worksheet</p> <p>Dominant/ Recessive Traits lab (Freaky Human Traits).          PTC paper          Sodium Benzoate paper          Thiourea paper</p> <p>Genetics problems worksheet</p> <p>Baby face Lab</p> <p>Genetics Power Point Guided Notes 2</p> <p>How do I Perform a dihybrid Cross? Worksheet</p> <p>Dihybrid cross worksheet</p> <p>Genetics crosses that involve 2 traits – biology 2A worksheet</p> <p>Genetics Power Point Guided Notes 3</p> <p>Practice Co-dominance &amp; Incomplete Dominance worksheets</p> <p>What are Incomplete &amp; Co-Dominance? worksheets</p>	<p>Graphic organizer</p> <p>Class notes</p> <p>Lecture/ discussion</p> <p>Practice Problems on board</p> <p>Think pair Share (including answers on board)</p> <p>Mini white board practice</p>	
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<p>3.5 Describe how Mendel’s laws of segregation and independent assortment can be observed through patterns of inheritance (such as dihybrid crosses).</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 2,4,7</p>	<p>-State and give examples for each of Mendel’s principles</p> <p>-Discuss the effect of linkage on independent assortment</p> <p>-Describe how crossing over affects linkage</p>	<p>Dihybrid genetics problems including:</p> <p>Genetics Power Point Guided Notes 2</p> <p>How do I Perform a dihybrid Cross? Worksheet</p> <p>Dihybrid cross worksheet</p> <p>Genetics crosses that involve 2 traits – biology 2A worksheet</p>	<p>Graphic Organizer</p>	<p>Genetics Test term 1</p> <p>Chapter 7 Section 1-3 Assessments questions 1-4 and section summaries</p>

<p><b>WSL #</b> (Writing Standard for literacy:</p>				
<p>3.6 Use a Punnett Square to determine the probabilities for genotype and phenotype combinations in monohybrid crosses.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 2,3,4,7,10</p> <p><b>WSL #</b> (Writing Standard for literacy: 2,3,4,5,6</p>	<p>-Construct and interpret Punnett squares for monohybrid, dihybrid crosses, and test crosses</p>	<p>Practice Mendel's genetics problems (monohybrid)</p> <p>Baby face Lab</p> <p>Dominant/ Recessive Traits lab (Freaky Human Traits).          PTC paper          Sodium Benzoate paper          Thiourea paper</p> <p>Bikini Bottom Genetics (1 &amp; 2)</p>	<p>Graphic Organizer</p> <p>Class notes</p> <p>Lecture/ discussion</p> <p>Practice Problems on board</p> <p>Think pair Share (including answers on board)</p> <p>Dip sticking with Mini white boards</p>	<p>Genetics Test term 1</p> <p>Chapter 7 Section 1-3 Assessments questions 1-4 and section summaries</p>

**Unit: Anatomy and Physiology**  
 Essential Questions

How is the body organized?  
 What is homeostasis?

What are the structures and function of the kidneys?  
 How is blood filtered?  
 What is dialysis?

What are the structures and function of the circulatory system?  
 What are the three types of blood vessels in the circulatory system?  
 What are the functions of each of the blood cells and where are they produced?  
 What is lymph in the lymphatic system?  
 What are disease/ disorders of the circulatory system?

What are the structures and function of the respiratory system?  
 How does smoking affect the respiratory system?  
 What are disease/ disorders of the respiratory system?

What are the structures and function of the Nervous system?  
 How is a nerve impulse transmitted?  
 What are the functions of the central nervous system?  
 What are the functions of the two divisions of the peripheral nervous system?  
 What are the five types of sensory receptors?  
 What are disease/ disorders of the nervous system?

What are the structures and function of the muscular and skeletal system?  
 What are the structures of a typical bone?  
 What are the three different kinds of joints?  
 What are the three types of muscle tissue?  
 How do muscles contract?  
 Why is exercise important?

