

<b>Grade, Subject/Course:</b> 9th Grade - General Science/Honors		<b>Unit:</b> Molecular Chemistry	<input checked="" type="checkbox"/> Essential <input checked="" type="checkbox"/> Important <input type="checkbox"/> Compact
<b>Big Idea:</b> Matter & how substances react with each other.		<b>Phenomena:</b> <ul style="list-style-type: none"> <li>Chemicals react with each other based on chemical and physical properties</li> <li>Why do water and oil NOT interact?  (Polarity, solubility, flammability, etc)</li> </ul>	
<b>PA Core Content Standards/Anchors (or National Standards):</b> 3.3.9-12.A 3.3.9-12.B		<b>Interdisciplinary Standards (if applicable):</b>	
<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>What is an atom and how does its structure help scientists understand its atomic properties?</li> <li>What are Elements &amp; Compounds?</li> <li>How do atoms bond to one another?</li> <li>What kind of properties do Ionic and Covalent Compounds have?</li> <li>How does soap work?</li> </ul>		<b>Understandings:</b> <ul style="list-style-type: none"> <li>Atoms have a sub-atomic particles that contribute to mass of substances</li> <li>Atoms can have varying -subatomic particles that can create ions &amp; isotopes</li> <li>Atoms share and transfer electrons in order to stabilize themselves to create compounds.</li> </ul>	
<b>Knowledge:</b> <ul style="list-style-type: none"> <li>Atomic Structure</li> <li>Ionic Bonding</li> <li>Covalent Bonding</li> <li>Properties of Ionic vs Covalent</li> <li>Polarity</li> </ul>		<b>Do/Skills:</b> <ul style="list-style-type: none"> <li>Ionic vs. Covalent Properties (Lab/Activity)</li> <li>Atomic Structure (Lab/Activity)</li> <li>Draw/describe differences between Ionic and Covalent molecules</li> </ul>	
<b>Vocabulary:</b> <ul style="list-style-type: none"> <li>Atomic Structure</li> <li>Proton, neutron, electron</li> <li>Nucleus</li> <li>Valence</li> <li>Atom</li> <li>Molecule</li> </ul>	<ul style="list-style-type: none"> <li>Ionic</li> <li>Covalent</li> <li>Electronegativity</li> <li>Lewis structure</li> <li>Atomic number</li> <li>Atomic mass</li> <li>Ion</li> </ul>	<b>Core Resources:</b> Student unit outlines and provided notes  Lab activities  Lab Supplies	
<ul style="list-style-type: none"> <li><b>Common Assessment(s):</b> →Assessments will be 75% common in content but may be asked in various ways Quizzes Unit Test Lab activities</li> </ul>		<ul style="list-style-type: none"> <li><b>Supplemental Resources:</b> <ul style="list-style-type: none"> <li>Approved video examples</li> <li>Lab materials</li> <li>Approved online resources</li> </ul> </li> </ul>	

<b>Grade, Subject/Course:</b> 9th Grade - General Science/Honors		<b>Estimated # Days:</b> 15 -18 class days	
<b>Unit:</b> Chemistry in the Earth		<input checked="" type="checkbox"/> Essential <input checked="" type="checkbox"/> Important <input type="checkbox"/> Compact	
<b>Big Idea:</b> pH in water and soil is affected by various Earth cycles.		<b>Phenomena:</b> <ul style="list-style-type: none"> <li>Soil - how it looks different between different areas</li> <li>Water and soil contamination - specifically w/ phosphorus, nitrogen, and carbon</li> </ul>	

