



Ut Title	Established Goals	Standards	Enduring Understanding Essential Questions	Evidence and Assessment
Ecology	System Interactions	<p>HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</p> <p>HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.</p> <p>HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.</p> <p>HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.</p> <p>HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.</p>	<p>How does the environment form a system?</p> <p>What are the Matter cycles?</p> <p>How is Taxonomy based on the tree of life?</p>	<p>Test Ecological systems of NM Lab &amp; Project</p>
Evolution	Change	<p>HS.Natural Selection and Evolution – All standards</p> <p>AND:</p> <p>HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and</p>	<p>How do organisms change? (Long scale)</p>	<p>Test Evolutionary change Project Evolution and survival of the</p>

		<p>maintaining complex organisms.</p> <p>HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.</p>	<p>What are the lines of evidence for evolution</p> <p>What are the types of evolution</p> <p>How has life historically evolved?</p>	<p>fittest in technology Project.</p>
Cells	Form and Function	<p>HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.</p> <p>HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.</p> <p>HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.</p> <p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.</p>	<p>How does form determine function and vice versa in the micro scale?</p> <p>What is the purpose of osmosis?</p>	<p>Test Cell model project</p> <p>Osmosis Lab</p>
Human Body System	Form and Function	<p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.</p> <p>HS-LS1-2. Develop and use a model to illustrate the</p>	<p>How does form of organ and tissue determine function and</p>	<p>Test Virus Anime Project</p> <p>Health Project</p>

		hierarchical organization of interacting systems that provide specific functions within multicellular organisms. HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	<p>vice versa in the macro scale?</p> <p>How are human like giant cells?</p> <p>What is healthy and what is needed to be healthy?</p>	

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Forms and Math	Understand the Basics of Chemistry and Foundational Math	<p>S.Structure and Properties of Matter</p> <p>HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.</p> <p>HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.</p> <p>HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.</p>	Understanding of microscopic scientific thinking. What are the basic forms and interactions in chemicals and what math is associated?	Test and quizzes Matter Lab PT Identification of Trends
Reactions and Math	Understand Bonds and Equations with Stoichiometric Math	HS.Chemical Reactions	How do we apply conceptual knowledge to create a problem to solve? (ie, set up a math problem based on scientific knowledge without help. How are Dimension boxes applied based on units	Test and quizzes Simple Stoichiometry calculation Labs Cheeto Calorimetry lab

			How do I calculate reactants?	
Behaviors and Math	Matter and Energy Behavior and Derivation Math	HS.Forces and Interactions	How can we determine behavior from a formula? How is the Gas Law used?	Test and quizzes Boyle's Law Lab Redox Lab
Chemical Classes and Behaviors	Quirks of the behaviors of Chemical Classes	HS.Forces and Interactions HS.Waves and Electromagnetic Radiation	What can we expect a compound to do if we know it's Chemical Class? What are the chemical classes and how are they used in real life	Test and quizzes Chemical Classification investigative Labs



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Intro Skills and Motion with Newtonian Forces	Basic skills and problem solving procedures Adapting to the language and the thinking Understand N's three Laws and apply $F=ma$ Mathematically solve gravity problems.	HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. HS-PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision. HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.	Physics requires a specific way of thinking and acting separate from the other sciences Motion can be described and quantified How does math model the properties of motion?	Test and Quizzes Foundation Math packet (trig, equations, literal translations) d,v,t Motion Lab
Energy and Waves (motion)	Understand the concept of E Create graphically and	HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the	Energy can be measured and modeled Conservation of	Test and Quizzes KE-PE Lab Wave Calculation Lab

	<p>mathematical models of E change</p> <p>Understand Mechanical waves</p>	<p>system are known.</p> <p>HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the with the relative position of objects.</p> <p>HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.</p>	<p>Energy Waves are a form of energy movement</p> <p>How is “Energy change” quantified?</p> <p>Why is Energy in a system conserved and lost.</p>	
<p>Thermodynamics and Electromagnetism</p>	<p>Understand and create/solve graphical and mathematical models of Thermal E</p> <p>Understand and apply electro-magnetic interactions</p>	<p>HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).</p> <p>HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction</p>	<p>Entropy and the perfect world vs real world</p> <p>Interaction between current, rotation, and force.</p> <p>Why is the 2<sup>nd</sup> law of thermodynamics one of the most powerful in physics, what does it determine?</p> <p>How are magnets and electricity connected?</p>	<p>Test and Quizzes</p> <p>Thermodynamics Lab</p> <p>Homemade electromagnets/Generator Lab</p> <p>Floating Triangle Lab</p>
<p>EM Waves and Light</p>	<p>Understand frequency vs wavelength, and medium speed changes</p> <p>Understand digital technology</p> <p>Understand EM and a wave an particle</p> <p>Understand EM Wave</p>	<p>HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.</p> <p>HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.</p> <p>HS-PS4-3. Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.</p> <p>HS-PS4-4. Evaluate the validity and reliability of</p>	<p>Waves are described by their wavelength and frequency.</p> <p>Technology uses EM waves.</p> <p>Light is particle that moves only like a waves.</p> <p>How is Energy stored and transferred in Waves?</p> <p>How do EM waves behave?</p>	<p>Test and Quizzes</p> <p>Light Diffraction Lab</p> <p>Mirror Lab</p> <p>Particle vs Wave research project</p>

	based technology	claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	How does modern technology use EM waves?	