How are eggs and sperm produced?  
 What is the endocrine system?  
 What's the role of hormones in homeostasis?  
 What the difference between a positive and a negative feedback loop?

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
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	-Identify the anatomical features of the human heart -Describe how the rate of the heart beat is controlled -List some causes of heart attacks -Trace the path of a single blood cell in a complete circuit through the	Your Heart and Circulatory System reading packet which includes: <ul style="list-style-type: none"> <li>• Circulatory system diagrams</li> <li>• Circulatory system coloring sheet</li> <li>• Heart fill in the blank worksheets</li> <li>• Three types of blood vessels reading and worksheet</li> <li>• Blood composition worksheet</li> <li>• Circulatory system crossword</li> <li>• Circulatory system true false questions</li> </ul>	Think pair share Flow charts Draw picture diagram Graphic organizer Assess heart rate in	Chapter 32 section 1 - 2 questions 1-4 and section summaries Chapter 34 section questions 1-4 and section summary Circulatory and excretory System Test

<p>associated with the circulatory system as they perform the excretory function of removing wastes from the blood. Recognize that kidneys remove nitrogenous wastes, and the liver removes many toxic compounds from blood.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2,3,5,7</p> <p><b>WSL #</b> (Writing Standard for literacy: 4,5,6,7,8,9,10</p>	<p>circulatory system</p> <p>-Compare and contrast the structure and function of the three kinds of blood vessels</p> <p>-Explain the significance of blood pressure</p> <p>-Identify several functions of blood plasma</p> <p>-Contrast the structure and function of white and red blood cells</p> <p>-Give examples of how the liver maintains homeostasis</p> <p>-Describe the location and function of the kidneys</p>	<ul style="list-style-type: none"> <li>• Heart Rate and Exercise Lab Vernier heart rate monitors</li> </ul> <p>Lesson 44:P Circulatory and Respiratory system packet</p> <p>Bill Nye circulatory movie with worksheet</p> <p>Inside Look at Heart Attack Discovery movie <a href="http://www.youtube.com/watch?v=MyZ1-haX_ZE">http://www.youtube.com/watch?v=MyZ1-haX_ZE</a></p> <p>Your Kidneys reading packet which includes:</p> <ul style="list-style-type: none"> <li>• Heart fill in the blank worksheets</li> <li>• Excretory system diagrams</li> <li>• Excretory system coloring sheet</li> <li>• Structure of the nephron fill in diagram</li> <li>• The excretory system post quiz</li> <li>• Vocabulary review sheet</li> <li>• Waste removal worksheet</li> </ul> <p>Lesson 45 Digestion and Excretory system worksheet</p> <p>Youtube excretory system clips: <a href="http://www.youtube.com/watch?v=qxb2_d9ilEw">http://www.youtube.com/watch?v=qxb2_d9ilEw</a> <a href="http://www.youtube.com/watch?v=aQZaNXNroVY&amp;feature=related">http://www.youtube.com/watch?v=aQZaNXNroVY&amp;feature=related</a></p> <p>Standard Deviant Excretory System movie</p>	<p>response to varying activity</p>	<p>Packet completion for both systems</p>
<p>4.3 Explain how the respiratory system (nose, pharynx, larynx, trachea, lungs, alveoli) provides exchange of oxygen and carbon dioxide.</p>	<p>-Identify the structures of the human respiratory system and state the function</p> <p>-Trace the path of oxygen and carbon dioxide throughout the body</p> <p>-Describe how air enters</p>	<p>Your Lungs and Respiratory System reading packet which includes:</p> <ul style="list-style-type: none"> <li>• respiratory system diagrams</li> <li>• respiratory system coloring sheet</li> <li>• Lung Capacity Lab</li> <li>• The amazing journey of captain Oxygen storyboard</li> </ul> <p>Quiz Review Study guide – Respiratory System</p>	<p>Think pair share</p> <p>Flow charts</p> <p>Draw picture diagram</p> <p>Graphic organizer</p>	<p>Chapter 32 section 3 questions 1-4 and section summary</p> <p>WAC type 2 respiratory breathing process</p>

