

## Pine Hill Public Schools Curriculum

Content Area:	<b>Science</b>		
Course Title/ Grade Level:	Honors Biology / Grade 9		
Unit 1:	<b>Course Overview &amp; Lab Safety</b>	Duration:	<b>1 week</b>
Unit 2:	<b>Scientific Method</b>	Duration:	<b>1-2 weeks</b>
Unit 3:	<b>Themes of Biology and Characteristics of Life</b>	Duration:	<b>1 week</b>
Unit 4:	<b>Structure and Function of Cells</b>	Duration:	<b>1-2 weeks</b>
Unit 5:	<b>Cell Membrane and Cell Transport</b>	Duration:	<b>1-2 weeks</b>
Unit 6:	<b>Inorganic Chemistry</b>	Duration:	<b>1-2 weeks</b>
Unit 7:	<b>Organic Chemistry</b>	Duration:	<b>1-2 weeks</b>
Unit 8:	<b>Energy and Enzymes</b>	Duration:	<b>1-2 weeks</b>
Unit 9:	<b>Cellular Respiration and Photosynthesis</b>	Duration:	<b>1-2 weeks</b>
Unit 10:	<b>Cell Division/Cell Cycle</b>	Duration:	<b>1 week</b>
Unit 11:	<b>Meiosis and Heredity</b>	Duration:	<b>2-3 weeks</b>
Unit 12:	<b>DNA Replication and Protein Synthesis</b>	Duration:	<b>2-3 weeks</b>
Unit 13:	<b>Biotechnology</b>	Duration:	<b>1-2 weeks</b>
Unit 14:	<b>Evolution</b>	Duration:	<b>1-2 weeks</b>
Unit 15:	<b>Ecology</b>	Duration:	<b>1-2 weeks</b>
Unit 16:	<b>Human Impacts</b>	Duration:	<b>1-2 weeks</b>
Date Created or Revised:	12-2011		
BOE Approval Date:	8/28/12		

<b>Pine Hill Public Schools Science Curriculum</b>	
<b>Unit Title: Course Overview &amp; Lab Safety</b>	<b>Unit #: 1</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>	<b>Length of Time: 1 wk.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• Why is it important to conduct experiments in a safe fashion?</li> <li>• Why is it important to know where the various areas of safety equipment are in the science classroom?</li> <li>• Why is it important to respond appropriately to a safety emergency in the science classroom?</li> <li>• What are the classroom procedures and guidelines in order to be successful?</li> <li>• How can terms be defined using root words?</li> </ul>
<b>Content</b>	<ul style="list-style-type: none"> <li>• Root Words</li> <li>• Personal safety</li> <li>• Equipment safety</li> <li>• Lab procedures</li> <li>• Course Outline               <ul style="list-style-type: none"> <li>- Book intro</li> <li>- Course overview</li> <li>- Grading procedures</li> <li>- Safety</li> </ul> </li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Determine the meaning of scientific terminology by utilizing the Greek/Latin root words.</li> <li>• Understand the course objectives</li> <li>• Understand the course sequence</li> <li>• Understand the classroom procedures and rules</li> <li>• Introduce lab safety procedures</li> <li>• Develop an understanding of inquiry based science</li> <li>• Perform experiments using proper safety procedures</li> </ul>
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Homework/class work</li> <li>• Lab safety evaluation</li> <li>• Performance during lab experiments</li> <li>• Safety implementation during a laboratory experiment</li> </ul>

<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student’s level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

**Standard:** 5.1

**Strand(s):** D

**Content Statement(s):**

**CPI # / CPI(s):**

Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Scientific Method</b>		<b>Unit #:2</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• What is the relationship between the advancement of science alongside the advancement of technology?</li> <li>• What is the process of the scientific method?</li> <li>• How can the scientific method be used in science, as well as, every day life?</li> <li>• What are the important elements in a valid scientific experiment (control group, experiment group, independent/dependent variables)</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Scientific Method</li> <li>• The process of the scientific method</li> <li>• Independent/ Dependent variables</li> <li>• Control Group vs. Experimental Group</li> <li>• Lab Safety</li> <li>• Lab Report Writing Skills</li> <li>• Inquiring, observing, and discovering as a way to build science knowledge from the known to the unknown</li> <li>• Root Words Related to Topic</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Identify and explain the process of the scientific method.</li> <li>• Design and perform experiments using the scientific method</li> <li>• Demonstrate inquiry-based skills while implementing the scientific method.</li> <li>• Describe the relationship between advancements in science and technology.</li> <li>• Demonstrate proper safety procedures in the laboratory</li> <li>• Understand the difference between independent and dependent variables</li> <li>• Properly utilize scientific instruments</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Lab Safety Evaluation (100% mandatory)</li> <li>• Scientific Method Activities</li> <li>• Homework/class work</li> <li>• Unit test/ quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	

