

Name: _____

States of Matter **SIMULATION** Lab

Directions – Go to the following website to make observations about the effect adding and taking away thermal energy has on different elements and molecules.

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

Click on “States”



Predict

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

Investigate

2. Use the menu on the right side of the program to select **Neon** and **Solid**. Do the same for argon, oxygen and water as a solid. Draw and describe what you see in the space below.

DRAW	DESCRIBE
Neon	
Argon	
Oxygen	
Water	

3. Why do you think one of the particles did not follow the same pattern as the other three as a solid?

4. Use the menu to observe all 4 particles in the **liquid** state and then as a **gas**. Draw and describe what you see in the space below.

DRAW - LIQUID	DESCRIBE	DRAW - GAS	DESCRIBE
Neon		Neon	
Argon		Argon	
Oxygen		Oxygen	
Water		Water	

Explanation - Density is defined as the ratio of mass per unit volume of a substance. The mass means how much matter is in the substance and the volume is the space the matter takes up. The more tightly packed the particles are in a certain space, the higher the density.

5. Go back and look at each of the particles (neon, argon, oxygen, and water) which one is the most dense as a solid (closest particles)?
6. Go back and look at each of the particles (neon, argon, oxygen, and water) which one is the least dense as a solid (most space between particles)?
7. Explain how the density of each of the particles change as heat is added to the simulation.
8. Explain how the density of each of the particles change as "cool" is added to the simulation.