<p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2, 3,5,7,9</p> <p><b>WSL #</b> (Writing Standard for literacy: 4,5,9,10</p>	<p>and leaves the lungs</p>	<p>WAC type 2 respiratory breathing process</p> <p>Bill Nye Respiration with worksheet</p> <p>*Make Model of Lungs</p>	<p>Making models</p>	<p>Lung Capacity Lab</p> <p>Packet completion for both systems</p>
<p>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.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2,3,5,7</p>	<p>-Distinguish between different types of neurons          -Name the parts of a neuron          -Describe the role of the synapse          -Explain how a nerve impulse is transmitted          -Relate the role of neurotransmitters to muscle function          -Describe the structure and function of the cerebrum          -Explain why taste and smell are called "chemical senses"</p>	<p>Nervous System reading packet which includes:</p> <ul style="list-style-type: none"> <li>• Nervous system diagrams</li> <li>• Nervous system coloring sheet</li> <li>• Neuron Diagram</li> <li>• Impulse Transmitter Diagram</li> </ul> <p>Stimuli, senses and Time Response: Reaction rate Lab</p> <p>Skin Sensitivity Lab</p> <p>Movie: Neurons at Work</p>	<p>Think pair share</p> <p>Flow charts</p> <p>Draw picture diagram</p> <p>Graphic organizer</p>	<p>Chapter 35 test</p> <p>Chapter 30 sections 1-3 questions 1-4 and section summaries</p> <p>Reaction rate Lab</p> <p>Skin Sensitivity Lab</p> <p>Packet completion for both systems</p> <p>Nervous System Quiz</p>

<p><b>WSL #</b> (Writing Standard for literacy: 4,5,6,8</p>				
<p>4.4 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.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy:</p> <p><b>WSL #</b> (Writing Standard for literacy: 9</p>	<p>-Name the four basic types of tissue that make up the human body          -Describe the structure of striated muscle          -Explain the mechanism of contraction in skeletal muscle          -Compare and contrast smooth muscle, cardiac muscle, and striated muscle</p>	<p>Muscular System reading packet which includes:</p> <ul style="list-style-type: none"> <li>• Muscular system diagrams</li> <li>• Muscular system coloring sheet</li> <li>• Types of muscles worksheets</li> <li>• Working in pairs</li> <li>• Muscular action</li> </ul> <p>Your Bones reading packet which includes:</p> <ul style="list-style-type: none"> <li>• Skeletal system diagrams</li> <li>• Skeletal system coloring sheet</li> <li>• Joints worksheet</li> <li>• Structure of Bone worksheet</li> </ul> <p>Review of skeletal and muscular system foldable          Skeletal model/ bones</p> <p>Chapter 29: The Human Body: Directed Reading packet</p> <p>Muscles and Joints movie</p> <p>Bones and joints movie</p> <p>Skeleton movie</p>	<p>Draw picture diagram</p> <p>Graphic organizer</p> <p>Visualization with models</p> <p>Game: Pin the bone/ muscle name on the model</p>	<p>Chapter 29 section 3&amp; 4 questions 1-4 and section summaries</p> <p>Muscular/ skeletal systems quiz</p> <p>Packet completion for both systems</p>
<p>4.6 Recognize that the sexual reproductive system allows organisms to produce offspring that receive half of their genetic</p>	<p>-Compare the production of sperm and eggs</p>	<p>See meiosis</p>	<p>See meiosis</p>	<p>See meiosis</p>

