<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Nature of Science</td>
<td>1 week</td>
</tr>
<tr>
<td>2</td>
<td>The Way Science Works</td>
<td>1 week</td>
</tr>
<tr>
<td>3</td>
<td>Chemistry: Matter</td>
<td>2 weeks</td>
</tr>
<tr>
<td>4</td>
<td>Chemistry: Atoms and Interactions</td>
<td>12 days</td>
</tr>
<tr>
<td>5</td>
<td>The Periodic Table of Elements</td>
<td>1 week</td>
</tr>
<tr>
<td>6</td>
<td>The Structure of Matter</td>
<td>10 days</td>
</tr>
<tr>
<td>7</td>
<td>Chemistry: Chemical Reactions</td>
<td>2 weeks</td>
</tr>
<tr>
<td>8</td>
<td>Organic and Biochemical Compounds</td>
<td>1 week</td>
</tr>
<tr>
<td>9</td>
<td>Solutions and Mixtures</td>
<td>1 week</td>
</tr>
<tr>
<td>10</td>
<td>Acids, Bases and Salts</td>
<td>7 days</td>
</tr>
<tr>
<td>11</td>
<td>Nuclear Changes</td>
<td>14 days</td>
</tr>
<tr>
<td>12</td>
<td>Physics: Motion</td>
<td>15 days</td>
</tr>
<tr>
<td>13</td>
<td>Forces</td>
<td>18 days</td>
</tr>
<tr>
<td>14</td>
<td>Work and Energy</td>
<td>1 week</td>
</tr>
<tr>
<td>15</td>
<td>Heat and Temperature</td>
<td>1 week</td>
</tr>
<tr>
<td>16</td>
<td>Waves</td>
<td>1 week</td>
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<tr>
<td>17</td>
<td>Sound and Light</td>
<td>1 week</td>
</tr>
<tr>
<td>18</td>
<td>Electricity and Magnetism</td>
<td>3 weeks</td>
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</table>

BOE Approval Date: August 28, 2012
# Science Curriculum

## Unit Title: The Nature of Science

### Course or Grade Level: Inquiry into the Sciences  
### Length of Time: 1 week

### Pacing

#### Essential Questions
- How do Scientists explore the world?
- How are the many types of science organized?
- What are scientific theories, and how are they different from scientific laws?
- How can I think and act like a scientist?
- How do scientists measure things?

#### Content
- Root Words
- Steps of the scientific method
- Controls vs. Variables
- Data collection and organization methods
- Inquiring, observing, and discovering as a way to build science knowledge from the known to the unknown

#### Skills
- List the branches of science
- Differentiate between scientific laws and theories
- Use the Scientific Method to solve problems
- Determine the meaning of a term based on its root words
- Design and perform experiments using the scientific method

#### Math Skills/Science Processes
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

#### Assessments
- Homework/class work
- Quiz
- Test
- Inquiry lab on scientific method

#### Interventions / Differentiated Instruction
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi-sensory approach

#### Interdisciplinary Connections
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

#### Lesson Resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

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**2009 NJCCCS**

**Standard:** 5.1  
**Strand(s):** D
### Content Statement(s):
Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

### 21st Century Themes

<table>
<thead>
<tr>
<th>Global Awareness</th>
<th>Financial, Economic, Business, and Entrepreneurial Literacy</th>
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</table>

### 21st Century Skills

<table>
<thead>
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<td></td>
<td>Life and Career Skills</td>
</tr>
<tr>
<td>Pacing</td>
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<tr>
<td>------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Essential Questions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>What are the Units of Measurement?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>What are the tools scientists use?</td>
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</tr>
<tr>
<td>Why is organizing data an important science skill?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>How do scientists handle very small or very large numbers?</td>
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<tr>
<td>How can you tell the precision of a measurement?</td>
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<table>
<thead>
<tr>
<th>Content</th>
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<tbody>
<tr>
<td>- Data collection and organization methods</td>
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<tr>
<td>- Inquiring, observing, and discovering as a way to build science knowledge from the known to the unknown</td>
</tr>
<tr>
<td>- Presenting scientific data</td>
</tr>
<tr>
<td>- Writing numbers in scientific notation</td>
</tr>
<tr>
<td>- Using significant figures</td>
</tr>
</tbody>
</table>

