

Science 9

1st Semester Priorities	2nd Semester Priorities
<p>HS-PS2-1: Forces &amp; Motion</p> <ul style="list-style-type: none"> <li>Collect, graph, &amp; analyze data to show the relationship between mass and acceleration when force is applied. Use <math>F = ma</math></li> </ul>	<p>HS-ESS1-5: Plate Tectonics</p> <ul style="list-style-type: none"> <li>Use plate tectonics to help explain the ages of ocean crust and continental crust rocks.</li> </ul>
<p>HS-PS2-3: Forces &amp; Motion</p> <ul style="list-style-type: none"> <li>Design a device that minimizes the force on an object during a collision.</li> </ul>	<p>HS-ESS2-1: Plate Tectonics</p> <ul style="list-style-type: none"> <li>Develop a model to show how Earth's processes create continental and ocean-floor features such as mountains, valleys, trenches, and ridges.</li> </ul>
<p>HS-PS3-1: Energy</p> <ul style="list-style-type: none"> <li>Describe how energy cannot be created or destroyed but it can change forms.</li> </ul>	<p>HS-ESS2-4: Earth Systems</p> <ul style="list-style-type: none"> <li>Use a model to show how changes in Earth's systems can create changes in climate.</li> </ul>
<p>HS-PS3-3: Energy</p> <ul style="list-style-type: none"> <li>Model energy being converted from one form to another. (Ex. gravitational potential energy to kinetic energy)</li> </ul>	<p>HS-ESS2-6: Model of the Carbon Cycle</p> <ul style="list-style-type: none"> <li>Develop a model to show how carbon cycles between the hydrosphere, atmosphere, geosphere, and biosphere.</li> </ul>
<p>HS-PS2-5: Electricity &amp; Magnetism</p> <ul style="list-style-type: none"> <li>Create simple series and parallel circuits.</li> <li>Investigate how an electric current can create a magnetic field and a magnetic field can create an electric current.</li> </ul>	<p>HS-ESS3-1: Natural Resources</p> <ul style="list-style-type: none"> <li>Describe how the availability of natural resources has been impacted by human activity.</li> <li>Evaluate solutions for managing natural resources.</li> </ul>
<p>HS-PS1-1 Element Project</p> <ul style="list-style-type: none"> <li>Understand how atoms are made of protons, neutrons, and electrons, and how these particles are arranged in the atom.</li> <li>Observe the patterns of the periodic table.</li> </ul>	<p>HS-ESS3-4: Human Impacts</p> <ul style="list-style-type: none"> <li>Create and evaluate a solution that reduces human impact on natural systems.</li> </ul>
<p>HS-ESS1-3: Stars</p> <ul style="list-style-type: none"> <li>Describe how stars create energy through nuclear fusion.</li> <li>Communicate how stars produce different elements on the periodic table.</li> </ul>	<p>HS-PS3-5: Climate Change</p> <ul style="list-style-type: none"> <li>Analyze data to create an evidence-based prediction of future global climate change and its impacts.</li> </ul>

Biology

1st Semester Priorities

**LS1-3** Feedback Mechanisms Maintain Homeostasis  
**LS1-2** Cell Structure and Organization  
**LS1-6** Biochemistry and Biomolecules  
**LS1-7** Biochemistry and Cellular Energy  
**LS2-4** Energy Flow in Ecosystems

2nd Semester Priorities

**LS2-7** Changing Climates and Ecosystems  
**LS2-1** Population Dynamics  
**LS3-1** Role of DNA and Chromosomes  
**LS1-1** Structure of DNA and Proteins  
**LS4-4** Evidence for Natural Selection

Students will:

- Plan and conduct an experiment that demonstrates homeostasis of the human cardiovascular system.
- Create a flowchart that describes and explains the levels of organization of a human organ system and how systems interact.
- Develop a model that illustrates and explains how organisms rearrange atoms to build biomolecules.
- Develop a model that illustrates and explains how organisms break down food molecules to generate energy.
- Analyze a food web and create a diagram of an energy pyramid that identifies trophic levels and calculates energy flow in an ecosystem.

Students will:

- Analyze evidence on the impact of climate change on the sea turtle population and design a solution.
- Develop and analyze a graph of human population growth and use the graph to identify factors that limit growth and predict a carrying capacity.
- Develop a model that illustrates and explains the role of chromosomes in the inheritance of traits.
- Analyze and interpret sickle cell anemia to describe how the structure of DNA determines the structure and function of proteins and cells.
- Simulate how the overuse of antibiotics can cause a population of bacteria to adapt and evolve into a drug resistant colony.

Chemistry	
1st Semester Priorities	2nd Semester Priorities
<p>HS-PS1-1: Atoms &amp; The Periodic Table</p> <ul style="list-style-type: none"> <li>Understand how atoms are made of protons, neutrons, and electrons, and how these particles are arranged in the atom.</li> <li>Learn about how atoms bond together to form molecules through ionic, covalent, and metallic bonds.</li> </ul>	<p>HS-PS1-5: Reaction Rates</p> <ul style="list-style-type: none"> <li>Explain how changing the temperature or amount of reactants affects how quickly a reaction can happen</li> </ul>
<p>HS-PS1-2: Chemical Reactions</p> <ul style="list-style-type: none"> <li>Explore how substances interact and change to form new substances in chemical reactions.</li> </ul>	<p>HS-PS1-6: Equilibrium</p> <ul style="list-style-type: none"> <li>Learn about equilibrium in chemical reactions and how it relates to the forward and reverse reactions reaching a balance.</li> </ul>
<p>HS PS1-4: Energy of Chemical Reactions</p> <ul style="list-style-type: none"> <li>Model how the energy released or absorbed in a chemical reaction depends on the total energy stored in the bonds of the substances involved.</li> </ul>	<p>HS-PS1-7: Conservation of Mass</p> <ul style="list-style-type: none"> <li>Balance chemical reactions.</li> <li>Describe atoms, moles, and molar mass of components of a chemical reaction.</li> <li>Use math to show that mass is unchanged in a chemical reaction.</li> </ul>
<p>HS-PS1-8: Nuclear Chemistry</p> <ul style="list-style-type: none"> <li>Understand the structure of the nucleus, types of nuclear decay, and applications of nuclear chemistry, such as nuclear energy and radioactive dating.</li> </ul>	<p>HS-PS2-6: Molecular Structure</p> <ul style="list-style-type: none"> <li>Communicate why molecular structure is important in the use of everyday materials.</li> </ul>
	<p>HSPS 3-4: Thermodynamics</p> <ul style="list-style-type: none"> <li>Plan and carry out an investigation to show that when two components with different temperatures are mixed together, the heat spreads out evenly between them.</li> </ul>