<p>information from their mother and half from their father and that sexually produced offspring resemble, but are not identical to, either of their parents.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy:</p> <p><b>WSL #</b> (Writing Standard for literacy: 9</p>				
<p>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.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for</p>	<p>-Name several hormones and state their sources and functions</p>	<p>See Nervous System reading packet</p> <p>Your Endocrine System reading packet which includes:</p> <ul style="list-style-type: none"> <li>• Endocrine system diagrams</li> <li>• Producing Hormones</li> <li>• Feedback loop notes</li> </ul> <p>“Selected Actions of Hormones and Other Chemical Messengers” movie</p>	<p>Draw picture diagram</p> <p>Graphic organizer</p>	<p>Chapter 31 sections 1- 3 questions 1-4 and section summaries</p> <p>Quiz Endocrine System</p> <p>Packet completion for both systems</p>

<p>grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2,5)</p> <p><b>WSL #</b> (Writing Standard for literacy: 4,9)</p>				
<p>4.8 Recognize that the body’s systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2,4,5)</p> <p><b>WSL #</b> (Writing Standard for literacy: 9</p>	<p>-Define homeostasis          -Explain how negative feedback works</p>	<p>“Selected Actions of Hormones and Other Chemical Messengers” movie</p> <p>Definitions of negative and positive feedback loops in Your Endocrine System reading packet.</p>	<p>Draw picture diagram</p> <p>Graphic organizer</p>	<p>Chapter 31 sections 1 and section summaries</p> <p>Chapter 39 section 1 questions Control of the Endocrine system questions 2</p>

Essential Questions

1. Who is Charles Darwin and what is his contribution to science?
2. What patterns did Darwin observe amongst the Galapagos?
3. Who were Lamarck and Malthus and what were their contributions to science?
4. How is natural variation used in artificial selection?
5. How is natural selection related to species' fitness?
6. What evidence of evolution did Darwin present?
7. What are the major sources of heritable variation in a population?
8. How is evolution defined in genetic terms?
9. What is genetic drift?
10. What five conditions are needed to maintain genetic equilibrium?
11. What factors are involved in the formation of a new species?
12. What is the process of speciation in Darwin's finches?
13. What is the fossil record?

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
5.1 Explain how evolution is demonstrated by evidence from the fossil record, comparative anatomy, genetics, molecular biology, and examples of natural selection.  See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:  <b>RSL #</b> (reading standard for literacy: 6,9)  <b>WSL #</b> (Writing Standard for literacy:	-State how radioactive isotopes are used to date rocks and fossils -List and explain the supporting data for evolutionary theory - Compare and Contrast vertebrate body plan - Compare amino acid sequences between vertebrates - Connect genetics to evolution - Interpret data and draw conclusions about evolution using movies	Charles Darwin: Lesson 8, Active Reading  Evolution and Natural Selection worksheet  Evolution PowerPoint  Evidence for Evolution Guided Notes Packet  Evolution Series Movies with Movie Questions <ul style="list-style-type: none"> <li>• Darwin's Dangerous Idea Movie and Guided Movie Worksheet and Character List</li> <li>• Great Transformations Movie and Guided</li> </ul>	Graphic Organizer  Written Summary of Evidences of Evolution  Drawing/Coloring Diagrams  Interactive Investigation – Lab activity  One Question Quiz	Evolution Quiz  Chapter 10 sections 1- 3 questions 1-4 and section summaries  Evolution test