<table>
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<tr>
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<tr>
<td>- List the tools scientists use to perform experiments</td>
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<tr>
<td>- Using correct significant figures when recording numerical data</td>
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<tr>
<td>- Creating and using Line, Bar, and Pie Graphs</td>
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<tr>
<td>homework/class work</td>
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<tr>
<td>- quiz</td>
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<tr>
<td>- test</td>
</tr>
<tr>
<td>- Laboratories</td>
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<th>Interventions / differentiated instruction</th>
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<tr>
<td>- Provide advanced notice of tests</td>
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<td>- Provide material at student's level of functioning</td>
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<tr>
<td>- Use multi sensory approach</td>
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<tr>
<td>- Scientific discoveries and the link to Ethics</td>
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<tr>
<td>- Word processing systems</td>
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<tr>
<td>- Computer access</td>
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2009 NJCCCS

Standard: 5.1

Strand(s): A,B,C,D

Content Statement(s): CPI # / CPI(s):
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<td>Critical Thinking and Problem Solving</td>
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<td>ICT Literacy</td>
<td></td>
<td>Life and Career Skills</td>
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</table>
### Pine Hill Public Schools
#### Science Curriculum

<table>
<thead>
<tr>
<th>Unit Title: Chemistry: Matter</th>
<th>Unit # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course or Grade Level: Inquiry into the Sciences</td>
<td>Length of Time: 2 weeks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pacing</th>
<th></th>
</tr>
</thead>
</table>
| Essential Questions | - How can matter be classified?  
- Why are Carbon and Copper classified as elements?  
- How are elements related to compounds?  
- What is the difference between a pure substance and a mixture?  
- Why are color, volume and density classified as physical properties?  
- Why are flammability and reactivity classified as chemical properties? |

<table>
<thead>
<tr>
<th>Content</th>
<th></th>
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</thead>
</table>
| - Elements and symbols  
- Compounds  
- Substance and mixtures  
- Water  
- Physical properties  
- Chemical properties |

<table>
<thead>
<tr>
<th>Skills</th>
<th></th>
</tr>
</thead>
</table>
| - Classifying matter  
- List the properties of an element  
- Differentiate between compounds and mixtures  
- List the three phases of matter  
- Energy and changes of state  
- Properties of gas |

<table>
<thead>
<tr>
<th>Math Skills/Science Processes</th>
<th></th>
</tr>
</thead>
</table>
| - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- Graph of graphs and charts |

<table>
<thead>
<tr>
<th>Assessments</th>
<th></th>
</tr>
</thead>
</table>
| - Homework/class work  
- Quiz  
- Test  
- Labs on using pH (biological buffers, antacids), building molecular models |

<table>
<thead>
<tr>
<th>Interventions / differentiated instruction</th>
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</table>
| - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |

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| - Mathematical connections  
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| - Hands-on activities  
- Laboratories related to the subject matter  
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2009 NJCCCS

<table>
<thead>
<tr>
<th>Standard: 5.3</th>
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</table>
### Strand(s): A

| 5.3.12.C.1 |

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<td>Global Awareness</td>
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<tr>
<td>Media Literacy</td>
</tr>
<tr>
<td>Pine Hill Public Schools</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Science Curriculum</td>
</tr>
</tbody>
</table>

### Unit Title: Chemistry: Atoms and Interactions

#### Course or Grade Level: Inquiry into the Sciences

| Length of Time: 12 Days |

#### Pacing

<table>
<thead>
<tr>
<th>Essential Questions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- What is an atom?</td>
<td></td>
</tr>
<tr>
<td>- Who came up with the first atomic theory?</td>
<td></td>
</tr>
<tr>
<td>- What is the difference between protons, neutrons, and electrons?</td>
<td></td>
</tr>
<tr>
<td>- What do all atoms have in common?</td>
<td></td>
</tr>
<tr>
<td>- What is the modern model of an atom?</td>
<td></td>
</tr>
</tbody>
</table>

#### Content

- Modern models of an atom
- Electron energy levels
- Atomic number and Mass number
- Importance of specific elements (carbon, oxygen, hydrogen, nitrogen, phosphorus, sulfur)
- Isotopes

#### Skills

- Describe the structure and function of the parts of an atom
- Describe how atoms interact
- Describe the unique properties of atoms
- Model (using physical or digital tools) the major categories of inorganic molecules
- Conduct experiments to demonstrate the impact of various conditions on atoms