		<ul style="list-style-type: none"> <li>pH changing with varying phosphorus, nitrogen, and carbon</li> </ul>
<b>PA Core Content Standards/Anchors (or National Standards):</b> <b>3.3.9-12.E 3.3.9-12.K 3.3.9-12L</b>		<b>Interdisciplinary Standards (if applicable):</b>
<b>Essential Questions:</b> What is pH and how does it change in the soil differently than in water?  What is the Nitrogen cycle and how does it affect... What is the Carbon Cycle and .... What is the Phosphorus Cycle and...		<b>Understandings:</b> <ul style="list-style-type: none"> <li>Students will know that...           <ul style="list-style-type: none"> <li>Nitrogen, Carbon, and Phosphorus are important components of a healthy ecosystem</li> <li>The causes of increased and decreased pH in water and soil</li> <li>The process for identifying soils</li> </ul> </li> </ul>
<b>Knowledge:</b>  Steps nitrogen, carbon, and phosphorus cycle Soil formation processes Soil types. Sources of water and soil contamination		<b>Do/Skills:</b> <ul style="list-style-type: none"> <li>Soil &amp; water pH testing &amp; analysis</li> <li>Soil formation - let it sit for the rest of marking period</li> <li>Soil investigation activity</li> </ul>
<b>Vocabulary:</b> Carbon Carbon Cycle Nitrogen Nitrogen Cycle	pH Phosphorus Phosphorus Cycle Soil Water	<b>Core Resources:</b>  Student unit outlines and provided notes  Lab activities  Lab Supplies
<b>Common Assessment(s):</b> <i>→Assessments will be 75% common in content but may be asked in various ways</i> <ul style="list-style-type: none"> <li>Quiz</li> <li>Test</li> <li>pH Lab</li> <li>Soil investigation Lab</li> </ul>		<b>Supplemental Resources:</b>  Approved video examples  Approved online resources

<b>Grade, Subject/Course: 9th Grade - General Science/Honors</b>	
<b>Unit:</b> Rock Cycle	<input checked="" type="checkbox"/> Essential <input checked="" type="checkbox"/> Important <input type="checkbox"/> Compact
<b>Big Idea:</b>  Where do Rocks come from? ... Are Rocks and minerals the same thing?	<b>Phenomena:</b> <ul style="list-style-type: none"> <li>Naturally observing rocks out in the world. What types of rocks exist and how do they form?</li> <li>A rock is a combination of one or more minerals.</li> <li>The earth is old and its age can be determined by the processes of the rock cycle</li> </ul>
<b>PA Core Content Standards/Anchors (or National Standards):</b> <b>3.3.9-12.F 3.3.9-12. I 3.3.9-12.H 3.3.9-12.J</b>	
<b>Interdisciplinary Standards (if applicable):</b>	

<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>Rock and Mineral Formation and Identification</li> <li>Plate Tectonics/ Earthquakes/ Volcanoes/ Landforms</li> <li>Earth History</li> </ul>			<b>Understandings:</b> <ul style="list-style-type: none"> <li>Earth's internal heat drives the rock cycle</li> <li>The cycle is the continuous recycling of earth materials</li> <li>The cycle encompasses every geologic concept</li> <li>The rock cycle is a function of plate tectonics</li> <li>Process of classification for rock and mineral identification</li> <li>Rules that dictate absolute and relative dating concept</li> </ul>
<b>Knowledge: (Students should know)</b> <ul style="list-style-type: none"> <li>The rock cycle is driven by heat from the Earth's core</li> <li>Processes by which each rock type are formed</li> <li>Weather and Erosion supplement the process in rock type formation</li> <li>Tectonic Theory is supported by the location of earth features and volcanic/earthquake activity</li> </ul>			<b>Do/Skills:</b> <ul style="list-style-type: none"> <li>Devise a classification system for mineral and rock identification</li> <li>Utilize the current classification system to identify rocks and minerals</li> <li>Chronological sequence geologic events</li> <li>Explain the processes controlling landform formation</li> </ul>
<b>Vocabulary:</b> Classification Earthquakes Epicenter Focus Form (formation) Identify (identification) Landform Mineral Hardness Streak Fossil Unconformity	Clastic Metamorphic Foliated Non-foliated Plate tectonics Rock Volcano Magma Lava Hotspot Convergent Divergent Transform	Metallic Nonmetallic Luster Igneous, Mafic Felsic Aphanitic Phaneritic Vesicular Sedimentary Absolute Date Uplift Relative Date	<b>Core Resources:</b>  Student unit outlines and provided notes  Lab activities  Lab supplies
<b>Common Assessment(s):</b> →Assessments will be 75% common in content but may be asked in various ways <ul style="list-style-type: none"> <li>Rock Cycle Poster</li> <li>Earthquake/Tsunami related PSA</li> <li>Rock Cycle &amp; Plate Tectonics Quiz</li> <li>Unit Test</li> </ul>			<b>Supplemental Resources:</b>  Approved video examples  Approved online resources

