



# 8th Grade Physical Science Pacing Guide 2019-20



This pacing guide reflects the changes in the SOL's for 2018.

## SOL PS.1

SOL PS.1	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th Grade SOL
1.a 8/8-8/9	<b>Lab Safety</b>  (And throughout the year)	<ul style="list-style-type: none"> <li>independently and collaboratively plan (DOK 4) and conduct observational and experimental investigations; identify variables, constants, and controls where appropriate and include the safe use of chemicals and equipment</li> </ul>	<p><b>YouTube video--"Teaching Some Science--the Big Bang Theory"</b>  <a href="https://www.youtube.com/watch?v=PzwTxVncWrl">https://www.youtube.com/watch?v=PzwTxVncWrl</a></p> <p><b>General Recap of Lab Safety--video notes</b>  <a href="https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_general_lab_safety.pdf">https://www.amoebasisters.com/uploads/2/1/9/0/21902384/video_recap_of_general_lab_safety.pdf</a></p> <p><b>Physical Science Practice e-book</b>            pg.2 Lab Safety</p> <p><b>YouTube video--Amoeba Sisters "General Lab Safety"</b>  <a href="https://www.youtube.com/watch?v=MEIXRLcC6R">https://www.youtube.com/watch?v=MEIXRLcC6R</a></p>		

<p>8/14-8/16</p>	<hr/> <p><b>Experimental Variables</b></p>	<p><b>Asking Questions and Defining Problems</b></p> <ul style="list-style-type: none"> <li>ask questions that require empirical evidence to answer</li> </ul> <hr/> <ul style="list-style-type: none"> <li>develop hypotheses indicating relationships between independent and dependent variables (DOK 3)</li> </ul>			
<p>8/12-8/13</p>	<hr/> <p><b>Metric Measurement</b></p> <p>(And throughout the year)</p>	<hr/> <ul style="list-style-type: none"> <li>take metric measurements using appropriate tools and technologies (DOK 1)</li> </ul>	<hr/> <p><b>YouTube video: "Big Bang Metric Area Conversion"</b>  <a href="https://www.youtube.com/watch?v=dstpxhij52k">https://www.youtube.com/watch?v=dstpxhij52k</a>  <b>"Why the Metric System Matters"</b>  <b>Ted Ed.</b>  <a href="https://www.youtube.com/watch?v=7bUVjJWA6Vw">https://www.youtube.com/watch?v=7bUVjJWA6Vw</a></p> <p><b>BrainPop: Measuring Matter</b></p> <p><b>Metric Measurement Sorting Cards (differentiation)</b></p>		

			<p><b>Interactive Notebook--Physical Science</b> Mass vs. Weight, p.23</p> <p><b>Physical Science Practice e-book</b> Using Correct Units, pg.10</p> <p><b>Physical Science Practice e-book</b> Metrics and Measurement, p.8</p> <p><b>Physical Science Practice e-book</b> Using the Balance, p.4 Measuring Length, p.5 Measuring Liquids, p.6 Reading Thermometers, p.7</p>		
1.b 8/19- 8/21	<p><b>The Scientific Method</b></p> <p>(And throughout the year)</p>	<p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>independently and collaboratively plan and conduct observational and experimental investigations (DOK 4); identify variables, constants, and controls where appropriate (DOK 1) and include the safe use of chemicals and equipment (DOK 2)</li> <li>evaluate the accuracy of various methods for collecting data (DOK 4)</li> <li>apply scientific ideas or</li> </ul>	<p><b>Leveled Texts: Newsela-- A Step-By-Step Guide to the Scientific Method</b> <a href="https://newsela.com/read/lib-scientific-method/id/37287">https://newsela.com/read/lib-scientific-method/id/37287</a></p> <p><b>LAB--“Keep It Warm, Keep It Chill”, PBL Learning in the Physical Science Classroom, p.189</b></p> <p><b>Physical Science Practice e-book</b> Scientific Method, p.1</p> <p><b>AACT Density Simulation:</b> <a href="https://teachchemistry.org/periodical/issues/september-2015/density">https://teachchemistry.org/periodical/issues/september-2015/density</a></p>	<p><b>Lesson Quiz: Steps of the Scientific Method</b></p>	

		principles to design, construct, and/or test a design of an object, tool, process or system (DOK 4)			
1.c 8/22- 8/23	<b>Data Tables and Graphs</b>  (Throughout the year)	<p><b>Interpreting, analyzing, and evaluating data</b></p> <ul style="list-style-type: none"> <li>· offer simple solutions to design problems (DOK 3)</li> <li>· construct and interpret data tables showing independent and dependent variables, repeated trials, and means (DOK 3)</li> <li>· construct, analyze, and interpret graphical displays of data and consider limitations of data analysis (DOK 3)</li> <li>· apply mathematical concepts and processes to scientific questions (DOK 2)</li> <li>· use data to evaluate and refine design solutions to best meet criteria (DOK 3)</li> </ul>	<b>Physical Science Practice e-book</b> Graphing of Data, p. 14		
1.d	<b>The Nature of Science</b>  (And throughout the year)	<p><b>Constructing and critiquing conclusions and explanations</b></p> <ul style="list-style-type: none"> <li>· construct scientific explanations based on valid and</li> </ul>	<p><b>Quizlet: 7 Aspects of the Nature of Science</b></p> <p><a href="https://quizlet.com/117602172/7-aspects-of-nature-of-science-flash-cards/">https://quizlet.com/117602172/7-aspects-of-nature-of-science-flash-cards/</a></p>		

		<p>reliable evidence obtained from sources (including the students' own investigations) (DOK 3)</p> <ul style="list-style-type: none"> <li>· construct arguments supported by empirical evidence and scientific reasoning (DOK 3)</li> <li>· generate and compare multiple solutions to problems based on how well they meet the criteria and constraints (DOK 3)</li> <li>· differentiate between a scientific hypothesis, theory, and law (2.a) (DOK 3)</li> </ul>			
1.e	(throughout the year)	<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>· construct, develop, and use models and simulations to illustrate and/or explain observable and unobservable phenomena (2.a)(DOK 4)</li> <li>· evaluate limitations of models (DOK 3)</li> </ul>			
1.f	(throughout the year)	<p><b>Obtaining, evaluating, and communicating information</b></p> <ul style="list-style-type: none"> <li>· read scientific texts, including those adapted for classroom use, to determine the central idea and/or obtain</li> </ul>			

		<p>scientific and/or technical information (DOK 1)</p> <ul style="list-style-type: none"> <li>gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication (DOK 3)</li> <li>construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning (2.c) (DOK 3)</li> </ul>			
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## SOL PS.2

The student will investigate and understand that matter is composed of atoms. Key ideas include:

SOL PS.2	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessment	6th Grade SOLs
2.a 8/26-8/	<b>History of Atomic Theory</b>	<b>Our understanding of atoms has developed over time.</b>	<b>YouTube: "Introduction to Chemistry" Frank Gregorio</b>	<b>Unit Test--Summative</b>	