#### Math Skills/Science Processes

- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

#### Assessments

- Homework/class work
- Quiz
- Test
- Laboratories

#### Interventions / Differentiated Instruction

- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi-sensory approach

#### Interdisciplinary Connections

- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

#### Lesson resources / Activities

- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

2009 NJCCCS

### Standard:
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### Content Statement(s):

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<td>Media Literacy</td>
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</table>
## Pine Hill Public Schools
### Science Curriculum

<table>
<thead>
<tr>
<th>Unit Title: The Periodic Table of Elements</th>
<th>Unit # 5</th>
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<tbody>
<tr>
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<td>Length of Time: 1 week</td>
</tr>
<tr>
<td>Pacing</td>
<td></td>
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</tbody>
</table>
| **Essential Questions** | - How are the elements arranged in the modern periodic table?  
- Why do the elements within a group on the periodic table have the same properties?  
- What happens to an atom when it gains or loses electrons?  
- What are the main categories of elements? |
| **Content** | - Arrangement of the periodic table  
- The role of electrons  
- Ion formation  
- Classifying elements  
- Metals, Non-metals, Noble gases, Halogens  
- Semiconductors |
| **Skills** | - Identifying patterns of elemental properties related to positioning on the periodic table  
- Identify the role of electrons in chemical reactions  
- List the properties of Metals, Non-metals, Noble gases, Halogens |
| **Math Skills/Science Processes** | - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- Graph of graphs and charts |
| **Assessments** | - Homework/class work  
- Quiz  
- Test  
- Labs on the microscope, investigating cell types |
| **Interventions / differentiated instruction** | - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |
| **Interdisciplinary Connections** | - Mathematical connections  
- Connection to English  
- Science and society  
- Scientific discoveries and the link to Ethics |
| **Lesson resources / Activities** | - Hands-on activities  
- Laboratories related to the subject matter  
- Word processing systems  
- Computer access |

**2009 NJCCCS**

**Standard:** 5.3

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

Predict a cell's response in a given set of environmental conditions.

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## Pine Hill Public Schools
### Science Curriculum

<table>
<thead>
<tr>
<th>Unit Title: The Structure of Matter</th>
<th>Unit #6</th>
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<tbody>
<tr>
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### Pacing

<table>
<thead>
<tr>
<th>Essential Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- What holds a compound together?</td>
</tr>
<tr>
<td>- What determines the properties of a compound?</td>
</tr>
<tr>
<td>- Why do atoms form bonds?</td>
</tr>
<tr>
<td>- How do ionic compounds form?</td>
</tr>
<tr>
<td>- What gives metals their distinct properties?</td>
</tr>
<tr>
<td>- How are compounds named?</td>
</tr>
</tbody>
</table>

### Content

| - Compounds and Molecules |
| - Ionic and Covalent Bonding |
| - Compound names and formulas |
| - Organic and Bio-chemical compounds |

### Skills

- Review ionic, covalent, and hydrogen bonding
- Use Lewis structures to show the difference between ionic and covalent bonding
- Define isotopes and explain how they are used in biological research and medicine
- Differentiate between acids and bases
- Describe the importance of pH to maintain homeostasis in living things
- Explain how structure affects chemical properties

### Math Skills/Science Processes

- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

### Assessments

- Homework/Class work
- Quiz
- Test
- Labs investigation osmosis and diffusion

### Benchmark #1

- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

### Interdisciplinary Connections

- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

### Lesson resources / Activities

- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

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2009 NJCCCS
### Standard:

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# Pine Hill Public Schools Science Curriculum

## Unit Title: Chemistry: Chemical Reactions

<table>
<thead>
<tr>
<th>Course or Grade Level: Inquiry into the Sciences</th>
<th>Length of Time: 2 weeks</th>
</tr>
</thead>
</table>

## Unit # 7

### Pacing

### Essential Questions
- When do chemical reactions take place?
- What is the role of oxygen in chemical reactions?
- How do you balance a chemical equation?
- What does a catalyst do?
- What are the factors affecting reaction rates?

