

Grade 6 Science

Authors: Rich Jensen, Rebecca Kieffer, Molly Lindquist, Janet Peterson

September 2020

Content	Skills	Learning Targets	Standards	Assessment	Resources & Technology
<p>CEQ:</p> <p>WHAT IS THE NATURE OF PHYSICAL SCIENCE?</p> <p>WHAT IS THE NATURE OF ENGINEERING?</p> <p><i>UEQ: Matter</i></p> <p><i>A. How do we measure matter?</i></p>	<p>Matter</p> <p>A1. Measure mass, weight, volume and calculate density</p> <p>A2. Estimate, measure and convert using the metric system</p>	<p>Matter</p> <p>A. I can define and identify matter. LT1</p> <p>A. I can define and measure mass. LT2</p> <p>A. I can define and measure weight. LT3</p> <p>A. I can define and measure volume. LT4</p> <p>A. I can define and calculate density. LT5</p> <p>A. I can convert using the metric system. LT6</p>	<p>Matter</p> <p>6.2.1.1.1 6.2.1.2.1 6.2.1.2.2 6.2.1.2.3</p>	<p>Matter</p> <p>CFA: How Massive Lab</p> <p>CSA: Matter, Mass, and Weight Quiz</p> <p>CSA: Volume Quiz</p> <p>CSA: Density Quiz</p>	<p>Matter</p> <p><u>Labs</u> How Massive How Heavy Volume (Formula and Displacement) Density Blocks Density Liquid/Column Sink or Float <u>Technology</u> Qwizdom Mass, Weight and Volume Labs Properties of Matter Virtual Lab (liquid density) <u>Key Vocabulary</u> matter, mass, weight, volume, density</p>

<p><i>B. How can we identify matter using its properties?</i></p>	<p>B. Identify and classify matter according to its properties</p>	<p>B. I can define and give examples of physical properties. LT7</p> <p>B. I can define and give examples of chemical properties. LT8</p>		<p>CSA: Lessons 2-3 Quiz_Properties_Changes</p>	<p><u>Labs</u> Identify Unknown Substances Physical or Chemical Change? GAK Classifying Mixtures Separating Mixtures</p>
<p><i>C. What happens to a substance when it undergoes a physical or chemical change?</i></p>	<p>C. Describe how mass is conserved during physical change in closed system</p>	<p>C. I can define and give examples of physical changes. LT9</p> <p>C. I can define and give examples of chemical changes. LT10</p> <p>C. I can describe what happens to the mass of a substance when it goes through a change. LT11</p>			<p><u>Key Vocabulary</u> physical property, chemical property physical change, chemical change, law of conservation of mass</p>
<p><i>D. What makes up matter?</i></p> <p><i>E. How do atoms and molecules move?</i></p>	<p>D. Identify atoms and molecules</p> <p>E. Describe how atoms and molecules move in solids, liquids and gases</p>	<p>D. I can identify what makes up matter. LT12</p> <p>E. I can describe how particles move and are arranged in each state of matter. LT13</p>		<p>CSA: Lesson 5: States of Matter</p> <p>Lesson 6: Changes of State Writing Assessment</p>	<p><u>Labs</u> Ice Cream in a Bag Exploring the States of Matter Melting and Freezing Points Lab Boiling Point Condensation and Evaporation</p>


Content	Skills	Learning Targets	Assessment	Resources & Technology
UEQ: Engineering	Engineering	Engineering	Engineering	Engineering
<i>A. What is required of an engineer?</i>	A. Recognize that an engineer makes lives easier by creating or improving products and systems	A. I can explain the purpose of engineering. LT1	CFA: Design Process Personal Journal	<u>Labs</u> Black Box Drought Stopper Humdinger Robot Arm Pugh Chart Analysis (Staple Remover or Tape Dispenser)
<i>B. How does engineering impact our daily lives?</i>	B. Identify a common engineered system and evaluate its impact on the daily life of humans.	B. I can explain how products we use are created and improved. LT2 B. I can analyze technology to make decisions about technology. LT3	CSA: Engineering, Models and the Design Process Quiz 1 CSA: Methods of Analysis, Systems and Engineering and Our World Quiz 2	<u>Technology</u> Light Bulb Usage Costs Light Bulb Analysis Google Docs Presentations Methods of Analysis Virtual Lab
<i>C. How would you use the design process to construct a product or system that resolves a problem?</i>	C1. Construct a product or system that resolves a problem using the design process C2. Identify design constraints C3. Describe a system in terms of its subsystems and parts	C. I can use the design process to solve a problem. LT4 C. I can identify design benefits and constraints. LT5 C. I can explain how a system works. LT6		Risk Benefit Analysis with Persuasive Letter <u>Informative Writing</u> Positive and Negative Effects of a Technology on Society Purpose of Engineering Paragraph (after Engineering Fair)

