

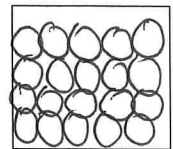
States of Matter

- Matter is composed of very tiny atoms/particles that are constantly in motion.
 - Kinetic theory of matter - how much the particles/atoms move and how much they bump into each other determine the state of matter.
 - Kinetic energy: energy of motion
(* Particles/atoms that make up matter are moving.)
 - As the particles/atoms move about, they collide with each other and everything around.

• States of Matter:

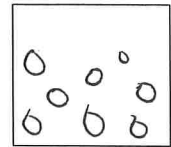
1. Solid: has a definite shape and a definite volume

- The particles vibrate back and forth but are fixed in place.
- Least kinetic energy
- Examples--



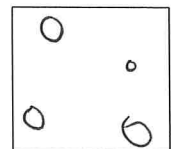
2. Liquid: has a definite volume but no definite shape

- The particles are not packed together as tightly so they slide past one another, which allows it to flow and take the shape of the container.
- More kinetic energy than solids
- Examples--



3. Gas: does NOT have a definite shape or volume

- The particles move so fast that chemical forces can't hold them together.
- Most kinetic energy
- Examples--



4. Plasma: gas that has been heated to such an extreme that the electrons are unstable, or able to jump.

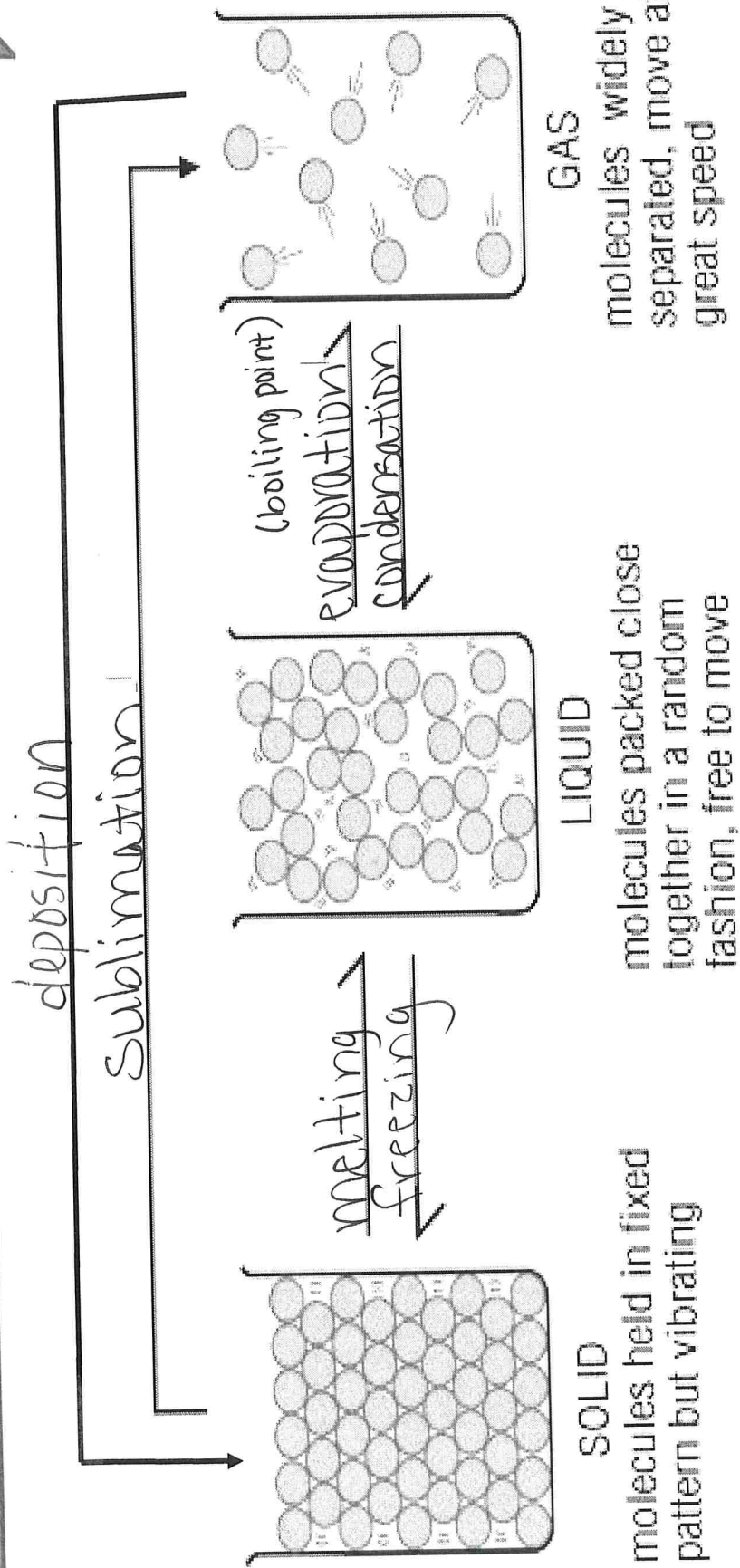
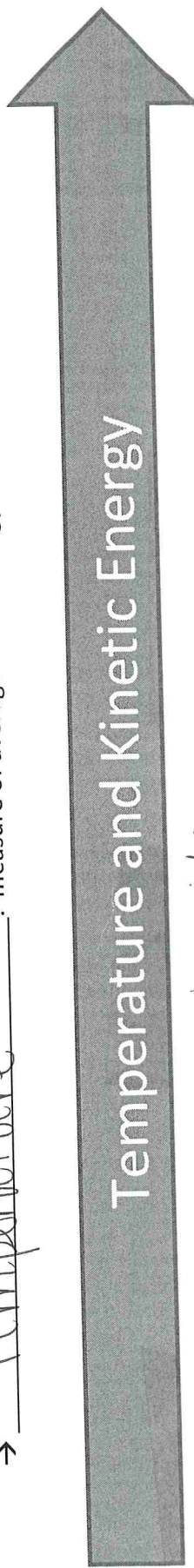
- Makes up the stars, interstellar clouds, comets, and the Northern Lights.

5. Bose-Einstein Condensate: atoms get clumped together at absolute zero (Zero Kelvin) and have almost no energy or movement (can only happen in a lab)

- CHANGE IN STATE DOES NOT CHANGE A SUBSTANCE! It is a physical change only.
- Most forms of matter can exist in the first three states.

- Adding heat (thermal energy) increases the motion of the particles (kinetic energy), which makes them move farther apart, therefore changing state.

→ temperature : measure of average kinetic energy of the particles in a material.



***Many substances can be identified by their boiling and melting points because they melt and boil at specific temperatures.**