Science Core Units

Course Title:_____Science 10_____ Unit Title:_____Motion____ Length of Unit_____2wks____

Grade Level: ___10____ Page __ of ___

Standards & Benchmarks	Essential Questions, Learning Targets & "I can" Statements	Key Vocabulary	Suggested Assessment	Possible Resources
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**	Analyze graphs of distance vs time to identify speed and acceleration Analyze graphs of speed vs time to identify acceleration Identify and use appropriate units of measure for distances	Motion Reference point Speed Acceleration Distance Displacement Velocity Vector		

design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.				

High school science Core Units

Course Title:_____Science 10_____ Unit Title:_____Forces____ Length of Unit____3wks_____

Grade Level: ___10_____ Page __ of ___

Standards & Benchmarks	Essential Questions, Learning Targets & "I can" Statements	Key Vocabulary	Suggested Assessment	Possible Resources
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-PS2-5 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.	• Explain the relative strengths of the types of friction and apply them to real-world situations • Identify and apply newton's laws of motion to collisions (both elastic and inelastic) • Explain the difference between weight and mass • Calculate and explain momentum and apply it to real world examples • Apply Newtons laws of motion to real world situations. • Explain and apply Newtonian gravitational forces • Explain and apply electromagnetic forces in terms of electric motors and generators.	• Force • Mass • Weight • Gravity • Electromagnetism • Nuclear forces • Newton • Momentum • Friction • Projectile • Terminal velocity • Inertia • Centripetal force • Static, sliding, rolling, fluid • Elastic vs inelastic collision	• unit test • in class lab assignments • verbal responses • quizzes • textbook assignments • final exam	• Genecon hand crank generators • Batteries • Galvanometers • Spring sclaes • Roller carts • Pendulum • Pasco collision carts • Various masses • Magnets • Wires • Aluminum tube • Newton's cradle • Inertia ball • tape

High school Science Core Units

Course Title:____Science 10 _____ Unit Title:_____Fluid Forces_____ Length of Unit____2 wks_____

Grade Level: ____10____ Page __ of ___

Standards & Benchmarks	Essential Questions, Learning Targets & "I can" Statements	Key Vocabulary	Suggested Assessment	Possible Resources
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). **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 relative positions of particles (objects).**	• Be able to explain why objects sink or float • Be able to explain why planes can fly • Explain why curve balls work • Explain how hydraulic systems work • Explain why fluids are stored in different types of containers • Explain how and why boiling and evaporation are cooling processes including energy conversions • Explain vapor pressure and the effects of altitude on it. • Explain the effects of air pressure on climate • Explain why cooking is affected by weather systems. •	• Pressure • Area • Pascal • Fluid • Buoyancy • Archimedes Principle • Bernouli's Principle • Hydraulic system • Lift • Barotrauma	• unit test • in class lab assignments • verbal responses • quizzes • textbook assignments • final exam	• Vacuum pump and bell jar • Balloons • Water bottles • Marshmallows • Shaving cream • Aluminum foil • Washers • Pop bottle • Pop can • Water • Cartesian divers • Flettner rotor • Fan • Ping pong balls

High school science Core Units

Course Title:_____Science 10_____ Unit Title:_____Work and simple machines___ Length of Unit___2wks___

Grade Level: ___10___ Page __ of ___

Standards & Benchmarks	Essential Questions, Learning Targets & "I can" Statements	Key Vocabulary	Suggested Assessment	Possible Resources
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-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.***	• Explain how work is the transfer of energy • Identify and calculate work and power • Explain how and why different materials are used for different functional parts of a car • Explain how efficiency is a function of the friction in a simple machine	• Work • Power • Watt • Joule • Input and output force and distance • Mechanical advantage • Efficiency • Wedge • Lever • Pulley • Wheel & axle • Inclined plane • Screw • fulcrum	• unit test • in class lab assignments • verbal responses • quizzes • textbook assignments • final exam	• pasco carts • hand tools • projector • masses • ramps • spring scales • hand generators • simple machines • wd-40

High school science Core Units

Course Title:_____Science 10_____ Unit Title:_____Energy conversions___ Length of Unit___3wks___

Grade Level: ___10___ Page __ of ___

Standards & Benchmarks	Essential Questions, Learning Targets & "I can" Statements	Key Vocabulary	Suggested Assessment	Possible Resources
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 **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 relative positions of particles (objects). **HS-PS3-3.** Design, build, and refine a device that works within given constraints to convert	• Explain how work is the transfer of energy • Explain how and why different materials are used for different functional parts of a car • explain how energy is conserved in normal processes • describe the energy conversions in a compound machine • Explain how energy can be lost from a system and ways that we minimize those losses. • Explain the use of different substances in different applications that minimize energy loss • Be able to minimize energy conversions in a moving object • Identify the development and explain the efficiency of safety equipment in vehicles. •	• Work • Power • Watt • Joule • Input and output force and distance • Mechanical advantage • Efficiency • Wedge • Lever • Pulley • Wheel & axle • Inclined plane • Screw • fulcrum	• unit test • in class lab assignments • verbal rsponses • quizzes • textbook assignments • final exam	• pasco carts • newton's cradle • projector • masses • spring scales • hand generators • candles • calorimeters • light bulbs of different designs • insulation examples • specific heat demo • thermometers • springs • chromebooks • egg drop supplies • simple machines

	one form of energy into another form of energy.				
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				
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.				
HS-PS2-6.	Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.				