

Lesson Plan Template

Grade: 6		Subject: Physical Science	
Materials: Worksheets, Chromebooks		Technology Needed: PHeT Simulation	
Instructional Strategies: <input type="checkbox"/> Direct instruction <input type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list)		Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain:	
Standard(s)- Performance Standard MS-PS1-4 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.		Differentiation Below Proficiency: Students will be able to identify the three phases of matter and how they change in particle motion when energy is added or taken away through an interactive simulation. Students will record their understanding on a paper worksheet. Students below proficiency will likely need reference to their notes, additional help from the teacher, and additional help from the teacher aid. Above Proficiency: Students will demonstrate the three phases of matter and how they change in particle motion when energy is added or taken away through an interactive simulation. Students will record their understanding on a paper worksheet. Students above proficiency will be able to challenge themselves and work with the pressure simulation to understand how pressure effects volume and energy. Approaching/Emerging Proficiency: Students will apply their knowledge of the three phases of matter and how they change in particle motion when energy is added or taken away through an interactive simulation. Students will record their understanding on a paper worksheet. Students approaching proficiency will likely need the reference to their notes and minimal assistance from the teacher.	
Objective(s) Students will demonstrate an understanding of the three phases of matter and how each phase changes in particle motion when energy is added or taken away through an interactive simulation. Students will record their understanding on a paper worksheet. Bloom's Taxonomy Cognitive Level: Apply		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students are expected to be on task and respectful. They should be listening and engaged when I am giving direct instruction. They should be working and asking questions when they need help during work time.	
Classroom Management- (grouping(s), movement/transitions, etc.) Students will be working independently at their desks to minimize any behavior issues.		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students are expected to be on task and respectful. They should be listening and engaged when I am giving direct instruction. They should be working and asking questions when they need help during work time.	
Minutes	Procedures		
0	Set-up/Prep:		
2	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) Review, what are the three states of matter? (A. Solid, liquid, gas) Which state of matter has the most energy? (A. gas) Which state of matter has the least energy? (A. solid)		

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7	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <p>I will explain today's activity: Phase of Matter Simulation. I will pull up Google Classroom and show the students where they will find the link for today. Some important notes: They will click on STATES. I will go over how to use the simulation. They will want to turn temperature to Celsius. They can manually add/remove heat energy or they can click on the states of matter. When they are done they can also explore the pressure section as a challenge. I will pass out the paper portion of this practice and students will begin to explore.</p>	
25	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <p>Using the link below, students will explore the phases of matter simulation. (First they must make some predictions!) If students finish early they can work on:</p> <ol style="list-style-type: none"> 1. The Chemical/Physical changes practices (Due Friday) 2. The Phase Change Practice (Going over Thursday) 3. Explore the pressure section of the simulation 4. Any late work <p>https://phet.colorado.edu/en/simulation/states-of-matter-basics https://phet.colorado.edu/en/simulation/states-of-matter-basics</p>	
2	<p>Review (wrap up and transition to next activity):</p> <p>The last two minutes students can pack up and put away materials to get ready for their next class.</p>	
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check- in strategies, etc.</p> <p>I will be monitoring student work using proximity to ask questions, redirect attention, and answer questions.</p>	<p>Summative Assessment (linked back to objectives)</p> <p>The completion of the simulation. Additionally there will be a summative assessment at the end of the week that will cover phases of matter.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>	
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</p> <p>This lesson went well, the students were engaged during the direct instruction and were eager to answer the review questions I posed. The work time was also very productive, a few students completed the assignment during work time. I saw some students moving on to the pressure section of the simulation. If I were to change something from this lesson, I would have added an short activity or review to end the lesson after the students packed up their school supplies.</p>		

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PHET Simulation Paper Portion:

Name: _____
Class: _____

Date: _____
States of Matter Simulation Lab

States of Matter Simulation Lab

Before you open the simulation:

PREDICT

1. Draw a diagram below showing what you think the molecules will look like for each state of matter, solid, liquid, and gas. Write a sentence below each diagram predicting what the motion of the molecules will be like.

	Solid	Liquid	Gas
Diagram of molecules			
Sentence explaining how molecules will be moving.			

2. If you start with a substance as a solid, what will happen to the molecules as you add thermal energy (heat)? _____

ONCE YOU HAVE COMPLETED THIS PAGE, YOU MAY BEGIN THE SIMULATION.

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Open the simulation. You will find it in a folder on your desktop labeled "States of Matter Simulation."

INVESTIGATE:

3. Use the menu on the right side of the program to select Water and Solid. Draw and describe what you see in the space below.

Diagram	Description

4. Notice the thermometer at the top of the program. What temperature scale is this thermometer showing? _____

5. What happens to the water as you increase the temperature? _____

6. What is the melting/freezing point of water in Celsius? _____

7. Add heat until the temperature is just below and then just above the melting point of water. How is water different below its melting point and above it? _____

8. Draw and describe what water looks like as a liquid.

Diagram	Description

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9. What is the boiling/condensation point of water in Celsius? _____

10. Continue to add heat until you are just below and then just above the boiling point of water. How is water different below its boiling point and above it? _____

11. Draw and describe what water looks like as a gas.

Diagram	Description

12. Choose one of the other three substances listed in the menu on the right. Investigate what happens when you add and remove heat from this substance. Use the buttons on the right to see this substance as a solid, liquid, and gas. Draw and describe its properties in the table below.

Substance Selected: _____

	Solid	Liquid	Gas
Diagram of molecules	 		
Sentence explaining how molecules are moving.			

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ANALYZE:

13. How was this substance similar to water in each state of matter? How was it different? _____

14. Were your predictions (see p. 1) correct or incorrect? Explain. _____

15. Choose a substance other than water from the menu on the right side of the program. Use the slider to add and remove heat. Based on what the molecules do, figure out the approximate temperatures of the melting point and boiling point of this substance. (Hint: The temperatures given when you click solid, liquid, and gas are NOT the melting and boiling points.)

Substance: _____

Melting Point: _____

How did you figure it out? _____

Boiling Point: _____

How did you figure it out? _____
