


## Essential Question Inquiry Based Lesson Plan Template

<b>Title</b>	Physical and Chemical Changes
<b>Grade Level/Subject</b>	4 <sup>th</sup> Grade Science
<b>Overview of Lesson</b>	Students will conduct a variety of experiments to discover what properties change during physical and chemical changes that would help to classify them as such. The students will compose a glog (interactive poster) to present their findings as if they are training/educating others.
<b>Web Address for Activity Information</b> (Where can students find guidance for inquiry activity? This would be Blog, Google docs, WIKI , WebQuest, web address)	<a href="http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911">http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911</a>
<b>Essential Question</b> (What is the essential/main question that students will be answering in this activity?)	Investigate what properties classify a physical or chemical change.
<b>Suggested Foundation/Subsidiary Questions</b> (What are some guided questions that should be answered to help with answering essential question)	<p>What properties change during each experiment?</p> <p>What properties would change if instead of freezing a substance, the frozen substance were left outside the freezer?</p> <p>How do the beginning substance and the end substance of a chemical change differ?</p> <p>How do the properties of the beginning substance and the end substance of a chemical change differ?</p>
<b>Content Standards Addressed</b>	<p>Identify characteristics of a simple physical change (e.g., heating or cooling can change water from one state to another and the change is reversible).</p> <p>Identify characteristics of a simple chemical change. When a new material is made by combining two or more materials, it has chemical properties that are different from the original materials (e.g., burning paper, vinegar and baking soda).</p>

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<p><b>Activities/Tasks</b></p> <p><b>Procedures of activities</b></p> <p>Include a full explanation of how technology be utilized.</p>	<p>Day 1</p> <p>Prep: Set up a station for each experiment around the room. Assign a teacher's aid to stay at either the Pancakes or Matchstick station while you stay at the other.</p> <ol style="list-style-type: none"> <li>Students will visit <a href="http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911">http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911</a> and open up their scientific notebooks using <a href="http://www.penzu.com">www.penzu.com</a> in a new tab.</li> <li>Students will read through the introduction and copy the focus question into their scientific notebook.</li> <li>Students will brainstorm three questions that may help lead them to their response to the focus question.</li> <li>Students will circulate around the room in groups of four or five to each station. Once they have completed a station, they will return to their laptop where they will respond to each station's question(s). Each station will take a different amount of time. If a group is waiting on a station to open up, they will explore the resources, use search engines to help answer the questions they brainstormed, or begin working on their glog (poster).</li> <li>After all stations have been completed, serve pancakes and freezer pops and facilitate discussion over the students' three questions they brainstormed at the beginning of the lesson.</li> </ol> <p>Day 2</p> <ol style="list-style-type: none"> <li>Give students lab time to work on their glogs. Circulate around the room to help each student. As the students complete their projects, post them in the conclusion section of the activity webpage.</li> <li>Have each student explain the information posted on their glog as if they were presenting it to new scientists.</li> <li>Watch the BrainPop video and do the quiz together as a class.</li> </ol> <p>Technology Integration:</p> <p>Important questions, instructions, examples, rubric, and resources are found at <a href="http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911">http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911</a> Students will use <a href="http://www.penzu.com">www.penzu.com</a> to keep lab notes. This tool allows them to access their notes at any computer with Internet access and add pictures of their experiments. Digital cameras will be used to take pictures of their experiments. Students will use a variety of websites online to view examples and use search engines to find information. Students will create a glog using <a href="http://www.glogster.com">www.glogster.com</a> to present their information, examples, and helpful websites or videos.</p>
<p><b>Possible Resources</b></p>	<p>Activity Website  <a href="http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911">http://www.tiffin.k12.oh.us/olc/page.aspx?id=12852&amp;s=911</a>            Paper Snowflake Video  <a href="http://teachertube.com/members/viewVideo.php?video_id=6819">http://teachertube.com/members/viewVideo.php?video_id=6819</a></p>

