

K-5 Science Lesson Plan

Teacher: Ms. Dyson		Grade: 5 th	Date(s): 11/10/14
Unit Title: Unit 3 – States of Matter		Corresponding Unit Task: 5.P.3.2, Performance Task 1 (<i>to create a flip book that shows 3 different types of materials and how adding or taking away heat can change the state of the matter.</i>)	
Essential Question(s): How can changes within states of matter occur?			
Materials/Resources		Essential Vocabulary	
Teacher: http://www.middle-school-chemistry.com/lessonplans/chapter2/lesson5	Student: <ul style="list-style-type: none"> • 2 cubes per student • 2 small clear plastic cups per student • water • 1 activity sheet per student 	heating, cooling, boiling, conductor, insulator, solid, liquid, gas, weight, mass	
Learning Experience			
<p>Inquiry Based Learning:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use of the 5 E Lesson format <input type="checkbox"/> Learner-centered instruction <input type="checkbox"/> Use of scientific investigation, problem solving or engineering design <input type="checkbox"/> Hands on-minds on instructional strategies <input type="checkbox"/> Use of Process skills in context-predict, observe, measure, classify, infer, communicate <input type="checkbox"/> Peer Discussion – scientific arguments and explanations <input type="checkbox"/> Use appropriate tools accurately 	Essential Standards: 5. P.3.2- EXPLAIN how heating and cooling affect some materials and how this relates to their purpose and practical applications.		
	I Can Statement(s): I can explain changes in states of matter.		
	<p>Engage: Activating Strategy/Hook:</p> <ul style="list-style-type: none"> • Show students video “Ice Melting on Different Surfaces” (http://www.middle-school-chemistry.com/multimedia/chapter2/lesson5#ice_melting_on_different_surfaces). This video shows two cubes of ice on a hot plate. One cube is melting while the other is not. Following the clip, have students respond to the following writing prompt (also saved on PP): “What can you infer about this experiment? How does this relate to states of matter?” • Discuss student observations. <i>Where do you think the energy came from to melt the ice? What do you think happened to the speed of the molecules when the ice was heated?</i> • Distribute activity sheets (http://www.middle-school-chemistry.com/lessonplans/chapter2/lesson5) • Give students time to answer first 2 questions of this activity sheet 		
	<p>Explore: Learning Experiences</p> <ul style="list-style-type: none"> • Distribute 2 cubes of ice and 2 small clear plastic cups (one half filled with water). • Go over directions for the experiment from activity sheet. Introduce control (similar sized ice cubes) for the experiment. • Have students 		
<p>Explain: Learning Experiences</p> <p>Expected results</p> <ul style="list-style-type: none"> • The ice placed in the water will melt faster than the ice in air. Since the water and the air are both at room temperature, it may not be obvious why the ice melts faster in the water. There are so many more molecules in the water that can contact the ice that the 			

- Focus on detail
 - precision & accuracy in observations and measurements
- Use of collaboration for learning

transfer of heat to the ice is much more efficient and faster in the water than in the air.

Elaborate: Extending & Defining

- Show animation of ice melting (http://www.middleschoolchemistry.com/multimedia/chapter2/lesson5#melting_ice). Point out that the water molecules in ice vibrate but don't move past each other. As the temperature increases they begin to vibrate more. Eventually their movement overcomes their attractions and they can no longer stay in their orderly crystal structure. As the ice melts, the orderly arrangement collapses and the water molecules move past each other and actually get closer together as liquid water.
- Show image of ice and water (http://www.middleschoolchemistry.com/multimedia/chapter2/lesson5#ice_and_water). Ask students, "how did the motion and arrangement of the water molecules change as the ice melted?"
- Show Image States of Matter (http://www.middleschoolchemistry.com/multimedia/chapter2/lesson5#states_of_matter). Explain that this illustration shows how molecules look when states of matter change.
- Show images States of Water. Tell students that the motion of water molecules in each state of matter is similar to what happens for most substances. Adding energy increases the motion of the molecules and causes them to move further apart. Removing energy decreases the motion of the molecules and causes them to move closer together. But, water does something very unusual when it freezes to become ice. The molecules, which were moving closer and closer together, move further apart as they organize themselves into the open ring pattern shown below for ice. This is why ice expands when it freezes.
- Ask students, "How are the state changes of water similar to and different from the state changes in most other substances?"

Evaluate: Summarizing Strategy

- Students will complete remainder of activity packet

Differentiation Strategies

Extension	Intervention	Language Development
Dry ice experiment		

Assessment(s):
Activity packet responses

Teacher Reflection: (Next steps?)