<p>30</p>	<p><b>Hypotheses, Theories, and Laws</b></p>	<p><b>Provide examples to demonstrate how the development of atomic theory illustrates the nature of science. (DOK 3)</b></p> <hr/> <p><b>Differentiate between scientific hypotheses, theories, and laws. (DOK 3)</b></p>	<p><a href="https://www.youtube.com/watch?v=izeuGr0lbN0&amp;t=3s">https://www.youtube.com/watch?v=izeuGr0lbN0&amp;t=3s</a></p> <p><b>BrainPop: Atoms</b>  <a href="https://www.brainpop.com/science/matterandchemistry/atoms/">https://www.brainpop.com/science/matterandchemistry/atoms/</a></p> <p><b>CK12 Thompson’s Atomic Model</b>  <a href="https://www.ck12.org/book/CK-12-Physical-Science-Concepts-For-Middle-School/section/3.13/">https://www.ck12.org/book/CK-12-Physical-Science-Concepts-For-Middle-School/section/3.13/</a></p> <p><b>Historical Models of Atoms Graphic Organizer</b></p> <p><b>History of Atomic Theory Timeline</b></p> <p><b>Comparing the Bohr Model to the Electron Cloud Model</b>        (teacher created, based on ESSd)</p> <p><b>GCSE-Bitesize</b> “Development of Atomic Theory”  <a href="http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/periodic_table/atomstrucrev5.shtml">http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/periodic_table/atomstrucrev5.shtml</a></p> <p><b>TedEd Video: “The 2,400 Year Search for the Atom”</b>  <a href="https://www.youtube.com/watch?v=xazQRcSCRaY">https://www.youtube.com/watch?v=xazQRcSCRaY</a></p> <p><b>Particle Theory of Matter HW</b>        (teacher created)</p>	<p><b>Lesson Quiz: History of Atomic Theory</b></p> <p><b>Formative--</b>  <b>”History of Atomic Theory Timeline”</b></p> <p><b>“Historical Models of Atoms Graphic Organizer” (CW)</b></p> <p><b>“Comparing Bohr Model to Electron Cloud Model”</b> Includes portion for students to provide examples to demonstrate how the development of atomic theory illustrates the nature of science.</p> <hr/> <p><b>Unit Test--Summative</b></p> <p><b>Lesson Quiz: Hypotheses, Theories, and Laws</b></p>	
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	<p>Particle Theory of Matter</p> <p>Modern Model of the Atom</p>	<p>Provide examples to demonstrate how the development of atomic theory illustrates the nature of science. (DOK 3)</p> <p>Construct and use models and simulations to represent the structure of atoms (DOK 2); evaluate the limitations of models used. (DOK 3)</p> <p>Compare and contrast the location, charge and relative mass of protons, neutrons, and electrons in a single atom. (4.a) (DOK 3)</p>	<p>Phet-”Build An Atom” Simulation  <a href="https://phet.colorado.edu/en/simulation/build-an-atom">https://phet.colorado.edu/en/simulation/build-an-atom</a>  Plus, “Build An Atom Guided Inquiry” (modified for sped version included)  <a href="https://phet.colorado.edu/en/contributions/view/3954">https://phet.colorado.edu/en/contributions/view/3954</a>    “The Structure of Atoms Info Sheet”  (teacher created)</p>	<p>Unit Test--Summative</p> <p>Lesson Quiz: Particle Theory of Matter</p> <p>Unit Test--Summative</p> <p>Lesson Quiz: Structure of an Atom</p> <p>Formative: Completed Build an Atom Guided Inquiry Packet</p>	
2.b 9/16- 9/27	Intro to the PTE	The periodic table can be used to predict the chemical and physical properties of	Elements and Chem Symbols Sorting Cards (differentiation)	Unit Test--Summative Formative--”Getting to Know Your Periodic	

	<p style="text-align: center;">_____</p> <p><b>Families or Groups of the Periodic Table</b></p>	<p><b>matter.</b></p> <p style="text-align: center;">_____</p> <p><b>Interpret data in the periodic table to predict the chemical and physical properties of main group elements. (DOK 2)</b></p>	<p><b>BrainPop video: “Periodic Table of Elements”</b>  <a href="https://www.brainpop.com/science/matterandchemistry/periodictableofelements/">https://www.brainpop.com/science/matterandchemistry/periodictableofelements/</a></p> <p><b>BrainPop Sortify: “Elements of the Periodic Table”</b>  <a href="https://www.brainpop.com/games/sortifyelements/softheperiodictable/">https://www.brainpop.com/games/sortifyelements/softheperiodictable/</a></p> <p><b>Physical Science Practice e-book</b>  Elements and Their Symbols, p.66</p> <p><b>Online Periodic Tables: Interactive:</b>  <a href="https://www.ptable.com/">https://www.ptable.com/</a></p> <p><b>(Flashcards--30 Most common elements</b> (review of 6th grade)</p> <p style="text-align: center;">_____</p>	<p><b>Table Worksheet”</b></p> <p><b>Lesson Quiz: Features of the Periodic Table</b></p> <p style="text-align: center;">_____</p> <p><b>Lesson Quiz: Common Elements</b></p> <p style="text-align: center;">_____</p> <p><b>Unit Test--Summative</b></p> <p><b>Lesson Quiz: Groups of the Periodic Table</b></p>	
<p>2.c 11/4- 11/15</p>		<p><b>The kinetic molecular theory is used to predict and explain matter interactions.</b></p> <p><b>Interpret diagrams representing different phases</b></p>		<p><b>Unit Test--Summative</b></p>	

		<p>of matter. (DOK 2)</p> <p>Construct and use models and simulations to represent and/or explain the atom and phases of matter (DOK 3); evaluate the limitations of models used when appropriate. (DOK 4)</p> <p>Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. (DOK 3)</p> <p>Compose evidence-based conclusions, explanations, and arguments to identify changes in matter when thermal energy is added or taken away. (1.f) (DOK 4)</p>			
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**PS.2 Unit Vocabulary**

Atoms, Atomic mass, Atomic number, Change of state, Chemical properties, Electrons, Electromagnetic force, Energy levels, Group, Hypothesis, Kinetic energy, Neutrons, Nucleus, Physical properties, Proton, Pure substance, Scientific law, Sub-atomic particles, Theory, Thermal energy, Valence electrons

## SOL PS.3

The student will investigate and understand that matter has properties and is conserved in chemical and physical processes.