<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> <li>• Dissection (after standardized exam)</li> </ul>

**2009 NJCCCS**

**Standard: 5.1**

**Strand(s): D**

**Content Statement(s):**

**CPI # / CPI(s):**

Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

<b>Pine Hill Public Schools Science Curriculum</b>	
<b>Unit Title:</b>	<b>Themes of Biology and Characteristics of Life</b>
	<b>Unit #: 3</b>
<b>Course or Grade Level:</b>	<b>Honors Lab Bio (9<sup>th</sup>)</b>
	<b>Length of Time: 1 wk.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How do the themes of biology unite the areas of study?</li> <li>• How are scientific practices/occupations implemented in the community?</li> <li>• What are some important biology oriented careers?</li> <li>• What are the essential characteristics that all living organisms share?</li> <li>• How does structure relate to function in living systems from the organism to the cellular level?</li> </ul>
<b>Content</b>	<ul style="list-style-type: none"> <li>• Activity involving characteristics of life</li> <li>• Characteristics of life handouts</li> <li>• Online research of science careers</li> <li>• Root Words Related to Topic</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Explain the themes which unite biology</li> <li>• Describe the characteristics of all life</li> <li>• Develop an understanding of inquiry based science</li> <li>• Computer skills involving research &amp; technology</li> <li>• Understand and research scientific careers in the community</li> <li>• Book Familiarization and utilization</li> </ul>
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Science Career Brochure</li> <li>• Chapter 1 Homework/Quiz</li> </ul>
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>

<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>						
<b>2009 NJCCCS</b>							
<b>Standard:</b> 5.1							
<b>Strand(s):</b> A,B,C,D							
<b>Content Statement(s):</b>				<b>CPI # / CPI(s):</b>			
<b><u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Structure and Function of Cells</b>		<b>Unit #: 4</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How have the advances in microscope technology affected the field of biology in cellular study?</li> <li>• How do the parts of the cell relate to the function of the cell as a unit?</li> <li>• What is the difference between prokaryotes and eukaryotes? Plant and animal cells?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Technology <ul style="list-style-type: none"> <li>- Types of microscopes</li> <li>- Cell theory</li> </ul> </li> <li>• Types of cells <ul style="list-style-type: none"> <li>- Prokaryote</li> <li>- Eukaryote</li> <li>- Plant and animal cells</li> </ul> </li> <li>• Parts of cell <ul style="list-style-type: none"> <li>- Organelles</li> <li>- Structure and function of organelles</li> </ul> </li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe microscopes and use</li> <li>• Use a compound light microscope</li> <li>• Create a wet mount slide</li> <li>• Describe parts of the cell theory</li> <li>• Differentiate between prokaryotes and eukaryotes</li> <li>• Differentiate between animal and plant cells</li> <li>• Describe function of cell organelles</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Introductory Microscopy Lab</li> <li>• Plant and Animal Cell Lab</li> <li>• Unit Test/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	



<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

**Standard:** 5.3

**Strand(s):** A. Organization and Development

**Content Statement(s):**

**CPI # / CPI(s):**

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

<b>Pine Hill Public Schools Science Curriculum</b>	
<b>Unit Title: Cell Membrane and Cell Transport</b>	
<b>Unit #: 5</b>	
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>	<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How are substances transported into and out of the cell to maintain homeostasis?</li> <li>• How do responses to external and internal stimuli lead to the survival of an organism?</li> </ul>
<b>Content</b>	<ul style="list-style-type: none"> <li>• Describe the major structure and functions of the cell membrane               <ul style="list-style-type: none"> <li>- Fluid Mosaic Model</li> <li>- Passive and Active Transport</li> </ul> </li> <li>• Explain how the structure of the plasma membrane makes it semi-permeable</li> <li>• Describe and distinguish between the processes of diffusion/facilitated diffusion</li> <li>• Describe the types of passive transport and how they occur</li> <li>• Describe the types of active transport and how they occur</li> <li>• Compare and contrast hypertonic, hypotonic, and isotonic solutions</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Recognize that cell membranes are selectively permeable and maintain optimal internal conditions through transport</li> <li>• Predict a cell's response in a given set of environmental conditions</li> <li>• Conduct investigations and use results of measurements/observations to refine predictions and explanations</li> </ul>
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Homework/Class work</li> <li>• quiz</li> <li>• test</li> <li>• Labs investigation osmosis and diffusion</li> </ul>
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>