### Content
- The nature of chemical reactions
- Chemical equations
- Balanced equations a mole ratios
- Reaction types
- Electrons and chemical reaction
- Reaction rates and equilibrium

### Skills
- Describe the reactants and products of a chemical reaction
- List the properties of Endothermic and exothermic reactions
- Balance chemical equations as to show conservation of mass
- Use patterns to identify types of chemical reactions and predict the products
- Use the elemental mass of a compound to determine it’s empirical formula

### Math Skills/Science Processes
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

### Assessments
- Homework/Class work
- Quiz
- Test
- Cancer activity

### Interventions / Differentiated instruction
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

### Interdisciplinary Connections
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

### Lesson resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

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**2009 NJCCCS Standard:** 5.3
**Strand(s):** B. Matter and Energy Transformations

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<th>Content Statement(s):</th>
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<tbody>
<tr>
<td>Investigate and describe the complementary relationship between photosynthesis and cellular respiration.</td>
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## Pine Hill Public Schools
### Science Curriculum

<table>
<thead>
<tr>
<th>Unit Title: Organic and Biochemical Compounds</th>
<th>Unit # 8</th>
</tr>
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<tbody>
<tr>
<td>Course or Grade Level: Inquiry into the Sciences</td>
<td>Length of Time: 1 week</td>
</tr>
<tr>
<td>Pacing</td>
<td></td>
</tr>
<tr>
<td><strong>Essential Questions</strong></td>
<td>- How does structure relate to function in living systems from the cellular level to the level of the organism as a whole?</td>
</tr>
</tbody>
</table>
| **Content** | - Importance of specific elements (carbon, oxygen, hydrogen, nitrogen, phosphorus, sulfur)  
- Dehydrations synthesis and hydrolysis  
- Macromolecules (structure and function)  
- Enzymes (function) |
| **Skills** | - Describe the structure and function of the four major types of organic molecules  
- Describe how polymers are built and broken down  
- Describe the unique properties of enzymes  
- Model (using physical or digital tools) the four major categories of organic molecules  
- Conduct experiments to demonstrate the impact of various conditions on enzymes |
| **Math Skills/Science Processes** | - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- Graph of graphs and charts |
| **Assessments** | - Homework/class work  
- Quiz  
- Test  
- Labs: Qualitative Identification of macromolecules, miscibility lab |
| **Interventions /differentiated instruction** | - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |
| **Inter-disciplinary Connections** | - Mathematical connections  
- Connection to English  
- Science and society  
- Scientific discoveries and the link to Ethics |
| **Lesson resources /Activities** | - Hands-on activities  
- Laboratories related to the subject matter  
- Word processing systems  
- Computer access |

### 2009 NJCCCS

| Strand(s): | |
| Content Statement(s): | |
| CPI # / CPI(s): | |
### 21st Century Themes

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### 21st Century Skills

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Pine Hill Public Schools  
Science Curriculum

<table>
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<tr>
<th>Unit Title: Solutions and Mixtures</th>
<th>Unit #9</th>
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<tbody>
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Pacing  

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<th>Content</th>
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<tr>
<td>What is a homogeneous solution?</td>
<td>-Heterogeneous mixture</td>
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<tr>
<td>What is a heterogeneous solution?</td>
<td>-Homogeneous mixture</td>
</tr>
<tr>
<td>What is solubility?</td>
<td>-Water: A common solvent</td>
</tr>
<tr>
<td>Why is water called the universal solvent?</td>
<td>-The dissolving process</td>
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Skills  

<table>
<thead>
<tr>
<th>Math Skills/Science Processes</th>
<th>Assessments</th>
</tr>
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<tbody>
<tr>
<td>-Compare and contrast heterogeneous and homogeneous solutions</td>
<td>-Homework/Class work</td>
</tr>
<tr>
<td>-Describe water’s ability to be a solvent</td>
<td>-Quiz</td>
</tr>
<tr>
<td>-Utilize the molarity equation to model concentration of solutions</td>
<td>-Test</td>
</tr>
<tr>
<td>-Interpret the molarity equation to predict concentration</td>
<td>-Labs/activities</td>
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<tr>
<td>-Describe a saturated solution</td>
<td>-Performance Assessment</td>
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<td>-Identify types of solutions</td>
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Interventions / differentiated instruction  

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<thead>
<tr>
<th>Interdisciplinary Connections</th>
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<tr>
<td>- Mathematical connections</td>
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<tr>
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</table>
## Unit Title: Acids, Bases and Salts
### Course or Grade Level: Inquiry into the Sciences
### Length of Time: 7 days

### Essential Questions
- What are the properties of acids and bases
- How is pH related to hydronium and hydroxide ion concentrations
- What is a salt?
- What are some household products that contain: acids, bases & salts