PS.3 SOL	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th grade SOL's
3.a 9/30- 10/4	<b>Chemical and Physical Properties</b>  <b>Physical Properties</b>  <b>Chemical Properties</b>  <b>Determining Density</b>	<b>Pure substances can be identified based on their chemical and physical properties</b>  <b>Distinguish between physical properties and chemical properties of matter. (DOK 3)</b>  <b>Generate, analyze, and interpret data in tables, graphs, charts, diagrams, and/or other displays related to physical and chemical properties of matter. (DOK 3)</b>  <b>Apply mathematical and computational thinking to calculate and compare the</b>	<b>BrainPop: pH Scale, Acids and Bases</b>  <b>Physical Science Practice e-book</b> Acid, Base, or Salt?, p.90 pH, p.91 pH of Salt Solutions, p.92  <b>Interactive Notebook--Physical Science</b> pH--Acids and Bases, p.21  <b>Phet Simulation: Acid-Base Solutions</b> <a href="https://phet.colorado.edu/sims/html/acid-base-solutions/latest/acid-base-solutions_en.html">https://phet.colorado.edu/sims/html/acid-base-solutions/latest/acid-base-solutions_en.html</a>  YouTube video: <i>Particles of Your World, Crash Course Kids</i> <a href="https://www.youtube.com/watch?v=npv74D2MO6Q">https://www.youtube.com/watch?v=npv74D2MO6Q</a>	<b>Unit Test--Summative</b>  <b>Lesson Quiz: Physical Properties</b>	

	<p><b>Identifying a Pure Substance</b></p> <p><b>Elements, Compounds and Mixtures</b></p>	<p><b>densities of substances. (DOK 2)</b></p> <p><b>Plan and carry out investigations to explore the relationship between mass, volume, and density, collecting and analyzing data in metric and SI units.(3.a) (DOK 4)</b></p> <p><b>Generate, analyze, and interpret data in tables, graphs, charts, and/or other displays related to mass, volume, and density.(3.a) (DOK 3)</b></p> <p><b>Identify and describe a pure substance based on its physical and/or chemical properties. (DOK 2)</b></p> <p><b>Provide examples of the specific uses of matter that are suited to their physical or chemical properties. (DOK 1)</b></p> <p><b>Differentiate between elements, compounds,</b></p>	<p><b>BrainPop: States of Matter</b></p> <p><b>Chem4Kids website--"Matter"</b> (with interactive quiz_ <a href="http://www.chem4kids.com/files/matter_intro.html">http://www.chem4kids.com/files/matter_intro.html</a>)</p> <p><b>Phases of Matter Class Notes</b></p> <p><b>Physical Science Practice e-book</b> States of Matter Crossword, p.65 Separation of Mixtures, p.64</p> <p><b>Interactive Notebook--Physical Science</b> States of Matter, p.11 "Molecules to Know" hands on activity</p> <p><b>Leveled text: Newsela--Matter and Energy, What is Matter?</b> <a href="https://newsela.com/read/elem-sci-matter/id/29109">https://newsela.com/read/elem-sci-matter/id/29109</a></p> <p>Phet: Density <a href="https://phet.colorado.edu/en/simulation/legacy/density">https://phet.colorado.edu/en/simulation/legacy/density</a> With activity Sheet</p>	<p><b>Unit Test--Summative</b> Lesson Quiz: Elements, Compounds, and mixtures</p>	
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		and mixtures. (DOK 2)			
3.b 10/21- 10/25	<p><b>Chemical Changes</b></p> <p>(Done with 3.a)</p> <p>(Done with 3.a)</p> <p><b>Physical and Chemical Changes</b></p> <p><b>Chemical Changes Lab</b></p>	<p>Pure substances can undergo physical and chemical changes that may result in a change of properties</p> <p>Plan and carry out investigations to explore the relationship between mass, volume, and density, collecting and analyzing data in metric and SI units.(3.a) (DOK 4)</p> <p>Generate, analyze, and interpret data in tables, graphs, charts, and/or other displays related to mass, volume, and density.(3.a) (DOK 2)</p> <p>Distinguish between physical and chemical changes. (DOK 2)</p> <p>Compose evidence-based conclusions, explanations, and arguments from data obtained in investigation related to chemical changes in matter. (DOK 3)</p>	<p><b>BrainPop: Chemical Equations</b></p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding--</b> Chapter 12 Understanding Chemical Chan(DOK 4)ges(lab station activities)</p>	<b>Unit Test--Summative</b>	

	<p><b>Endothermic and Exothermic Reactions</b></p> <p><b>Elements, Compounds, and Mixtures</b></p>	<p>Analyze and interpret diagrams and/or other displays to determine if a chemical or physical change has occurred. (DOK 3)</p> <p>Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical change has occurred. (DOK 3)</p> <p>Using evidence and scientific reasoning to differentiate between a chemical reaction that requires an input of energy (endothermic) and other release energy (exothermic). (DOK 3)</p> <p>Apply scientific principles and the engineering process to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. (DOK 4)</p> <p>Differentiate between elements, compounds,</p>			
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		<p><b>mixtures. (DOK 2)</b></p> <p><b>Apply scientific principles to develop a plan to separate a mixture. (DOK 3)</b></p>			
<p>3.c 10/15- 10/18</p>	<p><b>Intro to Chemical Bonds</b></p> <p><b>Ionic fs. Covalent Bonds</b></p> <p><b>Which bonds Will Form?</b></p>	<p><b>Compounds form through ionic and covalent bonding</b></p> <p><b>Compare and contrast ionic and covalent bonding. (DOK 2)</b></p> <p><b>Apply scientific principles to predict is an ionic or covalent bond will likely form when main group metals and non-metals are chemically combined. (DOK 2)</b></p>	<p><b>ESS--Chemical Bonds</b></p> <p><b>BrainPop: "Chemical Bonds"</b>  <a href="https://www.brainpop.com/science/matterandchemistry/chemicalbonds/">https://www.brainpop.com/science/matterandchemistry/chemicalbonds/</a></p> <p><b>Physical Science Practice e-book</b>  Types of Chemical Bonds, p.74</p> <p><b>Interactive Notebook--Physical Science</b>  Chemical Bonds, p.15</p> <p><b>CK12 website--"Chemical Bonds"</b>  Reading, video, practice and more.  <a href="https://www.ck12.org/c/earth-science/chemical-bonds/">https://www.ck12.org/c/earth-science/chemical-bonds/</a></p> <p><b>Chem4Kids--Compound Basics</b>  <a href="http://www.chem4kids.com/files/atom_compounds.html">http://www.chem4kids.com/files/atom_compounds.html</a>  Chemical Bonds Quiz (interactive)  <a href="http://www.chem4kids.com/extras/quiz_atomcomp/index.html">http://www.chem4kids.com/extras/quiz_atomcomp/index.html</a></p> <p><b>BrainPop: Ions, Isotopes</b></p> <p><b>Exploring Our Fluid Earth: Covalent Bonds</b></p>	<p><b>Unit Test--Summative</b></p>	

			<a href="https://manoa.hawaii.edu/exploringourfluidearth/chemical/chemistry-and-seawater/covalent-bonding">https://manoa.hawaii.edu/exploringourfluidearth/chemical/chemistry-and-seawater/covalent-bonding</a>		
3.d 10/28- 11/1	<b>Chemical Reactions and Chemical Equations</b>  <b>Balancing Chemical Equation</b>	<b>Balanced chemical equations model the conservation of matter.</b>  <b>Identify the reactants and products in a given chemical equation. (DOK 1)</b>  <b>Apply the Law of Conservation of Mass to balance chemical equations. (DOK 2)</b>	<b>ESS--The Law of Conservation of Matter</b>  <b>BrainPop: Law of Conservation of Mass</b>  <b>Physical Science Practice e-book</b> Balancing Equations, p.85 Word Equations, p.85 Conservation of Mass, p.88  <b>pHet Balancing Chemical Equations</b> interactive <a href="https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_en.html">https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_en.html</a>  <b>Phet: Balancing Chemical Equations Student Handout</b> <a href="https://phet.colorado.edu/en/contributions/view/3955">https://phet.colorado.edu/en/contributions/view/3955</a>  <b>JLab</b> interactive practice balancing chem equations <a href="https://education.jlab.org/elementbalancing">https://education.jlab.org/elementbalancing</a>	<b>Unit Test--Summative</b>	

			g/ "Balancing Chemical Equations Worksheet" <a href="https://sciencenotes.org/balancing-chemical-equations-worksheet/">https://sciencenotes.org/balancing-chemical-equations-worksheet/</a>		
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## SOL PS.4