<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>						
<b>2009 NJCCCS</b>							
<b>Standard:</b> 5.3							
<b>Strand(s):</b> A. Organization and Development							
<b>Content Statement(s):</b>				<b>CPI # / CPI(s):</b>			
Predict a cells response in a given set of environmental conditions.							
<b><u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Inorganic Chemistry</b>		<b>Unit #: 6</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Date Created: 12-12-11</b>		<b>BOE Approval Date:</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• Why is life studied at the atom and molecular level?</li> <li>• How can an atomic reactivity be determined by its placement in the periodic table and how is this important in terms of the type of chemical bond it will form?</li> <li>• What are the characteristics of water that give it the essential properties to life?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Periodic Table               <ul style="list-style-type: none"> <li>- Atom, Molecule, Element and Compound</li> <li>- Atomic Number, Atomic Mass and Isotopes</li> <li>- Types of Bonds and properties of each</li> <li>- Drawing types of bonds</li> </ul> </li> <li>• Properties of Water               <ul style="list-style-type: none"> <li>- Cohesion and Hydrogen bonds</li> <li>- Solutes, Solvent and Solution</li> </ul> </li> <li>• pH               <ul style="list-style-type: none"> <li>- how scale is used</li> <li>- how pH affects life</li> </ul> </li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Understand the differences between inorganic and organic compounds</li> <li>• Explain how functional groups identify properties of macromolecules</li> <li>• Identify types of functional groups</li> <li>• Explain how carbohydrates are used by the body</li> <li>• Explain how the non polar properties of lipids are essential for life</li> <li>• Explain the 7 types of proteins and how their shape determines function</li> <li>• Explain how enzymes are important to reduce energy needed for reactions to occur</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Chemical Aspects of Life Lab Amylase Lab</li> <li>• Unit: Test/ quizzes Life Lab</li> <li>• Lab Practical for Macromolecules Lab</li> </ul>	

<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student’s level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

**Standard:** 5.3

**Strand(s):** A. Organization and Development

**Content Statement(s):**

**CPI # / CPI(s):**

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

<b>Pine Hill Public Schools Science Curriculum</b>	
<b>Unit Title:</b> <b>Organic Chemistry</b>	<b>Unit #: 7</b>
<b>Course or Grade Level:</b> <b>Honors Lab Bio (9<sup>th</sup>)</b>	<b>Length of Time:</b> <b>1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• Why is carbon essential for life?</li> <li>• How are functional groups used to identify properties of organic macromolecules?</li> <li>• What are the monomers of the 4 macromolecules and how do cells use each of them?</li> <li>• Why are shape and function of the macromolecule related?</li> </ul>
<b>Content</b>	<ul style="list-style-type: none"> <li>• Organic Compounds <ul style="list-style-type: none"> <li>- Functional groups</li> <li>- Carbs</li> <li>- Lipids</li> <li>- Proteins</li> <li>Nucleic Acids</li> </ul> </li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Understand the differences between inorganic and organic compounds</li> <li>• Explain how functional groups identify properties of macromolecules</li> <li>• Identify types of functional groups</li> <li>• Explain how carbohydrates are used by the body</li> <li>• Explain how the non polar properties of lipids are essential for life</li> <li>• Explain the 7 types of proteins and how their shape determines function</li> <li>• Explain how enzymes are important to reduce energy needed for reactions to</li> </ul>
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Chemical Aspects of Life Lab Amylase Lab</li> <li>• Unit: Test/ quizzes Life Lab</li> <li>• Lab Practical for Macromolecules Lab</li> </ul>
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter- disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>

<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>		
<b>2009 NJCCCS</b>			
<b>Standard:</b> 5.3			
<b>Strand(s):</b> B. Matter and Energy Transformations			
<b>Content Statement(s):</b>	<b>CPI # / CPI(s):</b>		
<b><u>21<sup>st</sup> Century Themes</u></b>			
Global Awareness	Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>			
Creativity and Innovation	Critical Thinking and Problem Solving	Communication and Collaboration	Information Literacy
Media Literacy	ICT Literacy	Life and Career Skills	