<b>Grade, Subject/Course:</b> 9th Grade - General Science/Honors Estimated # Days: 15 -18 class days	
<b>Unit:</b> Biomes	<u> X </u> Essential <u> X </u> Important <u>   </u> Compact
<b>Big Idea:</b> "How do life and Earth's systems co-evolve?"	<b>Phenomena:</b>  How different ecosystems adapt in order to survive & thrive  Foodchains/webs are complex systems in a ecosystem
<b>PA Core Content Standards/Anchors (or National Standards):</b> <b>3.3.9-12.L</b>	<b>Interdisciplinary Standards (if applicable):</b>
<b>Essential Questions:</b> What is Ecology and how do its levels of organization help us understand the characteristics of living things?  Resources of Biosphere (Solar, Wind, Hydro, Geo)	<b>Understandings:</b> <ul style="list-style-type: none"> <li>Students will know that... <ul style="list-style-type: none"> <li>Order of ecosystems are driven by the species of plants and animals that live there</li> <li>Climate effects on an ecosystem can vary</li> <li>Woodchains and Foodwebs show various</li> </ul> </li> </ul>

Ecosystems	relationships between species how predation and overpopulation can lead to collapse
Food chains/webs	
<b>Knowledge:</b> <ul style="list-style-type: none"> <li>How are living organisms organized and categorized?</li> <li>Energy sources</li> <li>How animals and plants fit into ecosystems alongside many other species</li> </ul>	<b>Do/Skills:</b> <ul style="list-style-type: none"> <li>Biome research project</li> <li>Types of energy forms lab</li> </ul>
<b>Vocabulary:</b> Biosphere Characteristics Ecology Geothermal power Humidity Hydroelectric power Living things	Organization Renewable resources Resources Soil Solar power Temperature Turbine Wind power
	<b>Core Resources:</b> Student unit outlines and provided notes Lab activities Lab Supplies
<b>Common Assessment(s):</b> →Assessments will be 75% common in content but may be asked in various ways <ul style="list-style-type: none"> <li>Quiz</li> <li>Test</li> <li>Biome research project</li> </ul>	<b>Supplemental Resources:</b> Approved video examples Approved online resources

<b>Grade, Subject/Course: 9th Grade - General Science/Honors</b>	
<b>Unit:</b> Water Cycle	<u> X </u> Essential <u> X </u> Important <u> ___ </u> Compact
<b>Big Idea:</b> The water cycle controls all hydrologic processes on the planet.	<b>Phenomena:</b> <ul style="list-style-type: none"> <li>Seeing the properties of water in lab or real world setting</li> <li>Watersheds</li> </ul>
<b>PA Core Content Standards/Anchors (or National Standards):</b> <b>3.3.9-12.K</b>	<b>Interdisciplinary Standards (if applicable):</b>
<b>Essential Questions:</b> Streamflow/ Drainage Basins Water behaviors and properties (polarity) Necessity of Water	<b>Understandings:</b> <ul style="list-style-type: none"> <li>Water cycle is continuous</li> <li>Water movement driven by heat</li> <li>Water necessary for life</li> <li>Water's role in topographic formation/rock cycle</li> </ul>
<b>Knowledge:</b> <ul style="list-style-type: none"> <li>How water flows and moves in its different states</li> <li>Properties of water - polarity, density, cohesion, etc.</li> <li>Explain how the properties of water help make water as important as it is</li> </ul>	<b>Do/Skills:</b> <ul style="list-style-type: none"> <li>Lancaster Watershed Project (Lab/Activity)</li> <li>Water Properties Lab (Lab/Activity)</li> <li>Water Cycle Illustration (Lab/Activity)</li> <li>Water purification (Lab/Activity)</li> </ul>