The student will investigate and understand that the periodic table is a model used to organize elements based on their atomic structure. Key ideas include:

PS.4 SOL's	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th grade SOL's
4.a 9/-3 9/13	Intro to the PTE  Particles of an Atom and the Periodic Table	Symbols, atomic numbers, atomic mass, chemical families (groups), and periods are identified on the periodic table  Compare and contrast the location, charge and relative mass of protons, neutrons, and electrons in a single atom. (taught with 2.a) (DOK	PTE with Electron Shell Numbers: <a href="http://theprometheanteachers.blogspot.com/2011/05/interactive-periodic-table-of-elements.html">http://theprometheanteachers.blogspot.com/2011/05/interactive-periodic-table-of-elements.html</a>  BrainPop: Periodic Table of Elements, Metals  Elements and Chem Symbols Sorting Cards (differentiation)	Unit Test--Summative  Lesson Quiz:	

	<p style="text-align: center;">Elements Isotopes</p>	<p>2)  <b>Recognize an atom's identity is related to the number of protons in its nucleus. (DOK 2)</b></p> <hr/> <p><b>Differentiate between atoms of an element and its isotopes. (DOK 2)</b></p>	<p><b>Leveled Text:</b>  <b>Newsela "The Periodic Table: A Classic Design"</b>  <a href="https://newsela.com/read/lib-convo-periodic-table-design/id/38102">https://newsela.com/read/lib-convo-periodic-table-design/id/38102</a></p> <p><b>Physical Science Practice e-book</b>  Elements and Their Symbols, p. 66</p> <p><b>Interactive Notebook--Physical Science</b>  Periodic Table, p.17</p> <p><b>Chem4Kids: "Periodic Table"</b>  interactive quiz  <a href="http://www.chem4kids.com/extras/quiz_elempertable/index.html">http://www.chem4kids.com/extras/quiz_elempertable/index.html</a></p> <p>NOVA: Developing the Periodic Table  <a href="https://www.pbslearningmedia.org/resource/nvhe.sci.chemistry.periodic.developing-the-periodic-table/?#.Wxa79UgvzIU">https://www.pbslearningmedia.org/resource/nvhe.sci.chemistry.periodic.developing-the-periodic-table/?#.Wxa79UgvzIU</a></p> <p><b>Physical Science Practice e-book</b>  Periodic Table Crossword, p.73</p> <hr/> <p><b>Phet: Isotopes and Atomic Mass</b>  <a href="https://phet.colorado.edu/sims/html/isotopes-and-atomic-mass/lat">https://phet.colorado.edu/sims/html/isotopes-and-atomic-mass/lat</a></p>	<p style="text-align: center;">Lesson Quiz:  Isotopes and Ions</p>	
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	<p><b>Element Ions</b></p> <p><b>Finding information on the periodic table</b></p> <p><b>Organization of the Periodic Table: Groups and Periods, Metals, Non-metals, and Metalloids</b></p>	<p><b>Use the periodic table to obtain the following information about the atom of an element: symbol, atomic number, atomic mass. (DOK 2)</b></p> <p><b>Describe the organization of the periodic table in terms of atomic number, metals, vs. nonmetals, and groups vs. periods. (DOK 2)</b></p> <p><b>Use basic information provided for an element (atomic mass, atomic number, symbol, and name) to determine its place on the periodic table. (DOK 2)</b></p> <p><b>Recognize that the number of electrons in the outermost energy level determines an element's chemical properties or chemical reactivity. (DOK 2)</b></p>	<p><a href="#">est/isotopes-and-atomic-mass_en.html</a></p>	<p><b>Lesson Quiz: Locating Element Information on the Periodic Table</b></p> <p><b>Lesson Quiz: Metals, Non-metals, and Metalloids</b></p> <p><b>Lesson Quiz: Groups of the Periodic Table</b></p>	
<p>4.b 9/9- 9/13</p>	<p><b>Characteristics of Metals, Non-metals, and Metalloids</b></p>	<p><b>Elements are classified as metals, nonmetals, and metalloids,</b></p>	<p><b>Physical Science Practice e-book</b> Properties of Metals and Nonmetals, p. 70</p>	<p><b>Lesson Quiz: Characteristics of Metals</b></p>	

		Classify a given element as metal, nonmetal, or metalloid based on its position in the periodic table. (DOK 2)	Periodic Table Puzzle, p.72  <b>Chem4Kids--Metals</b> <a href="http://www.chem4kids.com/files/elemental.html">http://www.chem4kids.com/files/elemental.html</a>  <b>CK-12--Metalloids</b> Reading, Video, and Practice <a href="https://www.ck12.org/c/physical-science/metalloids/">https://www.ck12.org/c/physical-science/metalloids/</a>		
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## SOL PS.5

The student will investigate and understand that energy is conserved. Key ideas include:

PS.5 SOL's	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th grade SOL's
5.a 12/2- 12/6	<b>Energy Forms</b>  <b>Kinetic and Potential Energy</b>  <b>Energy Transformations (Potential and Kinetic).</b>	<b>Energy can be stored in different ways.</b>  <b>Identify and give examples of common forms of energy. (DOK 1)</b>  <b>Recognize examples of energy causing change. (DOK 1)</b>  <b>Differentiate between kinetic and potential energy. (DOK 2)</b>  <b>Plan and carry out observational and/or experimental investigations related to transformations of kinetic and potential energy. (DOK 4)</b>	<b>YouTube Video: "Introduction to Physics" Frank Gregorio</b> <a href="https://www.youtube.com/watch?v=PUZkE1vlyvI">https://www.youtube.com/watch?v=PUZkE1vlyvI</a> Δ  <b>ESS--States and Forms of Energy</b>  <b>PBS Learning Media NOVA video: "Energy Defined"</b> <a href="https://www.pbslearningmedia.org/resource/nvel_sci.phy.defined/energy-defined/">https://www.pbslearningmedia.org/resource/nvel_sci.phy.defined/energy-defined/</a>  <b>SAMS: Heat and Light from Electricity (96)</b> <a href="https://itsi.portal.concord.org/browse/eresources/96">https://itsi.portal.concord.org/browse/eresources/96</a>		

