

Grade Curriculum Map for Grade4  
Instructional Plan for FOSS Science *(+added investigations and performance tasks)*  
Steve Lehman  
St. Paul's Lutheran School  
Revised: June 2021

**Grade 4 Curriculum  
Instructional Plan for FOSS Science  
Written by Steve Lehman  
June 2021**

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	Content Type	Objectives	Standards	Assessment	Materials
<b>AUGUST &amp; SEPTEMBER</b>	<ul style="list-style-type: none"> <li>● 24</li> <li>● FOSS</li> </ul> Insects and Plants Module	Investigation 1-SWBAT: <ul style="list-style-type: none"> <li>● describe and compare seed properties.</li> <li>● investigate and articulate the effect water has on seeds by setting up seed sprouters and observing and recording changes over a week.</li> <li>● investigate seed dispersal mechanisms of plants.</li> </ul> Investigation 2-Growing Further SWBAT <ul style="list-style-type: none"> <li>● examine germinated seeds to determine similarities and differences in the way the organisms grow.</li> <li>● set up a hydroponic garden to observe the life cycle of a bean pant.</li> <li>● learn about plant structures and functions through direct experience and readings.</li> </ul>	<ul style="list-style-type: none"> <li>● a. identifies something as living (I.e. eats, grows, reproduces) or nonliving.</li> <li>● b. knows that animals depend on plants, and plants depend on animals</li> <li>● (e.g. respiration, food webs/food chains).</li> <li>● c. recognizes that some animals claim a territory that they protect from other animals.</li> <li>● d. defines a habitat as where an animal lives.</li> <li>● e. defines behavior as what an animal does.</li> <li>● f. observes and describes how an organism's behavior and/or adaptations help survive in a changing environment</li> <li>● g. selects and safely uses equipment relevant to the science investigation.</li> </ul>	<ul style="list-style-type: none"> <li>● Diagnostic assessments</li> <li>● Formative assessments</li> <li>● Summative assessments</li> <li>● Ipsative assessments</li> <li>● Norm-referenced assessments</li> <li>● Criterion-referenced assessments</li> </ul>	NSTA Resources and Lesson Plans: <a href="http://ngss.nsta.org/DisplayStandard.aspx?view=topic&amp;id=32">http://ngss.nsta.org/DisplayStandard.aspx?view=topic&amp;id=32</a> <ul style="list-style-type: none"> <li>● Inventory of Traits:  <a href="http://teach.genetics.utah.edu/content/heredity/files/InventoryOfTraits.pdf">http://teach.genetics.utah.edu/content/heredity/files/InventoryOfTraits.pdf</a>,  <a href="http://learn.genetics.utah.edu/content/inheritance/observable/">http://learn.genetics.utah.edu/content/inheritance/observable/</a></li> <li>● Effect of Environment on Plant Growth:  <a href="http://www.apsnet.org/edcenter/K12/TeachersGuide/PlantBiotechnology/Pages/Activity7.aspx">http://www.apsnet.org/edcenter/K12/TeachersGuide/PlantBiotechnology/Pages/Activity7.aspx</a></li> <li>● Mutations and Variations:  <a href="http://www.coseewest.org/AprilLectureMaterials/Activities/Mutations&amp;Variation.pdf">http://www.coseewest.org/AprilLectureMaterials/Activities/Mutations&amp;Variation.pdf</a></li> <li>● Reproduction Lesson:  <a href="http://ca.pbslearningmedia.org/resource/tdc02.sci.life.repro.lp_reproduce/reproduction/">http://ca.pbslearningmedia.org/resource/tdc02.sci.life.repro.lp_reproduce/reproduction/</a></li> <li>● Human Traits</li> <li>● <a href="https://drive.google.com/drive/folders/0ByFBd0Ins-tSYTRsSU5Oc0tVRFE">https://drive.google.com/drive/folders/0ByFBd0Ins-tSYTRsSU5Oc0tVRFE</a></li> </ul>