### Content
- Acids
- Bases
- pH
- Acid-Base reactions
- Salts
- Cleaning Products
- Acids, Bases and salts in food

### Skills
- Differentiate between an acid and base
- Use the pH scale to predict if a liquid is an: acid or base
- List the characteristics of a salt
- Describe an acid base reaction
- Identify acids. Bases and salts in the home

### Math Skills/Science Processes
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- graph of graphs and charts

### Assessments
- Homework/Class work
- quiz
- test
- Labs/activities

### Interventions / differentiated instruction
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

### Interdisciplinary Connections
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

### Lesson resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

### 2009 NJCCCS
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.

21st Century Themes

| Global Awareness | Financial, Economic, Business, and Entrepreneurial Literacy | Civic Literacy | Health Literacy |

21st 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 |
|---------------------|-------------------|
| Unit Title: Nuclear Changes | Unit # 11 |
| Course or Grade Level: Inquiry into the Sciences | Length of Time: 14 days |
| Pacing |  |
| Essential Questions | - What is Radioactivity?  
- What happens when an isotope undergoes radioactive decay?  
- What holds the nuclei of an atom together?  
- What is released when the nuclei of a heavy element is released? |
| Content | - Nuclear radiation  
- Nuclear decay  
- Radioactive decay rates  
- Nuclear forces  
- Nuclear Fission and Fusion  
- Beneficial uses of Nuclear radiation  
- Risks of Nuclear radiation  
- Nuclear power |
| Skills | - List types of Radiation  
- Describe and debate risks and benefits of Nuclear radiation  
- List the steps of Nuclear Fission and Nuclear Fusion  
- Model Radioactive decay  
- Define Radioactive decay  
- Describe the process of Nuclear power |
| Math Skills/Science Processes | - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- graph of graphs and charts |
| Assessments | - Homework/Class work  
- Quiz  
- Test  
- Online activities |
| Interventions/differentiated instruction | - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |
| Inter-disciplinary Connections | - Mathematical connections  
- Connection to English  
- Science and society  
- Scientific discoveries and the link to Ethics |
| Lesson resources/Activities | - Hands-on activities  
- Laboratories related to the subject matter  
- Word processing systems  
- Computer access |
**2009 NJCCCS**

**Standard:** 5.3.12

**Strand(s):** E.3

**Content Statement(s):** Provide a scientific explanation for the Radiation on Earth using scientific evidence.

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

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</table>
| **Essential Questions** | - What is Motion?  
- What is the difference between speed and velocity?  
- What changes when an object accelerates?  
- What are the interactions between force and motion? |
| **Content** | - Observing Motion  
- Speed and Velocity  
- Calculating speed  
- Graphing motion, and acceleration  
- Fundamental forces  
- Balanced and unbalanced forces  
- The force of friction  
- Friction and motion |
| **Skills** | - Define motion, speed, velocity and acceleration.  
- Provide examples of motion, speed, velocity and acceleration  
- Define and model motion, speed, velocity and acceleration  
- Provide and explain examples of friction  
- Recognize that motion, speed, velocity and acceleration are all related forces |
| **Math Skills/Science Processes** | - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- Graph of graphs and charts |
| **Assessments** | - Homework/Class work  
- Quiz  
- Test  
- Laboratories  
- Benchmark #3 |
| **Interventions/differentiated instruction** | - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |
| **Interdisciplinary Connections** | - Mathematical connections  
- Connection to English  
- Science and society  
- Scientific discoveries and the link to Ethics |
| **Lesson resources/Activities** | - Hands-on activities  
- Laboratories related to the subject matter  
- Word processing systems  
- Computer access |

**2009 NJCCCS**

**Standard:** 5.3.12
Strand(s): E.1

Content Statement(s): Account for the appearance of a novel trait that arose in a given population.