		<p>Generate, analyze, and interpret data in tables, graphs, charts, diagrams and/or other displays to compare relative amounts of potential and kinetic energy. (DOK 3)</p> <p>Construct and use models to show that different amounts of potential energy are stored in the system when the arrangement of objects interacting at a distance changes. (DOK 2)</p>	<p><b>Physical Science Practice e-book</b> Potential and Kinetic Energy, p.29</p> <p><b>BrainPop:</b> Kinetic Energy, Potential Energy <a href="https://www.youtube.com/watch?v=8qmSzMwTkpk">https://www.youtube.com/watch?v=8qmSzMwTkpk</a></p> <p><b>YouTube:</b> SciShow “What Is Energy?” <a href="https://www.youtube.com/watch?v=CW0_S5YpYVo">https://www.youtube.com/watch?v=CW0_S5YpYVo</a></p> <p><b>YouTube:</b> Wile E Coyote “Potential and Kinetic Energy” <a href="https://www.youtube.com/watch?v=Jnj8mc04r9E">https://www.youtube.com/watch?v=Jnj8mc04r9E</a></p> <p><b>YouTube:</b> Bill Nye “Energy”,</p> <p><b>Phet: Energy Forms and Changes</b> <a href="https://phet.colorado.edu/en/simulation/energy-forms-and-changes">https://phet.colorado.edu/en/simulation/energy-forms-and-changes</a></p>		
5.b 12/9-1 2/13	<b>Convection, Conduction, and Radiation</b>	<p><b>Energy is transferred and transformed.</b></p> <p>Plan and carry out experimental and/or observational investigations to provide evidence that energy can be transferred and transformed between its different forms. (DOK 4)</p> <p>Identify the energy transformations that occur when energy is used to run a device at home or in school. (DOK 1)</p> <p>Identify the energy transformations that occur between radiant energy</p>	<p><b>NASA Real WorldNASA e-lipse video--</b>”Law of Conservation of Energy” <a href="http://www.physics4kids.com/files/motion_energy.html">http://www.physics4kids.com/files/motion_energy.html</a></p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding--</b> Chapter 6 Understanding Pressure (lab station activities)</p> <p><b>PBS Learning Media:</b> “Energy in a Roller Coaster Ride” <a href="https://www.pbslearningmedia.org/resource/hew06_sci_phys_maf_rollercoaster/energy-in-a-roller-c">https://www.pbslearningmedia.org/resource/hew06_sci_phys_maf_rollercoaster/energy-in-a-roller-c</a></p>		

		<p><b>in sunlight and the food we eat. (Photosynthesis) (DOK 3)</b></p> <p><b>Design an investigation from a testable question related to energy transfer through conduction, convection, and radiation. (DOK 4)</b></p> <p><b>Generate, analyze, and interpret data in graphs, charts, diagrams, and/or other displays related to thermal energy transfer through conduction, convection, and radiation. (DOK 3)</b></p> <p><b>Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. (DOK 4)</b></p> <p><b>Compare and contrast Celsius and Kelvin temperature scales and use them to describe absolute zero. (DOK 2)</b></p> <p><b>Explain absolute zero in terms of molecular movement (kinetic energy). (DOK 2)</b></p> <p><b>Use scientific principles to explain the function of a thermometer. (DOK 2)</b></p> <p><b>Analyze a time/temperature graph of a phase change to determine the temperature at which the phase</b></p>	<p><a href="#">oaster-ride/#.Wz5Eo9JKjIU</a>  Video: "Energy Transfer in a Trebuchet"  <a href="https://www.pbslearningmedia.org/resource/hew06.sci.phys.maf.trebuchet/energy-transfer-in-a-trebuchet/?#.Wz5FdNJKjIU">https://www.pbslearningmedia.org/resource/hew06.sci.phys.maf.trebuchet/energy-transfer-in-a-trebuchet/?#.Wz5FdNJKjIU</a></p>		
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		<p><b>change occurs. (freezing point, melting point, or boiling point.) (DOK 3)</b></p>			
<p>5.c 12/9- 12/13</p>		<p><b>Energy can be transformed to meet societal needs.</b></p> <p><b>Ask questions and define problems related to electrical energy production in Virginia. (DOK 2)</b></p> <p><b>Describe energy systems to include transformations in nature and those that are used to meet societal needs. (DOK 2)</b></p> <p><b>Evaluate and use credible, accurate, and unbiased sources of print and electronic media to gather and summarize scientific and technical information to describe that energy and fuels (fossil, renewable, and nuclear) are derived from natural resources and their uses affect the environment. (DOK 1)</b></p>			

## SOL PS.6

The student will investigate and understand that waves are important in the movement of energy. Key ideas include:

PS.6 SOL's	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th grade SOL's
6.a 1/6- 1/10		<p><b>Energy may be transferred in the form of longitudinal and transverse waves</b></p> <p><b>Describe the role of waves in transferring energy. (DOK 1)</b></p> <p><b>Explain the relationship between frequency and wavelength. (DOK 2)</b></p> <p><b>Construct and use models and simulations to represent waves that includes how the amplitude of a wave is related to its energy. (DOK 3)</b></p> <p><b>Model a longitudinal (compression) wave and diagram, label, and describe the components: wavelength, compression, rarefaction, and frequency. (DOK 2)</b></p> <p><b>Model a transverse wave and diagram, label and describe the components: wavelength,</b></p>	<p><b>BrainPop:</b> Sound, Waves</p> <p><b>YouTube Video:</b> Crash Course Physics--"Traveling Waves" <a href="https://www.youtube.com/watch?v=TfYcNvNnFU">https://www.youtube.com/watch?v=TfYcNvNnFU</a></p> <p><b>Longitudinal and Transverse Wave Animation.</b> <a href="https://www.acs.psu.edu/drussell/Demos/waves/wavemotion.html">https://www.acs.psu.edu/drussell/Demos/waves/wavemotion.html</a></p> <p><b>Physical Science Practice e-book</b> Wave Diagram, p.35 Wave Velocity Calculations, p.36</p> <p><b>Interactive Notebook--Physical Science</b> Characteristics of Waves, p.39 Kinds of Waves, p.41 Sound Properties, p.47</p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding-- Chapter 9</b> Understanding Sound (lab station)</p>	<p><b>Lesson Quiz: Characteristics of Sound Waves</b></p>	

