

# 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?**

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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.

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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. \_\_\_\_\_