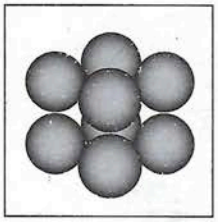
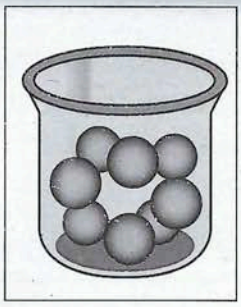
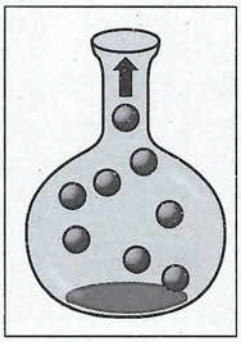
Most matter has three states: solid, liquid, and gas. Matter is made of particles that move around at different speeds (even if the movement is not visible to the human eye). The state depends on how quickly the particles in the matter are moving. When particles move, the movement creates energy, which can be measured by temperature since motion gives off heat. Matter changes its state when its energy changes.



A **solid** is an element or compound with a definite shape and volume. Solids do not change shape. Examples of solids include a wooden block, a rubber band, a glass jar, and an ice cube. An ice cube does not change shape based on the glass in which it is dropped, but ice can change to liquid. A solid has the most particles and the least particle movement. The particles are only vibrating in place, which usually cannot be seen by the human eye.



A **liquid** is an element or compound with definite volume, but its shape can change. For example, the shape of water depends on the container that holds it. Water and all liquids change shape depending on the container. A liquid has fewer particles and more space between particles, and the particles vibrate as they move past one another.



A **gas** has no definite volume or shape. Gases fit any container. Ice (solid) and water (liquid) might overflow a container, but water vapor (gas) will fill it. Gas has the fewest particles, which move faster than the particles in the other two states.

## Exercise

1. How are the three states of matter alike and different?_____

2. What are the three states of matter?_____

3. Which state has the most particle movement? The least?_____

4. How is particle movement related to heat?_____

5. Challenge: Why is ice cooler than water?_____