| Standard ID | Standard Text | Edgenuity Lesson Name |
|---|---|---|
| NGSS.HS-PS. | PHYSICAL SCIENCE (NGSS) | |
| HS-PS1. | Matter and Its Interactions | |
| | Students who demonstrate understanding can: | |
| 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. | Atomic Spectra |
| HS-PS1-3. | Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. | Fundamental Forces<br>States of Matter<br>Changes of State |
| HS-PS2. | Motion and Stability: Forces and Interactions | |
| | Students who demonstrate understanding can: | |
| 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. | Speed and Velocity<br>Acceleration<br>Lab: Motion with Constant Acceleration<br>Fundamental Forces<br>Newton's First and Third Laws<br>Newton's Second Law<br>Lab: Newton's Second Law<br>Centripetal Acceleration<br>Circular Motion<br>Orbital Motion<br>Earth-Moon-Sun System |
| 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. | Impulse and Momentum<br>Conservation of Momentum<br>Lab: Conservation of Linear Momentum |
| 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. | Vectors<br>Projectile Motion<br>Impulse and Momentum<br>Conservation of Momentum<br>Lab: Conservation of Linear Momentum |

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| 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. | Fundamental Forces<br>Universal Law of Gravitation<br>Coulomb's Law |
| HS-PS2-5. | Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current. | Electromagnetic Waves<br>Electric Fields<br>Magnetic Field and Force<br>Electromagnetic Induction<br>Lab: Electromagnetic Induction<br>Applications of Electromagnetic Induction |
| HS-PS2-6. | Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. | Nanotechnology<br>Solid State Physics |
| HS-PS3. | Energy | |
| | Students who demonstrate understanding can: | |
| 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 system are known. | Potential Energy<br>Energy Transformations<br>Conservation of Energy<br>Temperature and Heat<br>First Law of Thermodynamics<br>Second Law of Thermodynamics<br>Heat Transfer |

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| HS-PS3-2. | Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as either motions of particles or energy stored in fields. | Kinetic Energy<br>Energy Transformations<br>Conservation of Energy<br>Temperature and Heat<br>States of Matter<br>Changes of State<br>Heat Transfer<br>Radiation<br>Electrostatics<br>Electric Fields<br>Electric Potential Difference<br>Ohm's Law<br>Electric Circuits<br>Lab: Circuit Design<br>Magnets and Magnetism<br>Magnetic Field and Force<br>Radioactivity<br>Lab: Half-Life Model<br>Fission and Fusion |
| 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. | Work and Power<br>Kinetic Energy<br>Energy Transformations<br>Technological Design<br>Temperature and Heat<br>Lab: Mechanical Equivalent of Heat<br>Heat Transfer<br>Radiation |
| 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). | Energy Transformations<br>Conservation of Energy<br>Temperature and Heat<br>Second Law of Thermodynamics<br>Heat Transfer |

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| 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. | Electric Fields<br>Magnetic Field and Force<br>Electromagnetic Induction<br>Lab: Electromagnetic Induction |
| HS-PS4. | Waves and Their Applications in Technologies for Information Transfer | |
| | Students who demonstrate understanding can: | |
| HS-PS4-1. | Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. | Introduction to Waves<br>Wave Properties<br>Wave Interactions<br>Sound Waves<br>Electromagnetic Waves<br>Reflection and Refraction<br>Mirrors<br>Lenses<br>Diffraction<br>Lab: Waves and Diffraction<br>Origin and Evolution of the Universe |
| HS-PS4-2. | Evaluate questions about the advantages of using a digital transmission and storage of information. | Sound Waves<br>Using Sound<br>Radio Waves and Applications |
| 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. | Dual Nature of Light |
| HS-PS4-4. | Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. | Electromagnetic Waves<br>Special Applications of Nuclear and Wave Phenomena |
| 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. | Using Sound<br>Radio Waves and Applications |

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| NGSS.HS-ETS. | ENGINEERING DESIGN (NGSS) | |
| HS-ETS1. | Engineering Design | |
| | Students who demonstrate understanding can: | |
| HS-ETS1-1. | Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. | Fission and Fusion |
| HS-ETS1-2. | Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. | Impulse and Momentum<br>Technological Design |
| HS-ETS1-3. | Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. | Applications of Electromagnetic Induction<br>Fission and Fusion |
| HS-ETS1-4. | Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. | Energy Transformations |