		<p>Movie Worksheet</p> <p>A Review of Biology: the Theory of Evolutions worksheet</p> <p>Amino Acid Sequences to Determine Evolutionary Relationships</p>		
<p>5.2 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. Describe the role that geographic isolation can play in speciation.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 4,5</p> <p><b>WSL #</b> (Writing Standard for literacy:</p>	<ul style="list-style-type: none"> <li>- Describe how organisms are grouped into species</li> <li>- Explain the role of isolation in the formation of new species</li> <li>- Distinguish between divergent evolution and convergent evolution</li> <li>- Explain how selection can stabilize a species</li> <li>- Distinguish between gradual evolution and punctuated equilibrium</li> <li>- Describe the characteristics of primates and state how each was originally and adaptation for life in trees</li> <li>- Define the term hominid</li> <li>- Identify the characteristics that distinguish between <i>Homo habilis</i>, <i>Homo erectus</i>, and <i>Homo sapien sapien</i>, and <i>Homo sapien neandertal</i></li> <li>- State several reasons why systems of classification are important</li> <li>- Explain several advantages of using a system of binomial nomenclature</li> <li>- List the levels of classification developed by Linnaeus</li> <li>- Describe a modern technique used to classify organisms</li> <li>- Describe how to create and use a dichotomous key</li> </ul>	<p>Six Kingdoms and Taxonomy PowerPoint</p> <p>Web quest: Taxonomy Comparison: Computer Lab Activity with Post test</p> <p>A review of Biology: Classification</p> <p>Candy and Creatures Dichotomous Keys</p>	<p>Graphic Organizer</p> <p>Drawing/Coloring Diagrams</p> <p>Interactive Investigation – Lab activity</p>	<p>Chapter 17 sections 1- 3 questions 1-4 and section summaries</p> <p>Taxonomy Comparison: Computer Lab Activity with Post test</p> <p>Classification/ Taxonomy test</p>

<p>5.3 Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity from a population.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 1,2,3,7,8,9)</p> <p><b>WSL #</b> (Writing Standard for literacy: 1,2,4,5,6,9)</p>	<p>- Describe how mutations influence genetic equilibrium</p> <p>-Describe how nonrandom mating and migration can affect allele frequencies</p> <p>-Discuss interactions between genes and the environment over many generations can cause changes in allele frequencies</p> <p>-Identify the role of variation and natural selection in Darwin’s theory of evolution</p>	<p>Fork &amp; Beans Natural Selection Lab</p> <p>“Populations Evolve, Individuals Don’t!” Guided Notes</p> <p>Evolution PowerPoint: The Process of Natural Selection slides</p> <p>Lamarck vs. Darwin dueling theories Comparison.</p>	<p>Graphic Organizer</p> <p>Interactive Investigation – Lab activity</p>	<p>Chapter 10 sections 3 questions 1-4 and section summaries</p> <p>Evolution Test</p>
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<p><b>Unit: Ecology</b></p> <p>Essential Questions</p> <ol style="list-style-type: none"> <li>1. What different levels of organization does an ecologist study?</li> <li>2. What methods are used to study ecology?</li> <li>3. Where does the energy for life processes come from?</li> <li>4. How does energy flow through living systems?</li> <li>5. How efficient is the transfer of energy among organisms in an ecosystem?</li> <li>6. How does matter move among the living and non-living parts of an ecosystem?</li> <li>7. How are nutrients important in living systems?</li> <li>8. What is the greenhouse effect?</li> <li>9. How does it maintain the biosphere’s temperature range?</li> <li>10. What are Earth’s three main climate zones?</li> <li>11. How do biotic and abiotic factors influence an ecosystem?</li> <li>12. What interactions occur within communities?</li> <li>13. What is ecological succession?</li> <li>14. What are unique characteristics of the world’s biomes?</li> <li>15. What are the major factors that govern aquatic ecosystems?</li> </ol>
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16. What are they two types of freshwater ecosystems?
17. What are the characteristics of different marine zones?
18. What characteristics are used to describe a population?
19. What factors affect population size?
20. What are exponential and logistic growths?
21. What factors limit population growth?
22. How has the size of the human population changed over time?
23. Why does population vary so much?
24. What type of human activities can affect the biosphere?