<p><i>D. What are the results of engineering?</i></p>	<p>D. Explain the importance of learning from past failures in order to improve future designs</p>	<p>D. I can recognize that past failures can be used to improve future designs. LT7</p>		<p><u>Key Vocabulary</u> engineering, Design Process, design constraints, design criteria, consensus, conceptual model, physical model, black box, technology, systems, control, input, output, prototype</p>
-------------------------------------------------------	----------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Content	Skills	Learning Targets	Assessment	Resources & Technology
UEQ: Energy	Energy	Energy	Energy	Energy
<i>A. How can energy be transformed?</i>	<p>A1. Differentiate between kinetic and potential energy</p> <p>A2. Analyze situations where kinetic energy is converted to potential energy and vice versa</p> <p>A3. Identify energy conversions in devices: thermal, electrical, chemical, mechanical and others</p>	<p>A. I can explain the difference between kinetic and potential energy. (LT1)</p> <p>A. I can give examples of different forms of energy. (LT2)</p> <p>A. I can explain what happens when energy is converted from one form to another. (LT3)</p>	<p>CSA: Unit 2 Lesson 1 Introduction to Energy Quiz</p> <p>CFA: Energy Transformation Video</p> <p>CSA: Unit 2 Lesson 2-3 Temperature, Thermal Energy, and Heat Quiz</p> <p>CSA: Unit 2 Lesson 3 Methods of Heat Transfer Quiz</p> <p>Unit 2 Assessment (Energy Test or Energy Flipbook Project)</p>	<p><u>Labs</u></p> <p>Investigating Potential Energy (with K'NEX cars) Mini Shuttle Ride</p> <p>Food Energy Conversion Lab</p> <p>Explore Temperature (build thermometer)</p> <p>Calorie Lab</p> <p>Exploring Heat</p> <p>Exploring Temperature and Thermal Energy</p> <p>Thermal Properties-Heat Transfer</p> <p>Heat Transfer - Conduction, Convection, Radiation</p> <p>Investigating Convection Insulator (Cold Stuff)</p> <p>Popcorn (demonstration)</p> <p><u>Technology</u></p> <p>Energy Transformation Videos (with Flip Cameras)</p> <p>Temperature and Kinetic Energy Virtual Lab</p> <p>Thermal Energy and Heat Virtual Lab</p>
<i>B. How can energy be transferred?</i>	B1. Describe how energy is transferred in conduction, convection and radiation	<p>B. I can relate temperature to the kinetic energy of particles. (LT4)</p> <p>B. I can measure temperature using different scales. (LT5)</p> <p>B. I can explain the difference between thermal energy, temperature, and heat. (LT6)</p>		


		<p>B. I can explain how energy is transferred during conduction. (LT7)</p> <p>B. I can explain how energy is transferred during convection. (LT8)</p> <p>B. I can explain how energy is transferred during radiation. (LT9)</p>		<p>Forces Virtual Lab (kinetic and potential energy) - found in Motion and Forces Lesson 3</p> <p><u>Argument Writing</u> Alternative Energy Opinion Paragraph</p> <p><u>Key Vocabulary</u> energy, kinetic energy, potential energy, mechanical energy, energy transformation, law of conservation of energy kinetic theory of matter, temperature, degree, thermometer thermal energy, heat, calorie, conduction, conductor, insulator, convection, radiation</p>
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

April 2015

Content	Skills	Learning Targets	Assessment	Resources & Technology
<p><i>UEQ: Motion and Forces</i></p>  <p><i>A. How can motion be described?</i></p> <p><i>B. How do forces affect motion?</i></p>	<p>A1. Describe position using reference points</p> <p>A2. Measure, calculate and graph the speed of an object that is traveling in a straight line</p> <p>A3. Use a velocity-time graph to show an object's acceleration</p> <p>B1. Distinguish between balanced and unbalanced forces</p> <p>B2. Describe the results of net forces</p> <p>B3. Distinguish between contact forces and forces that act at a distance</p> <p>B4. Use Newton's Laws to describe motion</p>	<p>A. I can describe the position of an object using reference points. (LT1)</p> <p>A. I can measure, calculate, and graph speed. (LT2)</p> <p>A. I can explain the difference between speed and velocity. (LT3)</p> <p>A. I can define acceleration. (LT4)</p> <p>A. I can use a velocity-time graph to show an object's acceleration. (LT5)</p> <p>B. I can explain the difference between balanced and unbalanced forces. (LT6)</p> <p>B. I can describe the results of net force. (LT7)</p> <p>B. I can recognize the difference between direct</p>	<p>CSA: Unit 3 Lesson 1 Motion, Speed and Acceleration Quiz</p> <p>CSA: Unit 3 Lesson 3 Forces Quiz</p> <p>CSA: Unit 3 Lesson 3 Newton's Laws Quiz</p> <p>Motion & Forces Unit Assessment (Analyze 3 situations project)</p>	<p>Labs</p> <ul style="list-style-type: none"> ● Mystery Station (compasses and reference points) ● Spark Timer (Testing for Speed) ● Investigate Average Speed Lab ● Acceleration and Slope ● Observing Inertia (Newton's 1st Law) ● Inertia Games/Exploring Inertia ● Investigate Forces ● Indirect Forces - Investigating Gravity, Magnetism, Electromagnet ● Newton's 1st Law ● Newton's 2nd Law ● Newton's 3rd Law <p>Technology</p> <ul style="list-style-type: none"> ● Newton's 2nd Law Simulation