		<p>amplitude, frequency, crest, and trough. (taught with PS.7.a)</p> <p>Compare and contrast longitudinal and transverse waves and their characteristics. (DOK 2)</p> <p>Plan and carry out investigations related to the refraction reflection, and diffraction of longitudinal and transverse waves. (DOK 4)</p>	<p>activities)</p> <p><b>pHet:</b> Wave On a String Simulation  <a href="https://phet.colorado.edu/en/simulation/wave-on-a-string">https://phet.colorado.edu/en/simulation/wave-on-a-string</a>          With accompanying lab sheet  <a href="https://phet.colorado.edu/services/download-ser-vlet?filename=%2Factivities%2F4541%2Fphet-contribution-4541-8058.pdf">https://phet.colorado.edu/services/download-ser-vlet?filename=%2Factivities%2F4541%2Fphet-contribution-4541-8058.pdf</a></p>		
<p>6.b 1/6- 1/10</p>		<p><b>Mechanical waves need a medium to transfer energy;</b></p> <p>Develop and use a model to describe that mechanical waves and reflected, absorbed, or transmitted through various materials. (DOK 2)</p> <p>Design an investigation related to sound. The investigation may be complete experimental design or may focus on systematic observation, description, measurement, and/or data collection and analysis. (DOK 4)</p> <p>Interpret graphs and charts to determine factors that determine the speed of sound through various materials. (DOK 2)</p>	<p><b>PBS Learning Media:</b> “Sound Waves Underwater: True or False” interactive quiz.  <a href="https://www.pbslearningmedia.org/resource/phy03_sci_phys_mfe_under/sound-waves-underwater-true-or-false/#.Wz5LKNJKjIU">https://www.pbslearningmedia.org/resource/phy03_sci_phys_mfe_under/sound-waves-underwater-true-or-false/#.Wz5LKNJKjIU</a></p> <p>“The Speed of Sound”  <a href="https://www.pbslearningmedia.org/resource/47c8d6ce-958f-4558-bd25-0c29502902e5/47c8d6ce-958f-4558-bd25-0c29502902e5/">https://www.pbslearningmedia.org/resource/47c8d6ce-958f-4558-bd25-0c29502902e5/47c8d6ce-958f-4558-bd25-0c29502902e5/</a></p> <p><b>pHet:</b> Wave On a String Simulation  <a href="https://phet.colorado.edu/en/simulation/wave-on-a-string">https://phet.colorado.edu/en/simulation/wave-on-a-string</a>          With accompanying lab sheet  <a href="https://phet.colorado.edu/services/download-ser-vlet?filename=%2Factivities%2F4541%2Fphet-contribution-4541-8058.pdf">https://phet.colorado.edu/services/download-ser-vlet?filename=%2Factivities%2F4541%2Fphet-contribution-4541-8058.pdf</a></p>	<p>Lesson Quiz: Sound Waves and Mediums</p>	

		Identify the property of sound waves that corresponds to loudness. (DOK 1)			
6.c 1/13- 1/17		<p><b>Waves can interact</b></p> <p>Identify examples illustrating interference and/or resonance of transverse or longitudinal waves. (DOK 1)</p>	<p><b>Phet: Wave Interference (waves, interference, slits)</b></p> <p><a href="https://phet.colorado.edu/sims/html/wave-interference/latest/wave-interference_en.html">https://phet.colorado.edu/sims/html/wave-interference/latest/wave-interference_en.html</a></p>		
6.d 1/13- 1/17		<p><b>Energy associated with waves has many applications.</b></p> <p>Evaluate and use credible, accurate, and unbiased sources of print and electronic media to gather and summarize scientific and technical information about technological applications of sound and water waves and generally how each application functions. (DOK 1)</p>			

## SOL PS.7

The student will investigate and understand that waves are important in the movement of energy. Key ideas include:

PS.7 SOL's	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments	6th grade SOL's
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<p>7.a 1/21- 1/24</p>	<p><b>Modeling a Transverse Wave</b></p> <hr/> <p><b>Types of Electromagnetic Waves</b></p> <hr/>	<p><b>Electromagnetic radiation, including visible light has wave characteristics and behavior.</b></p> <p><b>Model a transverse wave and diagram, label and describe the components: wavelength, amplitude, frequency, crest, and trough. (PS.6.a) (DOK 2)</b></p> <p><b>Describe the wave behavior of visible light. (DOK 1)</b></p> <hr/> <p><b>Compare and contrast the various types of electromagnetic waves in terms of wavelength, frequency, and energy. (DOK 2)</b></p> <hr/>	<p><b>ESS--Light and the Electromagnetic Spectrum</b></p> <p>Online image:  <a href="https://www.google.com/search?q=electromagnetic+spectrum&amp;source=lnms&amp;tbm=isch&amp;sa=X&amp;ved=0ahUKEwjXzb7EysHbAhVRuVkkKHV78A7cQ_AUI CigB&amp;biw=1366&amp;bih=662&amp;safe=active&amp;ssui=on#imgrc=yYWwmoFv0tUrpM">https://www.google.com/search?q=electromagnetic+spectrum&amp;source=lnms&amp;tbm=isch&amp;sa=X&amp;ved=0ahUKEwjXzb7EysHbAhVRuVkkKHV78A7cQ_AUI CigB&amp;biw=1366&amp;bih=662&amp;safe=active&amp;ssui=on#imgrc=yYWwmoFv0tUrpM</a>  :</p> <p><b>BrainPop:</b> Light</p> <p><b>Interactive Notebook--Physical Science</b>  Light, p.43</p> <p><b>YouTube video:</b> "The History of Light"  <a href="https://www.youtube.com/watch?v=ak7GB74Qlug">https://www.youtube.com/watch?v=ak7GB74Qlug</a></p> <hr/> <p><b>Interactive Notebook--Physical Science</b>  Light at a Surface, p. 45</p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding-- Chapter 8</b>  Understanding Light (lab station activities)</p>	<p>Lesson Quiz:  Characteristics of Transverse Waves</p> <p><b>Lesson Quiz:</b> The Electromagnetic Spectrum</p> <p><b>Lesson Quiz:</b> Behavior of Light Waves</p>	
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		<p><b>Plan and carry out investigations related to the refraction of visible light. (DOK 4)</b></p>		
7.b 2/3- 2/7		<p><b>Regions of the electromagnetic spectrum have specific characteristics and uses.</b></p> <p><b>Identify and explain in general terms the uses of mirrors and lenses in everyday life. (DOK 2)</b></p> <p><b>Describe an everyday application of each of the major forms of electromagnetic energy. (DOK 1)</b></p>	<p><b>pHet Simulation “Bending Light”</b>  <a href="https://phet.colorado.edu/en/simulation/bending-light">https://phet.colorado.edu/en/simulation/bending-light</a>  <b>with worksheet</b>  <a href="https://phet.colorado.edu/en/contributions/view/4316">https://phet.colorado.edu/en/contributions/view/4316</a></p> <p><b>Physical Science Practice e-book</b>  Reflection, p. 37  Refraction, p.38  Scientific Notation, p.11</p> <p><b>Physical Science Practice e-book</b>  Light Rays and Convex Lenses, p.40</p> <p><b>YouTube Videos: “Convex and Concave Lenses”</b>  <a href="https://www.youtube.com/watch?v=4zuB_dSJn1Y">https://www.youtube.com/watch?v=4zuB_dSJn1Y</a>  <b>“Convex and Concave Mirrors”</b>  <a href="https://www.youtube.com/watch?v=vwYduTBpbuA">https://www.youtube.com/watch?v=vwYduTBpbuA</a></p>	
			<p><b>ESS--Light and the Electromagnetic Spectrum</b></p> <p><b>BrainPop: Electromagnetic Spectrum</b></p> <p><b>Physics4Kids website--Light Overview (with interactive quiz)</b>  <a href="http://www.physics4kids.com/files/light_intro.html">http://www.physics4kids.com/files/light_intro.html</a></p> <p><b>Science at NASA video--”Tour the EM Spectrum</b>  <a href="http://www.physics4kids.com/files/light_emtyp">http://www.physics4kids.com/files/light_emtyp</a></p>	