**Vocabulary:**

Adhesion  
 Capillary action  
 Surface tension  
 Stream  
 Drainage basin / watershed  
 Turbidity  
 Dissolved oxygen  
 Solute

Solvent  
 Water cycle  
 Condensation  
 Evaporation  
 Precipitation  
 Infiltration  
 Groundwater  
 Polarity  
 Cohesion

**Core Resources:**

Student unit outlines and provided notes  
 Lab activities  
 Lab Supplies

**Common Assessment(s):**

→Assessments will be 75% common in content but may be asked in various ways  
 -Unit Quiz  
 -Unit Test  
 -Water Cycle Poster

**Supplemental Resources:**

Approved video examples  
 Approved online resources

**Grade, Subject/Course:** 9th Grade - General Science/Honors Estimated # Days: 15 -18 class days

**Unit:** Weather/Meteorology

X  Essential  X  Important  \_  Compact

**Big Idea:** How do weather formations occur?  
 How do temperatures and air pressures impact weather fronts?  
 How does a meteorologist report various weather information at a location at one time?  
 What air masses lead to weather events in the US?

**Phenomena:** Sudden snow storms, tornados and how they form, Nor'easter weather events and what causes those, Understanding weather maps on television or online., cloud formation types and conditions related to them.

**PA Core Content Standards/Anchors (or National Standards):**

<b>3.3.9-12E</b>	<b>3.3.5B</b>
<b>3.3.9-12L</b>	<b>3.3.6-8J</b>
<b>3.3.9-12M</b>	<b>3.3.6-8O</b>
<b>3.3.9-12S</b>	

**Interdisciplinary Standards (if applicable):**

**Essential Questions:**

How does uneven heating of the earth's surface influence weather patterns and climate?

- How do solar radiation variations and different factors on earth's surface affect atmospheric heat?
- How do differences in heat and atmospheric moisture influence air pressure and weather system movement?
- How does water enter and leave the atmosphere? What effect does differences in atmospheric water have on long-term weather patterns?
- Is weathering and erosion the same thing?
- How does temperature and pressure affect cold and warm fronts?
- How do Global winds lead to specific weather events?

**Understandings:**

- Students will know that...
  - Winds are created by changes in air temps due to uneven heating of Earth's surface
  - Warm, Cold, Stationary & Occluded fronts are types of weather events that dictate weather patterns around the world.
  - Using weather station model information to determine Dewpoint and Relative humidity
  - Dewpoint and Air temp differences affect overall air saturation.
  - Air masses & Jet Streams exist as result of latitude and longitude locations on the Earth's Surface
  - Become familiar with the various weather instruments responsible for reporting weather data.

<p><b><u>Knowledge:</u></b></p> <p>Difference between weather and climate.  Heat from sun causes all weather  Different surfaces heat at different rates  Difference in heat and humidity causes differences in pressure  Water constantly enters and leaves the atmosphere</p>		<p><b><u>Do/Skills:</u></b></p> <ul style="list-style-type: none"> <li>• Dewpoint and relative humidity sling psychrometer</li> <li>• Barometer reading</li> <li>• Can crush lab</li> </ul>
<p><b><u>Vocabulary:</u></b></p> <p>Energy  Environment  Land  Usage  Heat  Temperature  Pressure  Solar radiation</p>	<p>Barometric Pressure  Cyclone  Anticyclone  Climate  Desertification  Arctic, Polar and Tropical  Maritime  Continental  Humidity</p>	<p><b><u>Core Resources:</u></b></p> <p>Lab activities, provided notes, lab supplies and student outlined content</p>
<p><b><u>Common Assessment(s):</u></b></p> <p>→Assessments will be 75% common in content but may be asked in various ways</p> <ul style="list-style-type: none"> <li>• Quiz</li> <li>• Test</li> <li>• Lab activities (can crush, dewpoint and relative humidity reading)</li> </ul>		<p><b><u>Supplemental Resources:</u></b></p> <p>Approved video examples</p> <p>Approved online resources</p>