

Name(s): _____ Hour: _____ Date: _____

States of Matter

Set Up:

1. Open the [PhET simulation](https://phet.colorado.edu/en/simulation/states-of-matter-basics) for States of Matter: Basic (<https://phet.colorado.edu/en/simulation/states-of-matter-basics>).
2. Select the States button.
3. Under the "Atoms & Molecules" box in the upper right-hand corner, select "water".

Part 1: Investigate state changes (Adding Thermal Energy):

1. Start with water in the **solid** phase.
2. Use the slider to heat the water until the thermometer reads between 330 K and 365 K.
You are adding thermal energy to the system. Describe how the **motion** and **relative spacing** of the particles changes when they gain thermal energy?

3. What **state of matter** is the water in now?

4. What **process** did you just model?

5. Continue adding thermal energy to the system by heating the water until the thermometer reads between 800 K and 825 K. Describe how the **motion** and **relative spacing** of the particles changes when they gain even more thermal energy?

6. What **state of matter** is the water in now?

7. What **process** did you just model?

Part 2: Investigate state changes (Losing Thermal Energy):

1. Reset the water to the **gas** phase.
2. Use the slider to cool until the thermometer reads between 330 K and 365 K. You are removing thermal energy from the system. Describe how the **motion** and **relative spacing** of the particles changes when they lose thermal energy?

3. What **state of matter** is the water in now?

4. What **process** did you just model?

5. Continue removing thermal energy by cooling the system until the thermometer reads between 5 K and 20 K. Describe how the **motion** and **relative spacing** of the particles changes when they lose thermal energy?.

6. What **state of matter** is the water in now?

7. What **process** did you just model?
