

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PHET Simulation: States of Matter

 <http://phet.colorado.edu/en/simulation/states-of-matter>

Experiment with the simulator to answer these questions.

Part 1: Solid, Liquid, Gas

1. Describe AND Draw the molecules in a Solid, Liquid, and Gas.

Gas -

Liquid-

Solid -

2. Which requires more energy (heat) to go from a solid to a liquid?

neon / argon /oxygen / water

Part 2: Phase Changes

1. Adjust the heat and pressure (push down on the lid) to make neon a liquid.

Notice the red dot on the graph

What is the temperature? K

What is the pressure? \_ ATM (atmospheres)

2. Try this:

 Cool water to 3OK (then reset the heat control to zero)

 Increase the pressure slowly . Can you get the ice to melt (turn to a liquid)

without adjusting the heat control? Temp \_oK pressure ATM

 Increase the temperature further but don’t let it explode (start over if it does). Can you get the water (liquid) to turn to a gas without adjusting the heat control? Temp \_ \_oK pressure ATM

3. What happens to a solid when you slowly increase the pressure?

 What happens if you increase the pressure too far?

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4. How can argon exist as a solid when the pressure is above 95 ATM? (What did you have to change)?

5. As the pressure of a liquid increases, its boiling point (temp at which it turns to a gas)

increases / decreases / stays the same

6. As the pressure of a liquid decreases, its boiling point increases / decreases / stays the same

7. Why does a hot dog take longer to cook in boiling water when it is high in the mountains then when it is at sea level?

8. Why does food in a pressure cooker (high pressure) cook faster than at normal pressure?

Research question – use what you learned from this activity and your research skills (Google)

9. How would our simulator explain the production of dry ice from carbon dioxide gas?