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Energy and Enzymes</b>		<b>Unit #: 8</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How is energy transferred and transformed in living systems?</li> <li>• How do enzymes reduce the amount of energy needed by a cell?</li> <li>• How can enzymes be affected by changes in temp, pH or chemical factors?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Energy use</li> <li>• Types of reactions</li> <li>• ATP</li> <li>• Enzymes</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe how energy transfer occur in the cell</li> <li>• Differentiate between endergonic and exergonic reactions</li> <li>• Explain how ATP is used by the cell for energy</li> <li>• Describe how enzyme shape is critical to function</li> <li>• Explain why enzymes are essential to life</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Enzyme Lab</li> <li>• Diffusion Lab</li> <li>• Unit test/quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>	
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> <li>• <i>Lorenzo's Oil</i></li> </ul>	



<b>2009 NJCCCS</b>							
<b>Standard:</b> 5.3							
<b>Strand(s):</b> B. Matter and Energy Transformations							
<b>Content Statement(s):</b>				<b>CPI # / CPI(s):</b>			
<b><u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

<b>Pine Hill Public Schools Science Curriculum</b>	
<b>Unit Title: Cellular Respiration and Photosynthesis</b>	
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>	<b>Unit #: 9</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>	<b>Length of Time: 2-4wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How does the cell transfer energy from glucose to ATP during respiration?</li> <li>• How are oxidation-reduction reactions used throughout cellular respiration?</li> <li>• How are autotrophs and heterotrophs connected to each other through cellular respiration and photosynthesis?</li> <li>• How are plants capable of converting kinetic energy into chemical energy during photosynthesis?</li> </ul>
<b>Content</b>	<ul style="list-style-type: none"> <li>• Cellular Respiration <ul style="list-style-type: none"> <li>- Aerobic vs. Anaerobic</li> <li>- Substrate level phosphorylation</li> <li>- Energy conversions during glycolysis, Krebs' cycle and ETC</li> </ul> </li> <li>• Photosynthesis <ul style="list-style-type: none"> <li>- Photosystems</li> <li>- Calvin Cycle</li> </ul> </li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Discuss how aerobic and anaerobic respiration are related.</li> <li>• Differentiate between substrate level phosphorylation and how each is used for energy conversion to ATP.</li> <li>• Describe the stages of cellular respiration and the importance of oxidation reduction reactions</li> <li>• Differentiate the energy needs of autotrophs and heterotrophs</li> <li>• Describe the stages of photosynthesis and the energy conversions that occur throughout</li> <li>• Explain how autotrophs and heterotrophs are ultimately reliant on each other for their energy needs</li> </ul>
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Fermentation Lab</li> <li>• Cellular Respiration Activity</li> <li>• Unit Tests/quizzes</li> </ul>
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>

<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

**Standard:** 5.3

**Strand(s):** B. Matter and Energy Transformations

**Content Statement(s):**

**CPI # / CPI(s):**

Investigate and describe the complementary relationship between photosynthesis and cellular respiration.

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Cell Division/Cell Cycle</b>		<b>Unit #: 10</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1 wk.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How is life dependent upon cell reproduction?</li> <li>• How are asexual and sexual reproduction different?</li> <li>• What happens when cells do not obey controls during cell division?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Asexual reproduction</li> <li>• Mitosis</li> <li>• Controls of cell cycle</li> <li>• Cancer</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Differentiate between sexual and asexual reproduction</li> <li>• Discuss importance of like begets like in mitosis.</li> <li>• Describe stages of the cell cycle in mitosis.</li> <li>• Discuss how cell growth is controlled by cell during division.</li> <li>• Discuss how cancer can develop from lack of cell controls during division.</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Mitosis Slide Lab</li> <li>• Unit Test/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>	
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>	

