

States of Matter Online Lab

Name _____

Have you ever wondered why water changes how it looks when it warms up or cools down? This simulation will show you!

Setup

- 1) Navigate to [States of Matter: Basics](#)
- 2) Click the “States” button and select “Water” from the list in the upper-right corner.
- 3) **Change the temperature** pull-down menu above the thermometer from **146K** to **-127°C** (*K stands for Kelvin – a unit of temperature that does not use negative values*).

Exploration

- 4) **Try out this tab’s different features**, including the Heat / Cool option on the bottom and changing between states of matter on the right side.

Record two observations you notice about the simulation.

- 1) _____
- 2) _____

Guided Learning

- 5) Click the **reset button** at the bottom-right of the screen. Choose **Water** from the top-right corner and **change the units back to Celsius**. **Slowly heat the water molecules to 50°C. What happens to the molecules as they warm up?**

- 6) Continue to heat the molecules to 150°C. **What happens to the molecules as they warm up even more?**

- 7) **What state of matter (solid, liquid, or gas) is the water at the following temperatures?**

-100°C: _____ 50°C: _____ 150°C: _____

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8) Switch to Neon. Slowly start to heat the block of Neon.

What do you notice happens to the Neon atoms as they heat up?

9) **Describe how you can tell when Neon (or any substance) changes from a solid to a liquid or from a liquid to a gas.**

10) Determine the approximate temperature at which Neon changes the state of matter using only the simulation.

Your guess using the simulation:

Solid to Liquid Temperature:

Liquid to Gas Temperature:

11) Research the actual temperature at which Neon changes phase.

Actual temperature for phase changes of Neon:

Solid to Liquid Temperature:

Liquid to Gas Temperature:

12) Repeat this process for the other two materials (Oxygen and Argon).

Argon	Your Guess	Actual	Oxygen	Your Guess	Actual
Solid to Liquid Temp. (°C)			Solid to Liquid Temp. (°C)		
Liquid to Gas Temp. (°C)			Liquid to Gas Temp. (°C)		

13) **Describe three things you learned in this simulation.**

1.

2.

3.