

# Changes in States of Matter

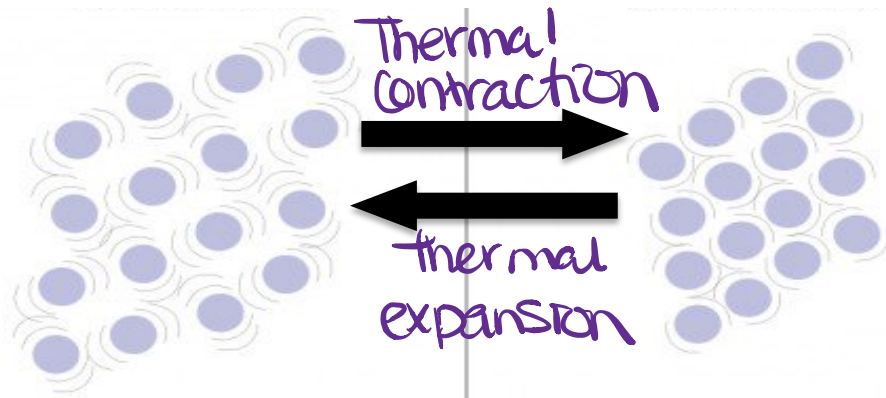
What have we learned so far? Turn to the person next to you and share 3 things!

1. KMT, particle model
2. Solid, liquid, gas
3. matter, volume, mass



Kinetic Energy (KE) is the energy of motion.

Adding Energy	Removing Energy
<ul style="list-style-type: none"> <li>• Particles move <u>faster</u>.</li> </ul>	<ul style="list-style-type: none"> <li>• Particles move <u>slower</u>.</li> </ul>
<ul style="list-style-type: none"> <li>• The space between the particles <u>increases</u>.</li> </ul>	<ul style="list-style-type: none"> <li>• The space between the particles <u>decreases</u>.</li> </ul>
<ul style="list-style-type: none"> <li>• Particles cover <u>more</u> area.</li> </ul>	<ul style="list-style-type: none"> <li>• Particles cover <u>less</u> area.</li> </ul>
<ul style="list-style-type: none"> <li>• The material <u>increases</u> in volume.</li> </ul>	<ul style="list-style-type: none"> <li>• The material <u>decreases</u> in volume.</li> </ul>
<ul style="list-style-type: none"> <li>• Called: <u>Thermal expansion</u></li> </ul>	<ul style="list-style-type: none"> <li>• Called: <u>Thermal contraction</u></li> </ul>



Can you use the concepts of thermal expansion and contraction to explain how a thermometer works?



hot - more energy from heat causes particles to move faster. Particles spread apart and increase area/volume. (Thermal expansion)

cold - less energy (energy removed) causes particles to move slower. Particles move closer to each other and decrease area/volume (Thermal contraction)

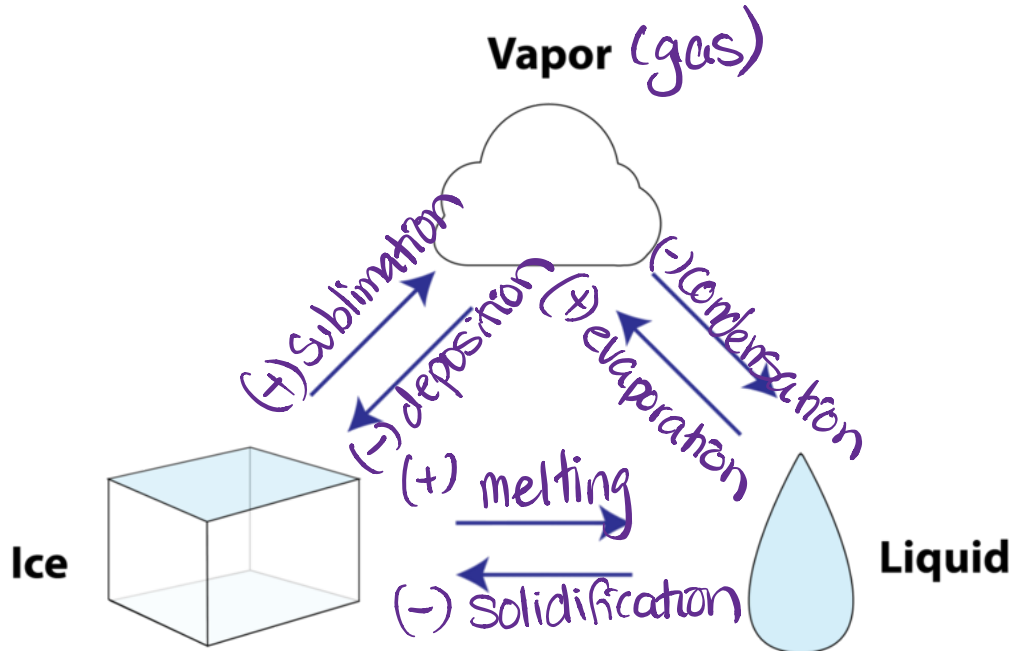
**Sometimes enough energy is added or removed to completely CHANGE the state!**

For each arrow, indicate:

- The name of change of state using the word bank
- Whether heat is gained (+) or lost (-)

Word Bank:

- Condensation
- Deposition
- Evaporation
- Melting
- Solidification
- Sublimation



**Provide an example for each of the changes of state:**

Condensation: water on cool glass of pop	Solidification: water to ice	Sublimation: dry ice
Evaporation: water to steam	Melting: ice to water	Deposition: frost on windshield

**Some more definitions...**

Melting Point: the temperature at which solid turns to liquid

- The melting point of water is: 0°C

Boiling Point: the temperature at which liquid turns to gas

- The boiling point of water is: 100°C

□ **Worksheet**