<b>Strand(s):</b> D. Heredity and Reproduction							
<b>Content Statement(s):</b>							
Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).					<b>CPI # / CPI(s):</b>		
<b>Strand(s):</b> D. Heredity and Reproduction							
<b>Content Statement(s):</b>							
<u><b>21<sup>st</sup> Century Themes</b></u>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<u><b>21<sup>st</sup> Century Skills</b></u>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Meiosis and Heredity</b>		<b>Unit #: 11</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 2-3 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How does meiosis promote genetic variation?</li> <li>• How can Punnett squares be used to predict genetic outcome of offspring?</li> <li>• How do chromosomes carry information in genes?</li> <li>• How can mutations within a gene lead to genetic disorders?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• History of Genetics</li> <li>• Meiosis               <ul style="list-style-type: none"> <li>- Stages of cell cycle</li> <li>- Genetic variation</li> </ul> </li> <li>• Genetic Inheritance               <ul style="list-style-type: none"> <li>- Monohybrid cross</li> <li>- Dihybrid cross</li> <li>- Multiple alleles</li> <li>- Codominance</li> <li>- Incomplete dominance</li> </ul> </li> <li>• Genetic Disorders</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe the history of genetic through Mendel’s discoveries</li> <li>• Differentiate between phenotype and genotype</li> <li>• Create and interpret Punnett squares for monohybrid, dihybrid, incomplete dominance, codominance, multiple alleles and sex linked genetic crosses</li> <li>• Discuss how meiosis promotes genetic variation and link to natural selection</li> <li>• Discuss genetic disorders and advances in diagnosis and treatment</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Genetic Crosses Activities</li> <li>• Human Genetics Lab</li> <li>• Karyotype Lab</li> <li>• Genetic Disorder Project with presentations</li> <li>• Unit Test/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student’s level of functioning</li> <li>• Use multi sensory approach</li> </ul>	

<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

Standard:5.3.12

Strand(s):D.3

Content Statement(s): Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring.

CPI # / CPI(s):

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: DNA Replication and Protein Synthesis</b>		<b>Unit #: 12</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 2-3 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• Why is DNA the storehouse of information for heritable traits?</li> <li>• How is the information encoded by DNA translated into a protein?</li> <li>• What methods does a cell employ to ensure proper encoding?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• History of DNA</li> <li>• Structure of DNA</li> <li>• DNA replication</li> <li>• Transcription Translation</li> <li>• Protein Synthesis</li> <li>• Gene Controls</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe the history of DNA</li> <li>• Draw the structure of DNA</li> <li>• Describe the process of DNA replication</li> <li>• Explain how proteins are made from DNA code</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Protein Synthesis Essay</li> <li>• DNA Extraction</li> <li>• Unit Tests/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	
<b>Inter- disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>	
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> </ul>	



	<ul style="list-style-type: none"> <li>• Computer access</li> </ul>
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**2009 NJCCCS**

Standard:5.3.12

Strand(s):E.3

	CPI # / CPI(s):

**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Biotechnology</b>		<b>Unit #: 13</b>
<b>Course or Grade Level:</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• What are current applications of biotechnology??</li> <li>• How has the human genome project influenced biotechnology?</li> <li>• How has genetic engineering influenced the treatment for genetic disorders?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• DNA fingerprinting</li> <li>• Restriction Enzymes</li> <li>• Electrophoresis</li> <li>• PCR</li> <li>• Gene Therapy</li> <li>• Recombinant DNA</li> <li>• Chromosome Map</li> <li>• Human Genome Project</li> <li>• Genetic Diseases</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Explain human genome project DNA fingerprinting</li> <li>• DNA fingerprinting analysis</li> <li>• Explain how biotechnology influences the field of genetic disorders</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• DNA fingerprinting</li> <li>• Current Events in Biotechnology</li> <li>• Current Events in Human Genetic Diseases</li> <li>• Unit Tests/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>-Provide advanced notice of tests</li> <li>-Include hands-on activities</li> <li>-Provide material at student's level of functioning</li> <li>-Use multi sensory approach</li> </ul>	
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>- Mathematical connections</li> <li>- Connection to English</li> <li>- Science and society</li> <li>- Scientific discoveries and the link to Ethics</li> </ul>	

<b>Lesson resources / Activities</b>	-Homework/ Class work -Quiz -Test -Online activities - <i>GATACCA Movie</i>					
<b>2009 NJCCCS</b>						
Standard:5.3.12						
Strand(s):E.3						
					CPI # / CPI(s):	
<b><u>21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>						
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration	Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills	

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Evolution</b>		<b>Unit #: 14</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• What is the evidence to support natural selection?</li> <li>• How have the theories for evolutionary thought changed over time?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• History of Evolutionary Thought</li> <li>• Charles Darwin and theory of Natural Selection</li> <li>• Mechanisms of evolution</li> <li>• Evidences of evolution</li> <li>• Microevolution</li> <li>• Macroevolution</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Explain how various views of evolution have progressed over time</li> <li>• Summarize Charles Darwin's Theory of Natural Selection</li> <li>• Identify modes of selection and mechanisms of evolution</li> <li>• Explain supporting evidence of microevolution and macroevolution</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Natural Selection Lab/Activity</li> <li>• Unit Tests/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>	

