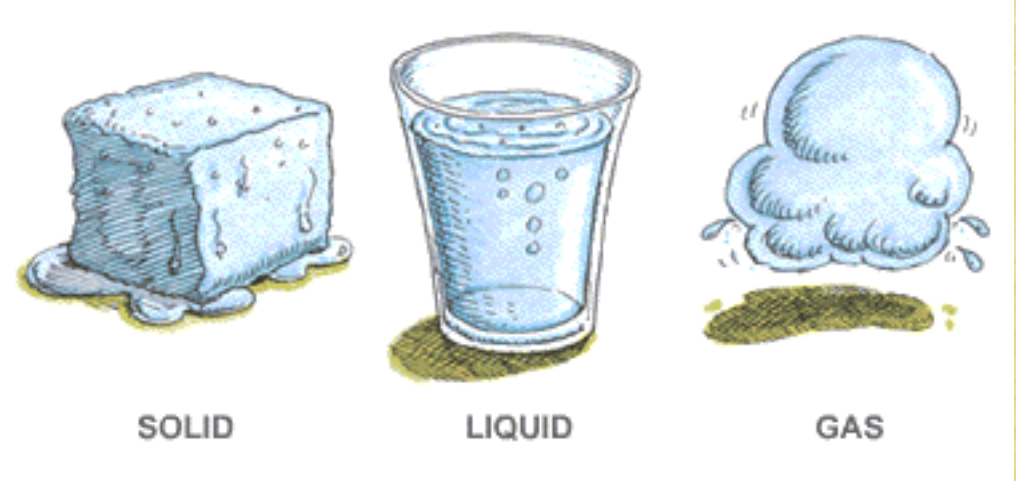
What Are the States of Matter?

Chapter 10 Lesson 2
Part 2

ByDesign Science, Level 4
By Allyssa Sharpe

Changes of State

- Many types of matter can change from one state to another.
- Matter looks different when it changes state, but it is still the same kind of matter.



Changes of State

- Think of ice melting.
- Ice is water in its solid state.
- When ice is changing to water, it melts.

- Melting happens when matter is heated and changes from a solid to a liquid.

Changes of State

- The temperature at which a substance melts is called its melting point.
- The melting point of ice is 0°C (32°F).

Changes of State

Solid	Melting Point
Aspirin	136°C (277°F)
Beeswax	64°C (147°F)
Gold	1064°C (1947°F)
Ice (solid water)	0°C (32°F)
Mercury	-39°C (-38°F)
Salt	801°C (1474°F)
Sugar	186°C (367°F)

Changes of State

- Think about a pot of water on the stove. When the water becomes hot enough, it boils.
- Boiling happens when matter is heated and changes from a liquid to a gas.

- The **boiling point** is the temperature at which a liquid boils and changes to a gas.
- The boiling point of water is 100°C (212°F) at sea level.

Changes of State

- You have probably seen a puddle that disappeared over time.

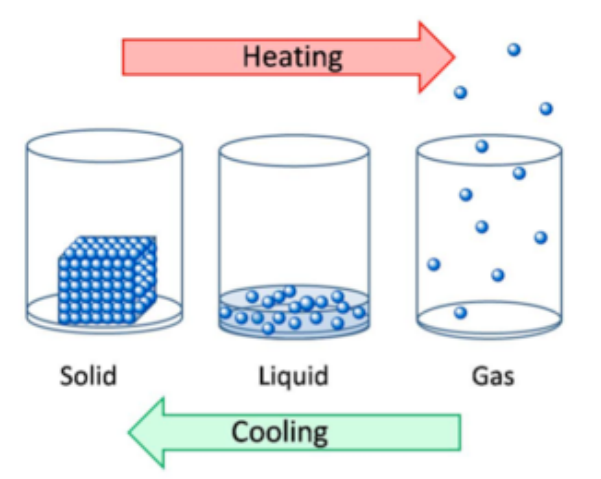
- Some water in the puddle changed to a gas without boiling.
- Matter **evaporates** when it changes from a liquid to a gas.
- Water in the form of a gas is called *water vapor*.

Changes of State

- Cooling air causes water vapor to change to a liquid.
- Matter **condenses** when it changes from a gas to a liquid.