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
<p>6.1 Explain how birth, death, immigration, and emigration influence population size.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 3</p> <p><b>WSL #</b> (Writing Standard for literacy: 4,5</p>	<p>-Explain why populations do not reach their biotic potential</p> <p>-Discuss the relationship between growth rate and carrying capacity</p> <p>-List several factors that affect population size</p> <p>-Name several density-independent and density-dependent factors that limit population growth</p>	<p>Nature a Trickster: A Tale of Mice, Acorns and the Tick Season from Hell</p> <p>Oh, Deer! Activity</p>	<p>Game</p> <p>Graphing Activity</p>	<p>Ecology Unit Test</p>
<p>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.</p> <p>See last page for all <b>CCSS</b></p>	<p>-Contrast the growth rates of populations that have undergone demographic transition with those of populations that have not</p> <p>-Explain how human activities endanger natural resources</p>	<p>Cane Toad Movie and Article</p> <p>Evolution Series Movies with Movie Questions</p> <ul style="list-style-type: none"> <li>• Extinction</li> </ul>	<p>Lecture/ discussion of movies</p>	<p>Ecology Unit Test</p>

<p><b>reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 2</p> <p><b>WSL #</b> (Writing Standard for literacy:</p>				
<p>6.3 Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels. Describe how relationships among organisms (predation, parasitism, competition, commensalisms, and mutualism) add to the complexity of biological communities.</p> <p>See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:</p> <p><b>RSL #</b> (reading standard for literacy: 3,4,5,7</p> <p><b>WSL #</b> (Writing Standard for literacy: 4,5,9</p>	<ul style="list-style-type: none"> <li>-Describe the characteristics of an ecosystem</li> <li>-Identify the roles of organisms in an ecosystem</li> <li>-Diagram the feeding levels in food chains and food webs</li> <li>-Explain how a pyramid can be used to represent energy flow in a food web</li> <li>-Give examples of symbiosis</li> <li>-Explain how prey-predator relationship help to regulate population growth</li> </ul>	<p>Ecology PowerPoint</p> <p>Interactions Among organisms worksheet</p> <p>“What is a Food Pyramid? “          Activity – Vortek, Snive &amp; Kluge</p> <p>MCAS Open Response WAC: Food Webs</p> <p>MCAS Open Response WAC: Symbiotic Relationships</p> <p>Ecology: Organisms in their Environment PowerPoint with guided fill in notes</p> <p>Matter and Energy in Ecosystems notes and Food Chain Analysis</p> <p>Energy: Essential for Life’s Processes</p> <p>Food web coloring key</p> <p>Levels of Organization Notes worksheet</p>	<p>Lecture/ discussion notes</p> <p>Practice worksheets</p> <p>Drawings</p> <p>Dip sticking</p>	<p>Chapter 14 sections 1&amp; 3 questions 1-4 and section summaries</p> <p>Chapter 15 sections 1 questions 1-4 and section summary</p> <p>WAC food webs Essay</p> <p>WAC symbiosis Essay</p> <p>Ecology Test</p>

		Pictionary Ecology Game  Identifying abiotic and biotic factors and making food chains from the Evolution Series Movies with Movie Questions <ul style="list-style-type: none"> <li>Jungles</li> </ul> Ecology Quiz packet		
6.4 Explain how water, carbon, and nitrogen cycle between abiotic resources and organic matter in an ecosystem and how oxygen cycles through photosynthesis and respiration.  See last page for all <b>CCSS reading and writing standards</b> for grades 9-10:  <b>RSL #</b> (reading standard for literacy: 4  <b>WSL #</b> (Writing Standard for literacy: 9	-Describe how the supply of fresh water in the biosphere is maintained -Explain how carbon and oxygen are recycled between organisms and the atmosphere -Give examples of the forms of nitrogen produced during the nitrogen cycle	Cycles within the environment PowerPoint  Traveling Carbon Cycle Passport Game  Traveling Nitrogen Cycle Passport Game  Water Cycle Game, with pollutant option  Water cycle fill in the blank, cross word and word find  Ecosystems Recycle Chemicals worksheet  The carbon dioxide- oxygen cycle	Games  Drawings  Graphic organizers  Dip sticking	Chapter 14 sections 2 questions 1-4 and section summary  Cycles in the Ecosystem Test

