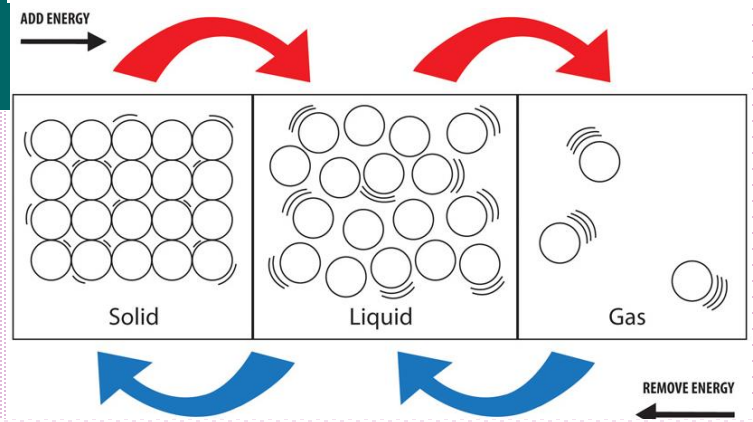
Particles

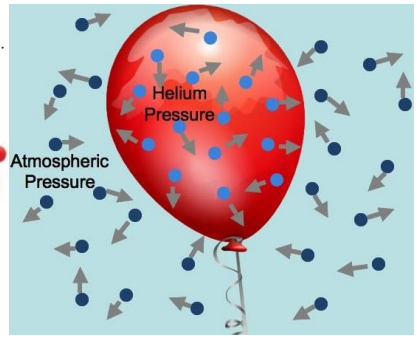
Knowledge organiser created for Eggar's students by Mrs Stanley. Images taken from various online sources.

SOLID: Particles **are closely spaced and vibrating**
Have a fixed shape and cannot flow, because their particles cannot move from place to place.
They cannot be compressed (squashed), because their particles are close together and have no space to move into



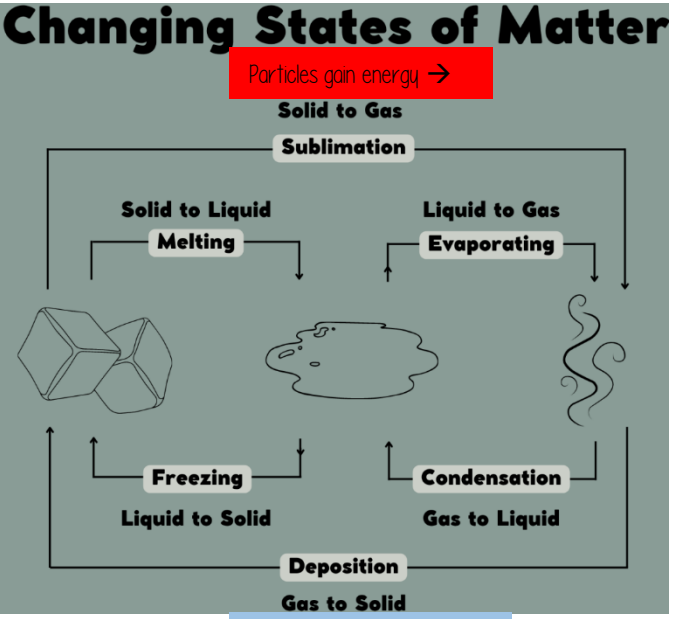
GAS: Particles are in random motion and widely spaced. They can flow and completely fill their container, because their particles can move quickly in all directions. They can be compressed because their particles are far apart and have space to move into.

Pressure: is caused by gas or liquid particles colliding with the walls of a container.
Think of a balloon. Pressure increases when particles move faster.
To do that you can either add more particles into the same container, reduced the volume of the container, or increase the temperature.



LIQUID: Particles are in random motion but in contact. They can flow and take the shape of their container, because their particles can move around each other. They cannot be compressed because their particles are close together and have no space to move into.

Fact: A substance is a solid below its melting point, a liquid above it, and a gas above its boiling point.

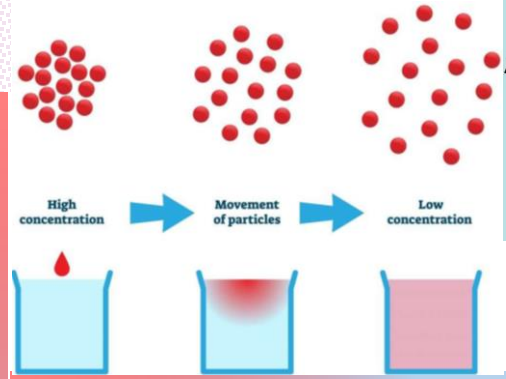


Heating up

- **Melting** - When a solid is heated, it absorbs energy and it melts, turning into a liquid.
- **Boiling** - If the liquid is heated, it absorbs more energy and it boils, turning into a gas.
- These changes absorb energy from the surroundings so they are exothermic.
- **Evaporating** is when a liquid turns into a gas slowly, at temperatures that are below its . Puddles dry up because they – they don't boil.

Cooling down

- **Condensing** - If a gas is cooled, it transfers energy to the surroundings, and turns into a liquid.
- **Freezing** - If the liquid is cooled, it transfers energy to the surroundings, and turns into a solid.
- These changes transfer energy to the surroundings so they are endothermic.



Diffusion: is the process by which particles of one substance spread out through the particles of another substance. Diffusion is how smells spread out through the air and how concentrated liquids spread out when placed in water.
Diffusion happens on its own when the particles spread out from an area of high , where there are many of them, to areas of low concentration where there are fewer of them.

Keywords:

Particle: A very tiny object such as an atom or molecule, too small to be seen with a microscope.

State: The arrangement of the particles - solid, liquid or gas.

Particle model: A way to think about how substances behave in terms of small, moving particles.

Diffusion: The process by which particles in liquids or gases spread out through random movement from a region where there are many particles to one where there are fewer.

Gas pressure: Caused by collisions of particles with the walls of a container.

Density: How much matter there is in a particular volume, or how close the particles are.

Compressed: Particles being pushed closer together.

Evaporate: Change from liquid to gas at the surface of a liquid, at any temperature.

Boil: Change from liquid to a gas of all the liquid when the temperature reaches boiling point.

Condense: Change of state from gas to liquid when the temperature drops to the boiling point.

Melt: Change from solid to liquid when the temperature rises to the melting point.

Freeze: Change from liquid to a solid (solidify) when the temperature drops to the melting point.

Sublime: Change from a solid directly into a gas.