

Title: Physics and Technology

Unit: The Nature of Science					
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
The Nature of Science Science is Everywhere Scientific Methods Problem Solving Special Effects Exploring Science 2 weeks	3.2.9-12I	Constant Control Dependent variable Independent variable experiment hypothesis model observation physical science technology theory	Identifying and Controlling Variables Flex Your Brain clay boats paper tower Problem solving	McLaughlin, W., Thompson, (1999). Physical Science. New York: Glencoe, McGraw-Hill. Clay, newspaper, puzzles	Pendulum activity Vocabulary review assignment Study Guide Chapter test
Unit: Physical Science Methods					
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Physical Science Methods Standards of Measurement Using SI Units Graphing 2 weeks	3.2.9-12J	Density Derived unit Graph Kelvin Kilogram Liter Mass Meter Second SI Standard Time	Measurement Lab Converting Units Graphing Design a slow flyer Measuring forces	Chromebooks Coins mass balance rulers measuring tapes vernier calipers stopwatches	No need to count coins More graphing Vocabulary review assignment Study Guide Chapter test

Unit: Exploring Motion and Forces					
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

Motion; speed Velocity, acceleration Forces Friction Gravity 2 weeks	3.2.9-12k	Acceleration Average Speed Balanced forces Constant Speed Force Gravity Inertia Instantaneous speed Net force Speed Velocity Weight	Curve Matching Constant speed graph Motion and Speed Acceleration Newton's laws Mass vs. Weight Friction	Chromebooks with SparkVue Inclined planes Metronome Stopwatches Meter sticks Mass Balance Friction blocks Spring Scales	Constant speed graph Vocabulary review assignment Study Guide Chapter test
Unit:	Acceleration and Momentum				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Accelerated Motion Projectile and Circular Motion Satellites Action-Reaction Momentum 2 weeks	3.2.9-12L	Air Resistance Artificial satellite centripetal acceleration centripetal force Law of conservation of momentum momentum Newton's second law of motion Newton's third law of motion projectile terminal velocity	Second and Third law demonstrations Gravity Constant force Projectile activity Circular motion demos and activity Satellites Air resistance Spin Stabilization	Inertial mass Chromebook with sparkview Motion sensors Force sensors Coffee Filters Trashbags and string Constant speed buggy Tops and Levitron	Satellites research Vocabulary review assignment Study Guide Chapter test
Unit:	Energy				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

Energy and Work Temperature and Heat Thermal Pollution Measuring Thermal Energy 2 weeks	3.2.9-12O,P,Q	Energy Heat Kinetic energy Law of conservation of energy mechanical energy potential energy specific heat temperature thermal energy thermal pollution work	Types of energy energy conservation Temperature and heat Thermal pollution calorimetry experiment	Chromebooks with SparkVue Temperature sensors “An Inconvenient Truth” Hot plate Beakers Colored ice metal objects	Thermal pollution Calorimetry experiment Vocabulary review assignment Study Guide Chapter test
Unit:	Using Thermal Energy				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Thermal Energy on the Move Using Heat to Stay Warm Using Heat to Do Work Energy From the Oceans 2 weeks	3.2.9-12O,P,Q	Combustion Conduction Convection External combustion engine Fluid Heat Engine Heat Mover Insulator Internal combustion engine Radiation Radiator Solar collector Solar energy	Thermal Energy moving Convection currents Staying warm Heat movers Newton cooling graph	Chromebooks with SparkVue Temperature sensors Hot plate Beakers Sterling engine	Vocabulary review assignment Study Guide Chapter test
Unit:	Machines - Making Work Easier				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

<p>Why We Use Machines Simple Machines Mending with Machines Using Machines</p> <p>2 weeks</p>	3.2.9-12O,P,Q	<p>Bionics Compound machine Efficiency Effort arm Effort force Fulcrum Ideal machine Inclined plane Lever Machine Mechanical advantage Power Resistance arm Resistance force Screw Simple machine Wedge Wheel and Axle</p>	<p>Types of machines Levers activity Build a balance Pulley activity Inclined Plane activity Lego machines</p>	<p>Levers pulleys inclined planes spring scales friction blocks coins Lego kits</p>	<p>Lever worksheet Pulley worksheet Inclined plane worksheet Lego worksheet Vocabulary review assignment Study Guide Chapter test</p>
Unit:	Waves and Sound				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
<p>Characteristics of Waves The Nature of Sound Sound in Medicine Music</p> <p>2 weeks</p>	3.2.9-12O,P,Q	<p>Acoustics Amplitude Compressional wave Crest Frequency Intensity Interference Loudness Medium Music Noise Pitch Resonance Reverberation Transverse wave Trough Ultrasonic technology Wave Wavelength</p>	<p>Spring activity Wave machine Cup and String Doppler effect Audible Range Interference</p>	<p>Chromebooks with SparkVue Gummy's, tape, and sticks Doppler demo Sound generator Picket fences</p>	<p>Vocabulary review assignment Study Guide Chapter test</p>
Unit:	Light				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

Electromagnetic Radiation Light and Color Light bulbs Wave Properties 2 weeks	3.2.9-12O,P,Q	Diffraction Electromagnetic radiation Fluorescent Incandescent Modulation Opaque Pigment Reflection Refraction Translucent Transparent Visible radiation	E & M radiation Color - light Color - pigment Battle of the bulbs Reflection lab Refraction lab	Primary light Paint and brushes Incandescent, fluorescent, and LED bulbs mirrors lenses rulers	Primary pigment painting Reflection lab Refraction lab Vocabulary review assignment Study Guide Chapter test
Unit:	Mirrors and Lenses				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
The Optics of Mirrors The Optics of Lenses Optical Instruments The Hubble Space Telescope Light Applications 2 weeks	3.2.9-12O,P,Q	Coherent light Concave and convex Focal point Incoherent light Microscope Optical fiber Polarized light Reflecting telescope Refracting telescope TIR Virtual image	Reflections of reflections activity Curved mirror activity Reflecting Telescope Demo The human eye Curved lenses Optical instruments Light applications TIR	Curved mirrors Curved lenses light source Microscope Telescope Laser Diffraction gratings	Curved mirror activity Curved lens activity Vocabulary review assignment Study Guide Chapter test