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<tr>
<td>--------------</td>
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</tr>
</tbody>
</table>
| Essential Questions | - What is Gravity?  
|               | - What makes an object speed-up, slow-down or change direction?  
|               | - How are mass and weight measured?  
|               | - Why do fall to the ground when dropped?  
|               | - How do you calculate the momentum of an object?  
| Content      |  
|              | - Newton’s first and second laws  
|              | - Weight and Mass  
|              | - Law of universal gravitation  
|              | - Free fall  
|              | - Projectile motion  
|              | - Action and Reaction  
|              | - Momentum  
|              | - Conservation of Momentum  
| Skills       |  
|              | - Describe Newton’s first and second law of motion  
|              | - Compare and contrast weight and mass  
|              | - Utilize the Law of universal gravitation  
|              | - Explain Free fall  
|              | - Perform the momentum equations to solve for momentum  
|              | - Interpret the Law of Momentum  
| Math Skills/ Science Processes |  
|              | - Use of graphs  
|              | - Creation and usage of data tables  
|              | - Use of Graphing Calculators  
|              | - graph of graphs and charts  
| Assessments  |  
|              | - Homework/ Class work  
|              | - Quiz  
|              | - Test  
|              | - Labs/activities  
|              | - Online activities  
|              | - Performance Assessment  
| Interventions/ differentiated instruction |  
|              | - Provide advanced notice of tests  
|              | - Include hands-on activities  
|              | - Provide material at student’s level of functioning  
|              | - Use multi sensory approach  
| Interdisciplinary Connections |  
|              | - Mathematical connections  
|              | - Connection to English  
|              | - Science and society  
|              | - Scientific discoveries and the link to Ethics  
| Lesson resources/ Activities |  
|              | - Hands-on activities  
|              | - Laboratories related to the subject matter  
|              | - Word processing systems  
|              | - Computer access  

Pine Hill Public Schools  
Science Curriculum  

Unit Title: Forces  
Course or Grade Level: Inquiry into the Sciences  
Length of Time: 18 days  
Unit # 13
### 2009 NJCCCS

**Standard:** 5.3.12  
**Strand(s):** C.1  

**Content Statement(s):** Analyze the interrelationships and interdependencies the forces on Earth  

<table>
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## Pine Hill Public Schools
### Science Curriculum

<table>
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<tr>
<th>Unit Title: Work and Energy</th>
<th>Unit # 14</th>
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<td>Course or Grade Level: Inquiry into the Sciences</td>
<td>Length of Time: 1 week</td>
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</tbody>
</table>

### Pacing

**Essential Questions**
- How is work calculated?
- What is the relationship between work and power?
- What are the six types of simple machine?
- What is energy?
- How does energy change?
- What is the Law of Conservation of Energy?

### Content

- Power
- Machines and Mechanical advantage
- The six simple machines
- Types of energy
- Energy transformations
- Law of Conservation of Energy
- Efficiency of machines

### Skills

- Describe how work and power are related
- List the six types of simple machines
- Compare and contrast potential and kinetic energy
- Describe the main types of energy
- Interpret the Law of conservation of Energy
- Describe Machines and Mechanical advantage

### Math Skills/Science Processes

- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- graph of graphs and charts

### Assessments

- Benchmark
- Practice performance assessment

### Interventions / differentiated instruction

- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

### Interdisciplinary Connections

- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

### Lesson resources / Activities

- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

**2009 NJCCCS**
### Pine Hill Public Schools
### Science Curriculum

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# Pine Hill Public Schools Science Curriculum

## Unit Title: Heat and Temperature

### Unit # 15

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### Pacing

#### Essential Questions
- What does temperature have to do with energy?
- What three temperature scales are used?
- How does energy transfer happen?
- What is a conductor and an insulator?
- What happens to heat energy when it is transferred?

### Content
- Temperature and Energy
- Temperature scales
- Relating temperature to energy scales
- Methods of energy transfer
- Conductors and Insulators
- Specific heat
- Laws of Thermodynamics
- Heat Engines

### Skills
- Perform experiments using Conductors and Insulators
- Relate temperature and energy
- Define the Laws of Thermodynamics
- Define Specific heat
- Describe methods of energy transfer
- Describe Specific heat