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	<p>Additional Instructions for Paper Snowflakes  <a href="http://highhopes.com/snowflakes.html">http://highhopes.com/snowflakes.html</a>            How to Create a Glog Video  <a href="http://www.teachertube.com/viewVideo.php?video_id=144689">http://www.teachertube.com/viewVideo.php?video_id=144689</a>            Glogster Website  <a href="http://www.glogster.com">www.glogster.com</a>            Chemistry of Fireworks Video  <a href="http://videos.howstuffworks.com/hsw/8207-the-chemistry-of-fireworks-video.htm">http://videos.howstuffworks.com/hsw/8207-the-chemistry-of-fireworks-video.htm</a>            Reaction of Sodium with Chlorine  <a href="http://jchemed.chem.wisc.edu/jcesoft/cca/cca0/Movies/NACL1.html">http://jchemed.chem.wisc.edu/jcesoft/cca/cca0/Movies/NACL1.html</a>            Mentos and Soda Pop  <a href="http://teachertube.com/members/viewVideo.php?video_id=1378&amp;title=Our%20Diet%20Pepsi%20Mentos%20Experiment">http://teachertube.com/members/viewVideo.php?video_id=1378&amp;title=Our Diet Pepsi Mentos Experiment</a>            Physical Change Description  <a href="http://www.schools.utah.gov/curr/science/sciber00/8th/matter/sciber/change.htm">http://www.schools.utah.gov/curr/science/sciber00/8th/matter/sciber/change.htm</a>            Physical and Chemical Changes Quiz  <a href="http://virtual.yosemite.cc.ca.us/lmaki/chem150-99/chapters/chapter1/lessons/phys_chem/phy_c_1.htm">http://virtual.yosemite.cc.ca.us/lmaki/chem150-99/chapters/chapter1/lessons/phys_chem/phy_c_1.htm</a>            BrainPop Video  <a href="http://www.brainpop.com/science/matterandchemistry/propertychanges/">http://www.brainpop.com/science/matterandchemistry/propertychanges/</a></p>
<p><b>The Final Product</b></p> <p><b>What will students produce that represents their answer to the essential question?</b></p>	<p>Students will create a glog that includes an explanation of the properties that change during a physical and chemical change. They will have examples of a physical and chemical change with pictures and include at least two links to webpages or videos that are helpful in learning about physical and chemical changes.</p> <p>Example Template</p> 

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<b>Assessment - Attach Rubric</b>	<b>Name:</b> <span style="float: right;"><b>Physical and Chemical Changes</b></span>				
	Total___/15				
	<b>Criteria</b>	<b>Excellent</b>	<b>Minor Revision s Require d</b>	<b>Major Revision s Require d</b>	<b>Unacceptabl e</b>
	Identified characteristics/properties of a physical change	3	2	1	0
	Explained an example of a physical change and included a picture or video	3	2	1	0
	Identified characteristics/properties of a chemical change	3	2	1	0
	Explained an example of a chemical change and included a picture or video	3	2	1	0
	Included two or more web links to resources that are helpful in understanding physical and chemical changes	3	2	1	0

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<b>Teacher Commentary Reflection</b>	<p>What problems do you anticipate with this lesson?</p> <p>Students who do not have much experience with typing, conducting web searches, and putting together a blog may have difficulty doing so. I could put students with low computer skills with students that have adequate computer skills to help them. During the stations, a lot will be going on at once and students may begin to goof off, especially if they get done with a station before any others are open. I will need to keep an eye on students and perhaps request for an additional aide to help facilitate the activities. Also, I will need to make sure that the students working at computers are going to the designated sites and searching for resources appropriately.</p> <p>How will this lesson fit into your overall curriculum planning?</p> <p>We discuss physical and chemical changes during the second half of the year. The chapter offers direct explanations of each whether than presenting it in a way that students can ask questions and experiments to discover what the real difference is. I would use this lesson to introduce the topic and then follow-up by reading from the book so the students will get a refined definition. This lesson will be an engaging way for students to understand the concept. It will help them to develop inquiry skills to approach unknown concepts in the future.</p>
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