**Unit: Scientific Inquiry Skills Standards**

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
SIS 1a Make	-Observe the world around them from a	Heart Rate and Exercise Lab	See 4.2	

observations, raise questions, and formulate hypotheses.	scientific perspective.			
SIS 1 b Make observations, raise questions, and formulate hypotheses.	-Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Heart Rate and Exercise Lab	See 4.2	
SIS 1 c Make observations, raise questions, and formulate hypotheses.	-Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories.	Lamarck vs. Darwin dueling theories Comparison.	See 5.3	
SIS 2 a Design and conduct scientific investigations.	-Articulate and explain the major concepts being investigated and the purpose of an investigation.	Lung Capacity Lab Heart Rate and Exercise Lab Baby Face Lab	See 4.3 See 4.2 See 3.6	
SIS 2b Design and conduct scientific investigations.	-Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Lung Capacity Lab Heart Rate and Exercise Lab Baby Face Lab	See 4.3 See 4.2 See 3.6	
SIS 2 c Design and conduct scientific investigations.	-Identify independent and dependent variables.	Heart rate and Exercise Lab	See 4.2	
SIS 2 d Design and conduct scientific investigations.	-Write procedures that are clear and replicable.	Heart Rate and Exercise Lab	See 4.2	
SIS 2 e Design and conduct scientific investigations.	-Employ appropriate methods for accurately and consistently -Making observations; -Making and recording measurements at an appropriate level of precision and; -Collecting data or evidence in an organized way.	Fork and Beans  Oh Deer activity	See 5.3  See 6.1	
SIS 2 f Design and	-Properly use instruments, equipment, and			

conduct scientific investigations.	materials (such as scales, probeware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage.	Reaction rate lab  Web quest: Taxonomy Comparison: Computer Lab Activity with Post test	See 4.4  See 5.2	
SIS 2 g Design and conduct scientific investigations.	-Follow safety guidelines	All Labs See Flinn Lab Safety Contract		
SIS 3 a Analyze and interpret results of scientific investigations	-Present relationships between variables in appropriate forms.	Heart Rate and exercise lab  Lung capacity lab	See 4.2  See 4.3	
SIS 3 b Analyze and interpret results of scientific investigations	-Use mathematical operations to analyze and interpret data results.	Fork and Beans	See 5.3	
SIS 3 c Analyze and interpret results of scientific investigations	-Identify reasons for inconsistent results, such as sources of error or uncontrolled conditions, and assess the reliability of data.	Heart Rate and exercise lab  Lung capacity lab	See 4.2  See 4.3	
SIS 3 d Analyze and interpret results of scientific investigations	-Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis.	Reaction rate lab Heart Rate and exercise lab	See 4.4 See 4.2	
SIS 3 e Analyze and interpret results of scientific investigations	-State questions raised by an experiment that may require further investigation.	Reaction rate lab Heart Rate and exercise lab Lung Capacity	See 4.4 See 4.2 See 4.3	

Framework Standard	Content/Skills	Resources	Instructional Strategies	Assessments
Use Mathematics as a tool in understanding, supporting, and defending scientific concepts.	<ul style="list-style-type: none"> <li>-Construct and use tables and graphs to interpret data sets</li> <li>-Solve simple algebraic expressions</li> <li>-Perform basic statistical procedures to analyze the center and spread of data</li> <li>-Measure with accuracy and precision</li> <li>-Convert within a unit</li> <li>-Use common prefixes</li> <li>-Use scientific notation, where appropriate</li> <li>-Use ratio and proportion in the solution of problems</li> <li>-Determine the correct number of significant figures</li> <li>-Determine the percent error from e</li> <li>-Determine the correct number of significant figures</li> <li>-Determine the percent error from experimental and accepted values</li> <li>-Use appropriate metric/standard international (SI) units of Measurement</li> <li>-Use Celsius the scale</li> </ul>	Reaction rate lab Lung Capacity Heart Rate and exercise lab Mendel Genetics Challenge Problems	See 4.4 See 4.3 See 4.2 See 3.4	

**End of term 4 Review of concepts covered in Biology 424. All review work will be assessed with MCAS practice questions packets and practice essays.**