<b>OCTOBER</b>	20 <ul style="list-style-type: none"> <li>● FOSS</li> </ul> Insects and Plants Module Investigation 1- Meet the Crayfish	SWBAT <ul style="list-style-type: none"> <li>● observe and record some of the structures of crayfish and</li> <li>● compare them to other organisms,</li> <li>● investigate crayfish behavior. collect data and observe adaptations of organisms</li> <li>● engage in a simulation activity to explore food chains.</li> </ul>	<ul style="list-style-type: none"> <li>● a. describe how plants and animals respond to changes in their environment.</li> <li>● b. describes that seeds are living organisms that have a variety of properties and undergo changes in the presence of water.</li> <li>● c. recognizes that a seed contains the embryo plant and stores food and water.</li> <li>● d. identifies that animals have senses that help them to detect internal and external cues (e.g. students can recognize that when an animal is hungry, it eats; when it is thirsty, it drinks, when it is tired, it sleeps, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>● Diagnostic assessments</li> <li>● Formative assessments</li> <li>● Summative assessments</li> <li>● Ipsative assessments</li> <li>● Norm-referenced assessments</li> </ul>	Inherited Traits in Animals: <ul style="list-style-type: none"> <li>● <a href="http://cals.arizona.edu/fps/sites/cals.arizona.edu/fps/files/education/juniors_tre_e.pdf">http://cals.arizona.edu/fps/sites/cals.arizona.edu/fps/files/education/juniors_tre_e.pdf</a></li> <li>● What Made a Giraffe Decide to be Tall  <a href="https://api.betterlesson.com/mtp/lesson/629946/print">https://api.betterlesson.com/mtp/lesson/629946/print</a></li> <li>● What does the Walrus do when the Ice is Gone?</li> </ul>

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		<p>Investigation 2-Human Body          SWBAT</p> <ul style="list-style-type: none"> <li>● observe the articulated human skeletal system in action.</li> <li>● explore joints and their role in movement</li> <li>● build operational models of muscle–bone systems to see how muscles move bones.</li> <li>● investigate their skin by gathering and analyzing fingerprint patterns.</li> </ul>	<ul style="list-style-type: none"> <li>● selects a variety of resources that best answer questions and plan investigations. b. recognizes that there are multiple sources of information to answer questions that could include textbooks, computers, science speakers, reference books, peers, or field trips. c. distinguishes which of the resources are appropriate to use and which are not.</li> </ul>	<ul style="list-style-type: none"> <li>● Criterion-referenced assessment</li> </ul>	<p><a href="https://api.betterlesson.com/mtp/lesson/629946/print">https://api.betterlesson.com/mtp/lesson/629946/print</a></p> <ul style="list-style-type: none"> <li>● Colorful Clams  <a href="https://betterlesson.com/lesson/630994/colorful-clams">https://betterlesson.com/lesson/630994/colorful-clams</a></li> <li>● Animals that can't adapt</li> <li>● <a href="https://betterlesson.com/lesson/631920/vanishing-vaquita-in-the-sea-of-cortez">https://betterlesson.com/lesson/631920/vanishing-vaquita-in-the-sea-of-cortez</a></li> <li>● Fish of the Same Species with different traits  <a href="https://betterlesson.com/lesson/627426/fish-vertebrates-of-the-sea">https://betterlesson.com/lesson/627426/fish-vertebrates-of-the-sea</a></li> <li>● Awesome Bird Traits  <a href="https://betterlesson.com/lesson/627509/awesome-bird-traits">https://betterlesson.com/lesson/627509/awesome-bird-traits</a></li> <li>● What can we learn from a bird dog</li> <li>● <a href="https://betterlesson.com/lesson/resource/3174805/bear-dogs-readingpassage">https://betterlesson.com/lesson/resource/3174805/bear-dogs-readingpassage</a></li> <li>● Interpreting Fossil Records  <a href="https://api.betterlesson.com/mtp/lesson/635846/print">https://api.betterlesson.com/mtp/lesson/635846/print</a></li> <li>● How Our Land has Changed over Time  <a href="https://api.betterlesson.com/mtp/lesson/638823/print">https://api.betterlesson.com/mtp/lesson/638823/print</a></li> <li>● Make a fossil model  <a href="http://serc.carleton.edu/sp/mnstep/activities/27092.html">http://serc.carleton.edu/sp/mnstep/activities/27092.html</a></li> <li>● What can fossils tell us about organisms and environments long ago?            Video Intro:</li> </ul>
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	<b>Content Type</b>	<b>Objectives</b>	<b>Standards</b>	<b>Assessment</b>	<b>Materials</b>
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# Grade Curriculum Map for Grade4