### Math Skills/Science Processes
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

### Assessments
- Homework/class work
- Lab safety quiz
- Performance during lab experiments

### Interventions / differentiated instruction
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi-sensory approach

### Interdisciplinary Connections
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

### Lesson resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access
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<td>Unit Title:</td>
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| Essential Questions | - What does a wave carry?  
- How are waves generated?  
- What are the ways to measure and compare waves?  
- How do waves behave when they hit a boundary, when they pass around an edge or opening, and when they pass from one medium to another? |
| Content | - Waves  
- Vibrations and waves  
- Transverse and longitudinal waves  
- Surface waves  
- Wave properties  
- Reflection, Diffraction and Refraction  
- Interface  
- Standing waves |
| Skills | - Define a wave  
- Describe the Doppler Effect  
- Perform frequency and wave-length equations  
- Compare Transverse and longitudinal waves  
- Compare Reflection, Diffraction and Refraction  
- Interpret the interactions of various waves |
| Math Skills/Science Processes | - Use of graphs  
- Creation and usage of data tables  
- Use of Graphing Calculators  
- graph of graphs and charts  
Determine the meaning of a term based on its root words  
- Design and perform experiments using the scientific method |
| Assessments | -- homework/class work  
- quiz  
- test  
- Inquiry lab on scientific method |
| Interventions /differentiated instruction | - Provide advanced notice of tests  
- Include hands-on activities  
- Provide material at student’s level of functioning  
- Use multi sensory approach |
| Inter-disciplinary Connections | - Mathematical connections  
- Connection to English  
- Science and society  
- Scientific discoveries and the link to Ethics |
| Lesson resources /Activities | - Hands-on activities  
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- Word processing systems  
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# Sound and Light

## Course or Grade Level: Inquiry into the Sciences

### Length of Time: 1 week

### Unit Title: Sound and Light

### Unit # 17

## Pacing

### Essential Questions
- What are the characteristics of sound?
- How do ears help humans hear sound waves?
- How do scientific models describe light?
- What is the Electromagnetic spectrum?
- Why do we see colors?

## Content
- Properties of sound
- Hearing and the ear
- Ultrasound and Sonar
- Waves and Particles
- The Electromagnetic spectrum
- Reflection of Light
- Seeing colors
- Refraction of light
- Lenses

## Skills
- Describe the properties of sound
- Describe the properties of light
- Interpret the Electromagnetic spectrum
- List the properties of waves and Particles
- Describe the refraction of light
- List the functions of Lenses

## Math Skills/Science Processes
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

## Assessments
- homework/class work
- quiz
- test
- Laboratories

## Interventions / Differentiated Instruction
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

## Interdisciplinary Connections
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics

## Lesson Resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

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<tr>
<th>21st Century Skills</th>
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<tbody>
<tr>
<td>Creativity and Innovation</td>
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<tr>
<td>Media Literacy</td>
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| Pine Hill Public Schools  
| Science Curriculum |
|---------------------|---------------------|
| **Unit Title:** Electricity and Magnetism | **Unit # 18** |
| **Course or Grade Level:** Inquiry into the Sciences | **Length of Time:** 3 weeks |

**Pacing**

**Essential Questions**
- What are the different kinds of electrical charge?
- How are electrical potential energy and gravitational potential energy similar?
- What is Voltage and Current?
- What is magnetism?
- How is Earth’s magnetic field oriented?
- How are magnetism and electrical currents related?

**Content**
- Electric charge and force
- Voltage and Current
- Electrical energy and Electric power
- Types of electrical circuits
- Fuses and circuit breakers
- Magnets and magnetic fields
- Electromagnetism
- Types of electrical circuits
- Transformers

**Skills**
- Relate Electric charge and force
- Describe Voltage and Current
- List Types of electrical circuits
- Describe Types of electrical circuits
- Interpret Types of electrical circuits
- Describe magnets and magnetic fields
- List the principles of Electromagnetism
- Describe the types of electrical circuits
- List the function of a transformer

**Math Skills/Science Processes**
- Use of graphs
- Creation and usage of data tables
- Use of Graphing Calculators
- Graph of graphs and charts

**Assessments**
- homework/class work
- quiz
- test
- Laboratories

**Interventions / differentiating instruction**
- Provide advanced notice of tests
- Include hands-on activities
- Provide material at student’s level of functioning
- Use multi sensory approach

**Interdisciplinary Connections**
- Mathematical connections
- Connection to English
- Science and society
- Scientific discoveries and the link to Ethics
Lesson resources / Activities
- Hands-on activities
- Laboratories related to the subject matter
- Word processing systems
- Computer access

2009 NJCCCS

Standard:

Strand(s):

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<th>Content Statement(s):</th>
<th>CPI # / CPI(s):</th>
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21st Century Themes

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

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<th>Critical Thinking and Problem Solving</th>
<th>Communication and Collaboration</th>
<th>Information Literacy</th>
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<tr>
<td>Media Literacy</td>
<td>ICT Literacy</td>
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<td>Life and Career Skills</td>
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