		<p>contact forces and forces that act at a distance. (LT8)</p> <p>B. I can use Newton's 1st Law to describe motion. (LT9)</p> <p>B. I can use Newton's 2nd Law to describe motion. (LT10)</p> <p>B. I can use Newton's 3rd Law to describe motion. (LT11)</p>		<ul style="list-style-type: none"> ● Microsoft Excel Distance Time Graph <p>Key Vocabulary</p> <ul style="list-style-type: none"> ● position, reference point, motion, speed, vector, velocity ● acceleration, centripetal acceleration ● force, net force, direction force, indirect force, inertia, Newton's Laws, balanced forces, unbalanced forces
--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

May 2015

Content	Skills	Learning Targets	Assessment	Resources & Technology
<p><i>UEQ:</i> Waves, Sound, and Light </p> <p><i>A. How do waves transfer energy?</i></p> <p><i>B. What are the properties of waves?</i></p>	<p>A1. Recognize that a wave is a disturbance in the medium, not the movement of the medium itself</p> <p>A2. Distinguish between wave types based on medium and direction of motion</p> <p>B1. Describe properties of waves, including speed, wavelength, frequency, amplitude, wave period</p> <p>B2. Recognize that a wave changes speed as it enters different medium</p>	<p>A. I can define and classify waves. (LT1)</p> <p>B. I can identify the parts of a wave. (LT2)</p> <p>B. I can calculate the speed of a wave. (LT3)</p> <p>B. I can describe what happens to a wave's speed as it enters a different medium. (LT4)</p> <p>B. I can determine the relationship between a change in a wave's energy and its amplitude, frequency, and wavelength. (LT5)</p> <p>B. I can determine the relationship between a change in a wave's</p>	<p>CSA: Lesson 1 Waves Quiz</p> <p>CSA: Lesson 2 Properties of Waves Quiz</p> <p>CSA: Sound Lessons 1 and 2 Quiz</p> <p>Light Quiz Lessons 1 and 2</p>	<p>Labs</p> <ul style="list-style-type: none"> ● Creating Transverse and Longitudinal Waves ● Investigate Frequency ● Investigate Wavelength ● Sound Rotations ● Explore Refraction with prisms. ● White Light/EM Spectrum ● Types of Light Reflection ● Transparent, Translucent, Opaque ● Light Reflection and Absorption using solar ovens <p>Outdoor Activity</p> <ul style="list-style-type: none"> ● Solar Oven ● Solar Energy (K'NEX - mini

<p><i>C. How do sound waves travel?</i></p> <p><i>D. How does light interact with matter?</i></p>	<p>C. Explain how the vibration of particles in air and other materials transfer energy as sound waves</p> <p>D. Use wave properties of light to explain reflection, refraction, and the color spectrum</p>	<p>frequency and its amplitude and wavelength. (LT6)</p> <p>C. I can describe how sound waves transfer energy. (LT7)</p> <p>C. I can relate pitch to a wave's frequency and wavelength. (LT8)</p> <p>C. I can relate loudness to a wave's amplitude and energy. (LT9)</p> <p>C. I can describe how sound waves interact with matter. (LT10)</p> <p>D. I can use wave properties of light to explain reflection. (LT11)</p> <p>D. I can use wave properties of light to explain refraction. (LT12)</p> <p>D. I can use wave properties of light to explain the color spectrum. (LT13)</p>		<p>shuttle ride, car, crank man)</p> <p>Technology</p> <ul style="list-style-type: none"> ● Wave on a String Lab ● Sound Simulation - Sounds Amazing and PhET Sound ● Color Vision PhET <p>Argument Writing</p> <ul style="list-style-type: none"> ● Solar Energy Argument <p>Key Vocabulary</p> <ul style="list-style-type: none"> ● wave, medium, longitudinal wave, transverse wave, mechanical wave, electromagnetic wave, sound wave ● amplitude, wavelength, wave period, frequency, hertz, wave speed ● sound wave, pitch, loudness, decibel, Doppler Effect
---------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

				<ul style="list-style-type: none">● radiation, Electromagnetic Spectrum, infrared, ultraviolet● transparent, translucent, opaque, absorption, reflection, refraction, scattering, diffraction
--	--	--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------