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<p><b>N O V E M B E R</b></p>	<ul style="list-style-type: none"> <li>• 19</li> <li>• FOSS Science Module: Pebbles, Sand, and Silt</li> </ul>	<p>Investigation 1- First Rocks SWBAT</p> <ul style="list-style-type: none"> <li>• classify, note, and differentiate the mineral portion of the planet on which they live.</li> <li>• investigate several kinds of volcanic rocks</li> <li>• begin to understand the properties of rocks.</li> <li>• observe rocks (using hand lenses), rub rocks, wash rocks, sort rocks, and describe rocks.</li> <li>• organize a class rock collection</li> <li>• learn about the properties of rocks and the colorful minerals they contain.</li> </ul> <p>Investigation 2- River Rocks SWBAT</p> <ul style="list-style-type: none"> <li>• investigate a mixture of different sized river rocks.</li> <li>• separate the rocks using a series of three screens to identify five sizes of rocks: large pebbles, small pebbles, large gravel, small gravel, and sand.</li> <li>• add water to a vial of sand to discover silt and clay.</li> <li>• observe collected data and hypothesize how sand is formed.</li> </ul>	<ul style="list-style-type: none"> <li>• a. observe and compare the properties of rocks by shape, size, color, and texture. b. understands that minerals have different properties, such as color and hardness, and are used to find out which minerals make up rock. c. describes solid rocks as earth materials that have different physical and chemical properties that make them useful in different ways.</li> <li>• a. understands that earth materials consist of rocks and soils.</li> <li>b. uses evaporation to investigate rock composition. c. explains that rocks are composed of minerals and that minerals cannot be physically separated into other materials.</li> <li>d. identifies soil as a mixture of earth materials that can vary from place to place, e.g. clay vs. sand) e. identifies examples of rocks as sandstone, limestone, marble, and granite.</li> <li>• a. asks and answers questions during the investigations. b. supports their conclusions with evidence.</li> </ul>	<p>Diagnostic assessments</p> <ul style="list-style-type: none"> <li>• Formative assessments</li> <li>• Summative assessments</li> <li>• Ipsative assessments</li> <li>• Norm-referenced assessments</li> <li>• Criterion-referenced assessment</li> </ul>	<p>Questions in the Project Folder Individual and Class Discussions Teacher Observation Student Journals Performance Assessment Tasks Data Sheets Lab Notebooks</p>
<p><b>D E C E M B E R</b></p>	<ul style="list-style-type: none"> <li>• 19</li> <li>• FOSS Science Module: Pebbles, Sand, and S</li> </ul>	<p>Investigation 3- Using Rocks SWBAT</p> <ul style="list-style-type: none"> <li>• observe and evaluate how people use earth materials to construct objects.</li> <li>• make rubbings from sandpaper, sculptures from sand, decorative jewelry from clay, and bricks from clay soil.</li> <li>• look for places where earth materials occur naturally</li> <li>• research, note, and list people have incorporated earth materials into building materials.</li> </ul> <p>Investigation 4- Soil and Water SWBAT</p> <ul style="list-style-type: none"> <li>• put together and take apart soils</li> </ul>	<ul style="list-style-type: none"> <li>• a. records and discusses observations about rocks and minerals. b. records results of investigations. [ALL FOSS Modules, i.e., Earth Materials, Take It For Granite , Pts. 1,4] c. reports the results of science investigations to different audiences (friends, teachers, and younger students) by using bar graphs, tables, and illustrations.</li> <li>• a. compares previously studied evidence, models, or current explanations with current observations to show that things change, stay the same, or follow a pattern. b. uses an acid test on a mineral. to observe a mineral's property.</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnostic assessments</li> <li>• Formative assessments</li> <li>• Summative assessments</li> <li>• Ipsative assessments</li> <li>• Norm-referenced assessments</li> <li>• Criterion-referenced assessment</li> </ul>	<p>Questions in the Project Folder Individual and Class Discussions Teacher Observation Student Journals Performance Assessment Tasks Data Sheets Lab Notebooks</p>