			<p><a href="#">e.html</a></p> <p><b>PBS NOVA:</b> “Electromagnetic Spectrum Tour” interactive  <a href="http://www.pbs.org/wgbh/nova/physics/electromagnetic-spectrum.html">http://www.pbs.org/wgbh/nova/physics/electromagnetic-spectrum.html</a></p> <p><b>Physics4Kids website--EM</b>  Radiation (with interactive quiz)  <a href="http://www.physics4kids.com/files/light_emtyp_e.html">http://www.physics4kids.com/files/light_emtyp_e.html</a></p> <p><b>Physical Science Practice e-book</b>  White Light Spectrum, p.42  Light Matching, p.43</p>		
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**SOL PS.8**  
The student will investigate and understand that work, force, and motion are related. Key ideas include:

PS.8 SOL's	Lesson Title	Essential Knowledge and Skills	Resources and Materials	Assessments
8.a 2/24- 2/28		<p><b>Motion can be described using position and time</b></p> <p><b>Apply the concept of frame of reference to motion scenarios. (DOK 2)</b></p>	<p><b>ESS--Work and Power</b></p> <p><b>Physical Science Practice e-book</b>  Determining Speed, p.15  Calculating Average Speed, p.16  Acceleration Calculations, p.17</p>	

		<p>Apply the concepts of speed, velocity, and acceleration when describing motion. (DOK 2)</p> <p>Compare the speed of two or more objects. (DOK 2)</p> <p>Develop hypotheses, identify constants, variables, and apply repeated trials when conducting experimental investigations related to motion. (DOK 3)</p> <p>Make measurements and apply mathematical and computational thinking to calculate and analyze speed, velocity, and acceleration. (DOK 2)</p> <p>Generate, analyze, and interpret data in tables, graphs, charts, diagrams, models, equations, and/or other displays related to motion. (DOK 3)</p> <p>Construct and use models and simulations to represent and/or explain motion. (DOK 2)</p>	<p>Graphing Speed vs. Time, p.18  Graphing Distance vs. Time, p.19  Force Diagrams, p.22  Force and Acceleration, p.23  Motion Matching, p.24  Calculating Work, p.30  Calculating Power, p.33  Force and Work Crossword, p.34</p>	
<p>8.b  3/2-  3/6</p>		<p><b>Motion is described by Newton's Laws</b></p> <p>Critique and improve an investigation about forces. (DOK 4)</p> <p>Plan and carry out an investigation to</p>	<p><b>ESS--Work and Power</b></p> <p><b>ESS--The Rate of Motion</b></p>	

	<p><b>provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (DOK 4)</b></p> <p><b>Develop hypotheses, identify constants, variables, and apply repeated trials when conducting experimental investigations related to motion. (DOK 3)</b></p> <p><b>Make measurements and apply mathematical and computational thinking to calculate and analyze speed, velocity, and acceleration. (DOK 2)</b></p> <p><b>Generate, analyze, and interpret data in tables, graphs, charts, diagrams, models, equations, and/or other displays related to motion. (DOK 3)</b></p> <p><b>Construct and use models and simulations to represent and/or explain motion. (DOK 2)</b></p> <p><b>Critique and improve an investigation about forces. (DOK 4)</b></p> <p><b>Plan and carry out an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (DOK 4)</b></p> <p><b>Differentiate between mass and</b></p>		
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	<p><b>weight. (DOK 2)</b></p> <p><b>Plan and carry out investigations related to mass and weight, collecting and analyzing data in metric and SI units where appropriate. (DOK 4)</b></p> <p><b>Identify situations that illustrate each of Newton's Laws of Motion. (DOK 1)</b></p> <p><b>Apply an understanding of scientific principles and laws to describe and predict motion. (DOK 2)</b></p> <p><b>Construct and use models and simulations to represent and/or explain Newton's Laws of Motion. (DOK 2)</b></p> <p><b>Design and conduct an investigation regarding Newton's Second Law of Motion to show the relationship among force, mass, and acceleration.(DOK 4)</b></p> <p><b>Explain how force, mass, and acceleration are related. (DOK 2)</b></p> <p><b>Apply Newton's Third Law of Motion to design a solution to a problem involving the motion of two colliding objects. (DOK 2)</b></p> <p><b>State the direction of motion after the interaction of two objects. (DOK 1)</b></p>		
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		<p><b>Explain how the concept of work, force, and motion apply to everyday uses and current technologies. (DOK 2)</b></p> <p><b>Recognize the direction of the force of friction. (DOK 1)</b></p> <p><b>Explain why force must continually be exerted to keep an object sliding across a carpeted surface. (DOK 2)</b></p> <p><b>Recognize examples of mechanical work. (DOK 1)</b></p> <p><b>Apply mathematical and computational thinking to solve basic problems related to work. (DOK 2)</b></p> <p><b>Make measurements and apply mathematical and computational thinking to calculate the power of an object. (DOK 2)</b></p> <p><b>Apply the concept of efficiency to simple machines. (DOK 2)</b></p> <p><b>Apply the concept of mechanical advantage to simple machines. (DOK 2)</b></p> <p><b>Use models to illustrate and explain concepts related to work, power,</b></p>		
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		<p><b>mechanical advantage, and efficiency. (DOK 2)</b></p>		
			<p><b>ESS--Work and Power</b></p> <p><b>Glencoe Simulation: “What is the Relationship Between Work, Force, and Distance” Virtual Lab</b>  <a href="http://www.glencoe.com/sites/common_assets/science/virtual_labs/E13/E13.html">http://www.glencoe.com/sites/common_assets/science/virtual_labs/E13/E13.html</a></p> <p><b>NASA e-clips video--”Our World: What is Work?”</b>  <a href="http://www.physics4kids.com/files/motion_work.html">http://www.physics4kids.com/files/motion_work.html</a></p> <p><b>Physics4Kids website--Work (with interactive quiz)</b>  <a href="http://www.physics4kids.com/files/motion_work.html">http://www.physics4kids.com/files/motion_work.html</a></p> <p><b>BrainPop: Work, Power, Levers</b></p> <p><b>Physical Science Practice e-book</b>  Simple Machines, p.27  Types of Levers, p.28</p> <p><b>Interactive Notebook--Physical Science</b>  Work, 29  Simple Machines, p.33</p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding--</b>  Chapter 7 Understanding Work and Energy (lab station activities)</p>	

## SOL PS.9

The student will investigate and understand that there are basic principles of electricity and magnetism. Key ideas include:

PS.9 SOL's	Lesson Title	Essential Knowledge and skills	Resources and Materials	Assessment	6th grade SOL
9.a 3/30- 4/3	<b>Static Electricity</b>	<b>An imbalance of charge generates static electricity.</b>  <b>Model the transfer of electrons that result in a static charge. (DOK 2)</b>	<b>ESS--Electricity and Circuits</b>  <b>Uncovering Student Ideas in Physical Science, vol.2</b> "What Happens When You Bring a Balloon Near a Wall?" p.27  <b>BrainPop:</b> Static Electricity  <b>Interactive Notebook--Physical</b>	<b>Lesson Quiz:</b> <b>Static Electricity</b>	