<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>						
<b>2009 NJCCCS</b>							
Standard:5.3.12							
Strand(s):E.3							
Content Statement(s): Provide a scientific explanation for the history of life on Earth using scientific evidence.				CPI # / CPI(s):			
<b><u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Ecology</b>		<b>Unit #: 15</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How do abiotic limiting factors affect the biotic component of an ecosystem?</li> <li>• How are biotic components of an ecosystem adapted for survival?</li> <li>• What affects the population growth of a community and its carrying capacity?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Biomes               <ul style="list-style-type: none"> <li>- Abiotic limiting factors</li> <li>- Biotic adaptations for survival</li> </ul> </li> <li>• Population Study               <ul style="list-style-type: none"> <li>- Human Populations Studies</li> <li>- Growth Rate Calculations</li> </ul> </li> <li>• Community –               <ul style="list-style-type: none"> <li>- Food Chains/Webs</li> <li>- Cycling of Matter and Energy</li> <li>- Adaptations for Survival</li> </ul> </li> <li>• Learning Behaviors</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe how abiotic factors limit biotic component of an ecosystem</li> <li>• Describe the main terrestrial biomes</li> <li>• Explain how biotic communities have adapted for survival with feeding relationships, competition and predation</li> <li>• Compare and contrast life history patterns</li> <li>• Describe the stages of primary and secondary succession</li> <li>• Describe why energy flows in one directions while matter is cycled through an ecosystem</li> <li>• Explain how populations are measured</li> <li>• Calculate growth rate of population when given date</li> <li>• Describe changes in human population</li> <li>• Describe the 7 learning behaviors</li> <li>• Explain how behavior is an indicator of evolutionary adaptation</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• Energy Pyramids &amp; Rood Webs/Chains</li> <li>• Unit tests/Quizzes</li> </ul>	

<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>
<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>

**2009 NJCCCS**

**Standard:** 5.3

**Strand(s):** A. Organization and Development

Analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.

**CPI # / CPI(s):**


**21<sup>st</sup> Century Themes**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
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**21<sup>st</sup> Century Skills**

	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

**Pine Hill Public Schools  
Science Curriculum**

<b>Unit Title: Human Impacts</b>		<b>Unit #: 16</b>
<b>Course or Grade Level: Honors Lab Bio (9<sup>th</sup>)</b>		<b>Length of Time: 1-2 wks.</b>
<b>Pacing</b>	Dependent upon student comprehension, school calendar, and benchmark/state testing.	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How have human activities limited the natural cycles of materials?</li> <li>• What are the effects of increasing demands and decreasing supply of natural resources on global ecology?</li> <li>• What are the consequences of harvesting natural resources from an ecosystem?</li> </ul>	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Natural Resources</li> <li>• Overpopulation and Ecological Footprint</li> </ul>	
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Describe how human activities have limited the natural cycles of materials</li> <li>• Describe the effect of increasing populations on natural resources</li> <li>• Explain how human activity has affected the cycling of matter and energy in the ecosystem</li> <li>• Describe how the natural environment has changed since humans have inhabited the Earth</li> <li>• Identify various forms of air, land and water pollution</li> </ul>	
<b>Math Skills/ Science Processes</b>	<ul style="list-style-type: none"> <li>• Scientific Measurement/Notation</li> <li>• Math word problems</li> <li>• Algebra application</li> <li>• Probability</li> <li>• Graphing</li> <li>• Data analysis</li> </ul>	
<b>Assessments</b>	<ul style="list-style-type: none"> <li>• A Human Impact Research Project</li> <li>• Unit Tests/Quizzes</li> </ul>	
<b>Interventions / differentiated instruction</b>	<ul style="list-style-type: none"> <li>• Provide advanced notice of tests</li> <li>• Include hands-on activities</li> <li>• Provide material at student's level of functioning</li> <li>• Use multi sensory approach</li> </ul>	
<b>Inter-disciplinary Connections</b>	<ul style="list-style-type: none"> <li>• Mathematical connections</li> <li>• Connection to English</li> <li>• Science and society</li> <li>• Scientific discoveries and the link to Ethics</li> </ul>	



<b>Lesson resources / Activities</b>	<ul style="list-style-type: none"> <li>• Hands-on activities</li> <li>• Laboratories related to the subject matter</li> <li>• Word processing systems</li> <li>• Computer access</li> </ul>						
<b>2009 NJCCCS</b>							
<b>Standard:</b> 5.3							
<b>Strand(s):</b> A. Organization and Development							
Analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.					<b>CPI # / CPI(s):</b>		
<b><u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>21<sup>st</sup> Century Skills</u></b>							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		