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J A N U A R Y	<ul style="list-style-type: none"> <li>• 21</li> <li>• FOSS Science Module:</li> </ul>	<p>Investigation 1- Forces SWBAT</p> <ul style="list-style-type: none"> <li>• Students will plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</li> <li>• Students will make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.</li> <li>• Students will ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.</li> <li>• Students will create a simple design problem that can be solved by applying scientific ideas about magnets.</li> </ul> <p>Investigation 2- Patterns of Motion SWBAT</p> <p>Students will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <ul style="list-style-type: none"> <li>• Students will generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>• Students will plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved</li> </ul>	<ul style="list-style-type: none"> <li>• a. conducts investigations to study the effect of forces upon the motion of an object. b. names the six simple machines and gives an example of each. c. investigates the uses of simple machines. d explains how simple machines can change an applied force and gives examples. e. constructs and demonstrates the use of a lever, pulley, wheel and axle gear. f. identifies variables that affect the performance of a simple machine.</li> <li>• a. identifies commonly known careers in science (e.g. doctor, astronaut, veterinarian, nurse) b. recognizes that men and women from many cultures have made contributions throughout the history of science and technology. c. identifies cultural influences that allowed scientists to make contributions to major ideas in science.</li> <li>• a. recognizes that a variety of resources can be used to answer questions and plan investigations.</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnostic assessments</li> <li>• Formative assessments</li> <li>• Summative assessments</li> <li>• Ipsative assessments</li> <li>• Norm-referenced assessments</li> <li>• Criterion-referenced assessment</li> <li>• <a href="https://dpi.wi.gov/sites/default/files/imce/science/Energy-Collision-s-Task-4th.pdf">https://dpi.wi.gov/sites/default/files/imce/science/Energy-Collision-s-Task-4th.pdf</a></li> </ul>	<p>Questions in the Project Folder Individual and Class Discussions Teacher Observation Student Journals Performance Assessment Tasks Data Sheets Lab Notebooks</p>

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<p><b>F E B R U A R Y</b></p>	<ul style="list-style-type: none"> <li>● 18</li> <li>● FOSS Science Module:</li> </ul>	<p>Investigation 3-Engineering SWBAT</p> <ul style="list-style-type: none"> <li>●.Design a car that could move as far as possible with one breath of air only using four Lifesavers, two straws, two paper clips, scissors, tape, and a sheet of paper.</li> <li>● Design and improved model of an everyday object using a magnet (example being a magnetic latch to keep a door closed)</li> <li>● Motion and Wind- See Student Recording Sheet</li> <li>● Lifesaver Model Car- scored by rubric for engineering and design</li> </ul> <p>Investigation 4-Mixtures</p>	<ul style="list-style-type: none"> <li>● a. observes and describes physical changes in matter such as change in size, shape, color, temperature, speed or direction.</li> <li>b. discusses possible causes for these changes.</li> <li>c. observes and measures temperature in degrees Celsius.</li> <li>d. compares temperatures of cooling ice over time.</li> </ul>	<ul style="list-style-type: none"> <li>● Diagnostic assessments</li> <li>● Formative assessments</li> <li>● Summative assessments</li> <li>● Ipsative assessments</li> <li>● Norm-referenced assessments</li> <li>● Criterion-referenced assessment</li> </ul>	