			<p><b>Science</b> Static Electricity, p.51</p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding-- Chapter 4</b> Understanding Static Electricity and Magnetism (lab station activities)</p> <p><b>YouTube</b> video: "Bill Nye --Static Electricity" <a href="https://www.youtube.com/watch?v=6DG7kH8Ts1M&amp;t=1176s">https://www.youtube.com/watch?v=6DG7kH8Ts1M&amp;t=1176s</a></p>		
9.b 4/1- 4/3		<p><b>Materials have different conductive properties.</b></p> <p>Provide examples of materials that are good conductors, semiconductors, and insulators. (DOK 1)</p> <p>Apply scientific principles and the engineering process to use a battery, several wires, and a bulb to determine if an object is an electrical conductor or insulator. Create a model to help explain your solution. (DOK 2)</p>	<p><b>Uncovering Student Ideas in Physical Science, vol.2</b> "Can It Be Electrically Charged?" p.23</p> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b> "Conductors or Insulators?", p.31</p>	Lesson Quiz: Conductors, Semi-Conductors, and Insulators	
9.c 4/6- 4/10	<b>Electrical Circuits</b>	<b>Electric circuits transfer energy.</b>	<p><b>ESS--Electricity and Circuits</b></p> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b> "How Can You Light the Bulb?"</p>	Lesson Quiz: Electrical Circuits	

		<p><b>Construct simple series and parallel circuits to determine the relationship between voltage, resistance, and current. (DOK 2)</b></p> <p><b>Define and recognize examples of voltage, current, and resistance in electric circuits. (DOK 1)</b></p> <hr/> <p><b>Describe the energy flow and transformation in a circuit containing a power source and no more than three loads. (DOK 2)</b></p> <hr/> <p><b>Discuss the advantages of electronic over electrical circuits. (DOK 2)</b></p> <hr/> <p><b>Evaluate and use credible, accurate, and unbiased sources of print and electronic</b></p>	<p>P.59</p> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b>  “Which Burns Brighter?” p.75</p> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b>  “How Would You Rank the Brightness of These Bulbs?” p.79</p> <p><b>BrainPop:</b> Electricity, Electrical Circuits</p> <p><b>TOPS:</b> p.1 “It Works!”  P.2 “To Light or Not to Light”</p> <hr/> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b>  “How Do You Think About the Flow of Electric Current Through a Circuit?”, p.67</p> <p><b>Uncovering Student Ideas in Physical Science, vol.2</b>  “How Does the Current in Each Battery Compare?” p.83</p>		
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		<p>media to gather and summarize scientific and technical information about current applications of semiconductors and their uses. (e.g. diodes and transistors). (DOK 1)</p>	<hr/> <p><b>Physics4Kids website--</b>"Electricity Overview" (with interactive quiz)  <a href="http://www.physics4kids.com/files/elec_intro.html">http://www.physics4kids.com/files/elec_intro.html</a></p> <p><b>Interactive Notebook--Physical Science</b>  Electricity, p.49</p> <p><b>Predict, Observe, Explain: Activities Enhancing Scientific Understanding-- Chapter 5</b>  Understanding Current Electricity (lab station activities)</p> <p><b>ScienceFlix</b> "The Nature of Electricity" article  <a href="https://sdm-sfx.digital.scholastic.com/popsci_article/4013900/0ta/nbps&amp;queryText=electricity&amp;docKey=bmJwcy9wcm9kdWN0LzQwMTM5MDAuaHRtbA**?authCtx=U.600103231">https://sdm-sfx.digital.scholastic.com/popsci_article/4013900/0ta/nbps&amp;queryText=electricity&amp;docKey=bmJwcy9wcm9kdWN0LzQwMTM5MDAuaHRtbA**?authCtx=U.600103231</a></p> <p>Need to create a GoogleForm assessment to accompany.</p> <p><b>Circuit Globe: Difference Between Electrical and Electronic Devices</b>  <a href="https://circuitglobe.com/difference-between-electrical-and-electronic-devices.html">https://circuitglobe.com/difference-between-electrical-and-electronic-devices.html</a></p>		
9.d 4/13- 4/17		<p><b>Magnetic fields model the magnetic properties of materials</b></p>	<p><b>BrainPop:</b> Magnetism</p> <p><b>Physics4Kids website--NASA</b>  Connect video "Electricity and</p>		

		<p>Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (DOK 4)</p>	<p>Magnetism”</p> <p>Physics4Kids website--”Current”  <a href="http://www.physics4kids.com/files/elec_curr.html">http://www.physics4kids.com/files/elec_curr.html</a></p> <p>Physical Science Practice e-book  Magnetic Fields, p.44</p> <p>Interactive Notebook--Physical Science  Magnetism, p.59  Electromagnetism, p.61</p>	<p>Uncovering Student Ideas in Physical Science, vol.2 “What Happens When You Bring a Compass Near a Current-Carrying Wire? p.179</p>	
<p>9.e  4/13-  4/17</p>		<p>Electric current and magnetic fields are related.</p> <p>Identify technologies that utilize electromagnetism. (DOK 1)</p> <p>Apply an understanding of electromagnetic induction to explain the current produced when a coil of wire is moved through a magnetic field. (DOK 2)</p> <hr/> <p>Plan and conduct an investigation to determine the factors that affect the strength of electric and magnetic</p>	<p>Phet: Charges and Fields  <a href="https://phet.colorado.edu/en/simulation/legacy/charges-and-fields">https://phet.colorado.edu/en/simulation/legacy/charges-and-fields</a></p> <p>Phet: Relationship Between Electricity and Magnetism Lab  <a href="https://phet.colorado.edu/en/contributions/view/4216">https://phet.colorado.edu/en/contributions/view/4216</a></p>	<hr/> <p>Uncovering Student Ideas in Physical Science, vol.2  “How Can You Make a Stronger Electromagnet?”  p.175</p>	

		<p><b>forces.(DOK 4)</b></p> <p><b>Plan and conduct an investigation to determine the factors that affect the strength of electric and magnetic forces. (DOK 4)</b></p> <hr/> <p><b>Compare and contrast generators and motors and how they function. (DOK 2)</b></p> <p><b>Identify technologies that utilize electromagnetism. (DOK 1)</b></p> <p><b>Apply an understanding of electromagnetic induction to explain the current produced when a coil of wire is moved through a magnetic field. (DOK 3)</b></p> <p><b>Plan and conduct an investigation to determine the factors that affect the strength of electric and magnetic forces. (DOK 4)</b></p>		<hr/>	
<p>9.f 4/20- 4/24</p>		<p><b>Many technologies use electricity and magnetism.</b></p> <p><b>Compare and contrast generators and motors and</b></p>			

		<b>how they function. (DOK 3)</b> <b>Identify everyday appliances and technologies that utilize motors and generators. (DOK 1)</b>			
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**April 27 through May 15 will be Review and SOL prep.**