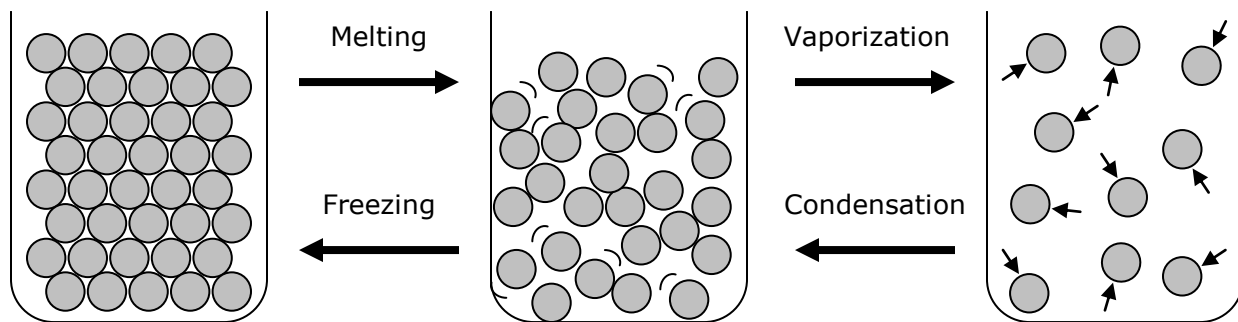


WHAT ARE THE STATES OF MATTER AND HOW ARE THEY DIFFERENT?

Some particles of matter (atoms and molecules) are attracted to one another while others are not. The stronger the attraction, the closer together the particles become. These particles are constantly in motion. Some move freely around while others only vibrate almost standing still. These particles can behave differently when special forces act on them. Temperature is a special force that affects how these particles behave. Higher temperatures cause the particles to move faster while cooler temperatures cause particles to move slower. The differences in how fast the particles move and how strong the attraction between the particles is determine what state of matter a substance will be in.

Below you will see a substance in the different **phases** or **states of matter**. The important thing to note here is that they all represent the same substance. Even though the substance is in a different phase, it is still the same substance.



SOLID
Solids keep their shape and volume.

The particles in a solid vibrate in place. The vibration is not strong enough to overcome the attraction between the particles, so as a result, the particles stay together.

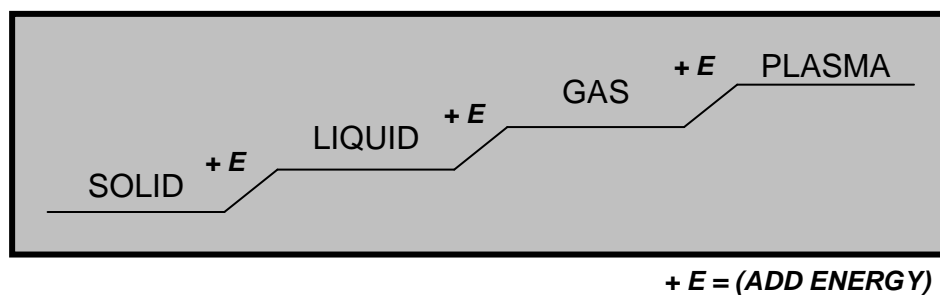
LIQUID
Liquids take the shape of their container while maintaining the same volume.

The particles in a liquid are moving fast enough (faster than in a solid) to overcome the attraction between the particles allowing them to flow easily past one another.

GAS
Gases take the shape of their container like liquids. However, unlike liquids, gases can change their volume to that of the container.

The particles in a gas are moving even faster than in a liquid which allows them to easily separate from one another and fill the entire space that they occupy.

Adding energy in the form of temperature causes a phase change. Phase changes are physical changes. In addition to the three states of matter above, there is another state of matter called plasma. Matter in the plasma state exists only at extremely high temperatures. Plasma is the most abundant state of matter in the universe. Stars, including our sun are made of matter in the plasma state.



+ E = (ADD ENERGY)