- You may have seen condensation on a bathroom mirror or windowpane after taking a hot shower.
- This is also what causes dew on surfaces outside and fog.

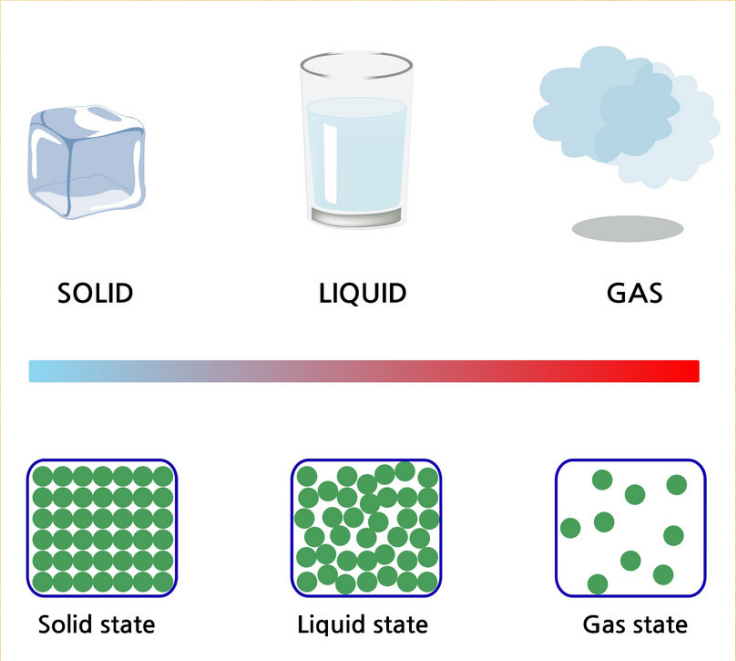
Heating Matter



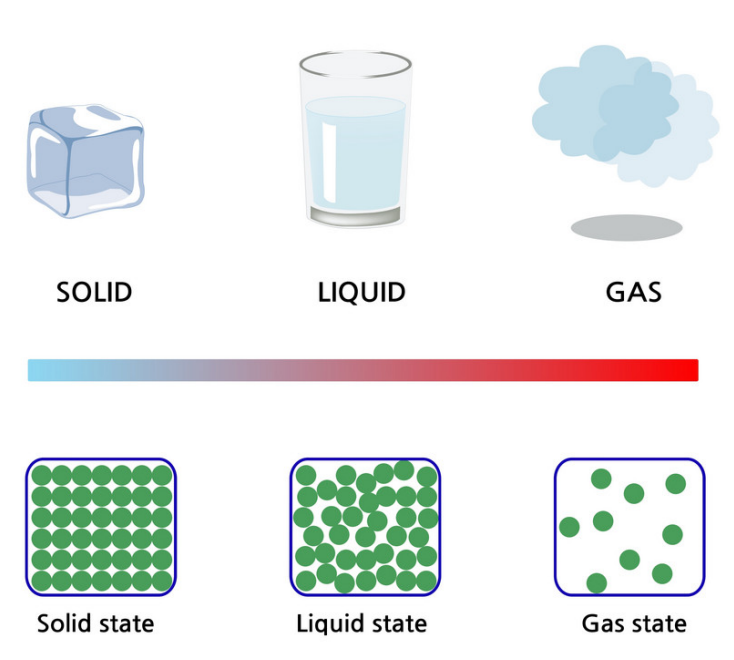
- Recall that thermal energy is the kinetic energy that moves the atoms that make up matter.
- Heat refers to the movement of this energy from one object to another.
- When thermal energy is added to a solid, the atoms begin to move faster.

Heating Matter

- Some atoms begin to break off the solid.
- They can now move around one another.
- They become liquid.



Heating Matter



- If you continue adding thermal energy to a liquid, the atoms of the liquid move faster and move farther apart.
- The temperatures rises.
- The atoms begin to break away from the liquid's surface.

Heating Matter

- Finally, the atoms move so fast that atoms form bubbles of gas within the liquid.
- They rise and escape into the air.
- The liquid becomes a gas.