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M A R C H	<ul style="list-style-type: none"> <li>17 Weather and Physics</li> </ul>	<p>Investigation 1-Weather and Meteorology from a Distance SWBAT research and record data on the weather and climate in another region of the world .</p> <ul style="list-style-type: none"> <li>measure temperature, precipitation, and wind direction using weather tools.</li> <li>graph typical weather patterns for the region in which they live.</li> <li>predict weather patterns based on patterns and preview year's data.</li> </ul> <p>Investigation 2-Geoengineering and Climate Change Prevention SWBAT</p> <ul style="list-style-type: none"> <li>represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.</li> <li>obtain and combine information to describe climates in different regions of the world.</li> <li>define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> <li>generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>research and present a short presentation on a man-made solution to an environmental challenge from somewhere around the world</li> </ul>	<ul style="list-style-type: none"> <li>a. observes and describes physical changes in matter such as change in size, shape, color, temperature, speed or direction.</li> <li>discusses possible causes for these changes.</li> <li>observes and measures temperature in degrees Celsius.</li> <li>compares temperatures of cooling ice over time.</li> <li>a. selects a variety of resources that best answer questions and plan investigations.</li> <li>recognizes that there are multiple sources of information to answer questions that could include textbooks, computers, science speakers, reference books, peers, or field trips.</li> <li>distinguishes which of the resources are appropriate to use and which are not.</li> </ul>	<ul style="list-style-type: none"> <li>Diagnostic assessments</li> <li>Formative assessments</li> <li>Summative assessments</li> <li>Ipsative assessments</li> <li>Norm-referenced assessments</li> <li>Criterion-</li> </ul>	<p>Difference between weather and climate: <a href="http://www3.epa.gov/climatechange/kids/documents/weatherclimate.pdf">http://www3.epa.gov/climatechange/kids/documents/weatherclimate.pdf</a></p> <ul style="list-style-type: none"> <li>Weather vs Climate &amp; video from NatGeo <a href="https://www.ck12.org/earth-science/Weather-versusClimate/lesson/Weather-versusClimate/?referrer=concept_details">https://www.ck12.org/earth-science/Weather-versusClimate/lesson/Weather-versusClimate/?referrer=concept_details</a></li> <li>Multiple topics under weather and climate <a href="http://climatekids.nasa.gov/next-generation-standards/review/">http://climatekids.nasa.gov/next-generation-standards/review/</a></li> <li>Climate change over time <a href="http://www3.epa.gov/climatechange/kids/documents/temp-andco2.pdf">http://www3.epa.gov/climatechange/kids/documents/temp-andco2.pdf</a></li> <li>Analyzing tree rings to look at climate change over time <a href="http://www3.epa.gov/climatechange/kids/documents/treerings.pdf">http://www3.epa.gov/climatechange/kids/documents/treerings.pdf</a></li> <li>And <a href="http://climate.nasa.gov/climate_resources/25/">http://climate.nasa.gov/climate_resources/25/</a></li> <li><a href="https://api.betterlesson.com/mtp/lesson/636909/print">https://api.betterlesson.com/mtp/lesson/636909/print</a></li> <li>Researching Climate</li> <li><a href="https://betterlesson.com/lesson/636484/researching-climatedata">https://betterlesson.com/lesson/636484/researching-climatedata</a></li> <li>Make Your own Baromete<a href="http://www.weatherwizkid.com/experiments-baro">http://www.weatherwizkid.com/experiments-baro</a></li> </ul>



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					<p>meter.htm</p> <ul style="list-style-type: none"> <li>• Blue Sky Experiment  <a href="http://www.weatherwizkids.com/experiments/bluesky.htm">http://www.weatherwizkids.com/experiments/bluesky.htm</a></li> <li>• Make Fog in a Jar  <a href="http://stem-works.com/external/activity/418">http://stem-works.com/external/activity/418</a></li> <li>• Make a Rain Gauge  <a href="http://stem-works.com/external/activity/247">http://stem-works.com/external/activity/247</a></li> <li>• Magic School Bus weather  <a href="http://stem-works.com/external/activity/137">http://stem-works.com/external/activity/137</a></li> <li>• Make it Rain Experiment  <a href="http://stem-works.com/external/activity/225">http://stem-works.com/external/activity/225</a></li> </ul>