## Reading Standards for Literacy in Science and Technical Subjects 6–12

[RST]

### Grades 6–8 students:

### Grades 9–10 students:

### Grades 11–12 students:

#### Key Ideas and Details

- |   |  |  |
|---|--|--|
| 1. Cite specific textual evidence to support analysis of science and technical texts.   | 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.  | 1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.        |
| 2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. | 2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.          | 2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.         |
| 3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.                | 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. | 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |

#### Craft and Structure

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|---|--|---|
| 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 6–8 texts and topics</i> . | 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 9–10 texts and topics</i> . | 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 11–12 texts and topics</i> . |
| 5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.  | 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., <i>force, friction, reaction force, energy</i> ).                                     | 5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.  |
| 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.   | 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.                               | 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.                              |

#### Integration of Knowledge and Ideas

- |  |   |  |
|--|---|--|
| 7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). | 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. | 7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| 8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.   | 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.  | 8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with                   |

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<b>9.</b> Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	<b>9.</b> Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.	<b>9.</b> Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
<i>Range of Reading and Level of Text Complexity</i>		
<b>10.</b> By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.	<b>10.</b> By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.	<b>10.</b> By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.

## Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12

[WHST]

The standards below begin at grade 6; standards for pre-k–5 writing in history/social studies, science, and technical subjects are integrated into the pre-k–5 Writing standards. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations—the former providing broad standards, the latter providing additional specificity.

Grades 6–8 students:	Grades 9–10 students:	Grades 11–12 students:
<i>Text Types and Purposes</i>		
<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <ol style="list-style-type: none"><li>Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.</li><li>Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.</li><li>Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.</li><li>Establish and maintain a formal style.</li><li>Provide a concluding statement or section that follows from and supports the argument presented.</li></ol>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <ol style="list-style-type: none"><li>Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.</li><li>Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</li><li>Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</li><li>Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</li><li>Provide a concluding statement or section that follows from or supports the argument presented.</li></ol>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <ol style="list-style-type: none"><li>Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</li><li>Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</li><li>Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</li><li>Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</li><li>Provide a concluding statement or section that follows from or supports the argument presented.</li></ol>

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12

[WHST]

Grades 6–8 students:	Grades 9–10 students:	Grades 11–12 students:
<i>Text Types and Purposes (continued)</i>		
<p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <ul style="list-style-type: none"> <li>a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.</li> <li>b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.</li> <li>c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.</li> <li>d. Use precise language and domain-specific vocabulary to inform about or explain the topic.</li> <li>e. Establish and maintain a formal style and objective tone.</li> <li>f. Provide a concluding statement or section that follows from and supports the information or explanation presented.</li> </ul>	<p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <ul style="list-style-type: none"> <li>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</li> <li>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.</li> <li>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</li> <li>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.</li> <li>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</li> <li>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).</li> </ul>	<p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <ul style="list-style-type: none"> <li>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</li> <li>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.</li> <li>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</li> <li>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</li> <li>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</li> </ul>
<p>3. (See note; not applicable as a separate requirement)</p>	<p>3. (See note; not applicable as a separate requirement)</p>	<p>3. (See note; not applicable as a separate requirement)</p>

**Note:** Students' narrative skills continue to grow in these grades. The standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.

## Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12

[WHST]

Grades 6–8 students:	Grades 9–10 students:	Grades 11–12 students:
<i>Production and Distribution of Writing</i>		
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.	5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.	6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.	6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
<i>Research to Build and Present Knowledge</i>		
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.	7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.	8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard	8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas,

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	format for citation.	avoiding plagiarism and overreliance on any one source and following a standard format for citation.
<b>9</b> Draw evidence from informational texts to support analysis, reflection, and research.	<b>9.</b> Draw evidence from informational texts to support analysis, reflection, and research.	<b>9.</b> Draw evidence from informational texts to support analysis, reflection, and research.
<i>Range of Writing</i>		
<b>10.</b> Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	<b>10.</b> Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	<b>10.</b> Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.