Physics

1st Semester Priorities	2nd Semester Priorities
<p>HS-PS2-1: Forces &amp; Motion</p> <ul style="list-style-type: none"> <li>Analyze data that supports the claim of Newton's second law of motion.</li> <li>Use <math>F = ma</math></li> </ul>	<p>HS-PS2-4: Gravity &amp; Electricity</p> <ul style="list-style-type: none"> <li>Predict how objects are pulled together by gravity or pushed apart by electric charges.</li> <li>Use <math>F_g = -G \frac{m_1 m_2}{d^2}</math></li> <li><math>F_e = k \frac{q_1 q_2}{d^2}</math></li> </ul>
<p>HS-PS2-2: Forces &amp; Motion</p> <ul style="list-style-type: none"> <li>Use math to support the claim that total momentum of a system is conserved.</li> <li>Use <math>p = mv</math></li> </ul>	<p>HS-PS2-5: Electricity &amp; Magnetism</p> <ul style="list-style-type: none"> <li>Investigate how an electric current can create a magnetic field and a magnetic field can create an electric current.</li> </ul>
<p>HS-PS2-3: Forces &amp; Motion</p> <ul style="list-style-type: none"> <li>Design, evaluate, and improve a device that minimizes the force on an object during a collision.</li> <li>Use <math>F\Delta t = m\Delta v</math></li> </ul>	<p>HS-PS3-5: Electricity &amp; Magnetism</p> <ul style="list-style-type: none"> <li>Create a model to show how two objects can affect each other with electricity or magnets, to observe how they push or pull on each other.</li> </ul>
<p>HS-PS3-1: Energy</p> <ul style="list-style-type: none"> <li>Calculate the change in energy of a system when inputs and outputs are known.</li> <li>Use <math>PE = mgh</math></li> <li>Use <math>KE = \frac{1}{2}mv^2</math></li> </ul>	<p>HS-PS4-1: Waves</p> <ul style="list-style-type: none"> <li>Use math to show the relationship between frequency, wavelength, and speed of waves traveling through different mediums.</li> <li>Use <math>v = f\lambda</math></li> </ul>
<p>HS PS3-3: Energy</p> <ul style="list-style-type: none"> <li>Design, evaluate, and improve a device that converts one form of energy to another form of energy.</li> </ul>	<p>HS-PS4-2: Waves</p> <ul style="list-style-type: none"> <li>Evaluate information that displays electromagnetic radiation as a wave model or as a particle model.</li> </ul>

Environmental Science

1st Semester Priorities

**LS2-7** Solutions for reducing human impact on the environment and biodiversity

**SEP 1/3/4** Asking questions and defining problems, planning and carrying out investigations, and analyzing and interpreting data

**SEP 6/7/8** Constructing explanations for science and designing solutions

2nd Semester Priorities

**LS2-7** Solutions for reducing human impact on the environment and biodiversity

**SEP 1/3/4** Asking questions and defining problems, planning and carrying out investigations, and analyzing and interpreting data

**SEP 6/7/8** Constructing explanations for science and designing solutions

Students will:

- Research and present information on a specific topic in the history of the environmental science movement.
- Write evidence-based arguments following the Claims/Evidence/Reasoning format that feature a variety of topics covered throughout class.
- Research and design a cartoon that features how a carbon atom moves through hydrosphere, lithosphere, biosphere, and atmosphere in a continuous cycle, and use it to explain how human activities impact the carbon cycle.
- Research and design a poster that explains information on how human impact on a changing climate affects ecosystems such as the coral reef ecosystem.

Students will

- Write evidence-based arguments following the Claims/Evidence/Reasoning format that feature a variety of topics covered throughout class.
- Research and evaluate information to design a poster that presents how human waste can accumulate into the Great Pacific Garbage Patches, and how human innovation is working to stop the waste at the source and clean up the garbage patches.
- Analyze and evaluate how climate change is affecting agricultural growing zones and design a GMO crop that can withstand the changes.
- Research and present information on how urbanization impacts ecosystems and temperature, and design a plan for attaining Tree Campus Certification that addresses urban needs.

Genetics - 1 semester

1st Semester Priorities

**SEP 2** Developing and Using Models

**SEP 1/3/4** Asking questions and defining problems, planning and carrying out investigations, and analyzing and interpreting data

**SEP 6/7/8** Constructing explanations for science and designing solutions

2nd Semester Priorities

**This is a one semester course, so the priorities will be the same as what is listed in semester one.**

Students will:

- Develop models and construct explanations for the structure and function of DNA, proteins, and stem cells in the human body.
- Ask questions, carry out investigations, and analyze data about the relationship between DNA, chromosomes, and inherited traits.
- Research and present information on a human illness caused by a genetic disorder.

Students will