<b>A P R I L</b>	FOSS Science Module: Design a Machine to Prevent Weather-Related Hazards	Investigation 3- Design and Present a New Machine to Prevent Weather -Related Hazards SWBAT make a claim about the merit of a design that reduces the impacts of a weather related hazard. <ul style="list-style-type: none"> <li>• define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> <li>• generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>• plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</li> </ul>	<ul style="list-style-type: none"> <li>• a. identifies that science ideas have changed over time based on new evidence, but much more remains to be understood because science will never be finished.</li> <li>b. uses timelines as a possible tool to show change in scientific knowledge over time.</li> <li>c. identifies that knowledge changes as new evidence is known, found, and/or understood.</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnostic assessments</li> <li>• Formative assessments</li> <li>• Summative assessments</li> <li>• Ipsative assessments</li> <li>• Norm-referenced assessments</li> <li>• Criterion-referenced assessments</li> </ul>	<p>Questions in the Project Folder Individual and Class Discussions            Teacher Observation            Student Journals            Performance Assessment Tasks Data Sheets Lab Notebooks</p>

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M A Y	<ul style="list-style-type: none"> <li>• 24</li> <li>• Straw</li> <li>• Bridge</li> <li>• Challenge</li> </ul>	Investigation 3- SWBAT build a bridge that would hold a cup of 100 pennies without falling over	<ul style="list-style-type: none"> <li>• a. develops additional questions that support further understanding of the context.</li> <li>• a. states evidence from data to justify/explain conclusions.</li> <li>• a. conducts investigations using the science content being studied. b. plans a simple investigation, decides what simple observations can be made, and explains their results.</li> <li>• a. asks questions that can be measured using scientific vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Rubrics for research,/developm ent,</li> <li>• engineering process development for improvement after first construction</li> <li>• aesthetics and design</li> <li>• function</li> <li>• bonus points for strongest bridge challenge at the end: keep adding until no one's bridge stands!</li> </ul>	Building a Bridge - <a href="https://thestemlaboratory.com/straw-bridges/">https://thestemlaboratory.com/straw-bridges/</a> Flood protection design <ul style="list-style-type: none"> <li>• <a href="https://betterlesson.com/lesson/634338/protect-my-home">https://betterlesson.com/lesson/634338/protect-my-home</a></li> <li>• Building an earthquake resistant structure</li> <li>• <a href="https://betterlesson.com/lesson/636080/building-an-earthquakeresistant-structure">https://betterlesson.com/lesson/636080/building-an-earthquakeresistant-structure</a></li> <li>• <a href="https://betterlesson.com/lesson/635940/designing-anearthquake-resistant-structure">https://betterlesson.com/lesson/635940/designing-anearthquake-resistant-structure</a></li> <li>• <a href="http://teachers.egfi-k12.org/activity-earthquake-proof-structure/">http://teachers.egfi-k12.org/activity-earthquake-proof-structure/</a></li> <li>• Tacoma Narrows Bridge Collapse "Gallop'n' Gertie"               <ul style="list-style-type: none"> <li>○ <a href="https://www.youtube.com/watch?v=j-zczJXSxrw">https://www.youtube.com/watch?v=j-zczJXSxrw</a></li> <li>○ <a href="http://ngss.nsta.org/classroom-resources/results.aspx?CoreIdea=5">http://ngss.nsta.org/classroom-resources/results.aspx?CoreIdea=5</a></li> </ul> </li> </ul>

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