

Particle Theory and the Classification of Matter

The PSAM Method

What is chemistry?

- * Science: A way of knowing or thinking about nature. It depends on observation, explanations, logical arguments and skeptical review.
- * Chemistry: a branch of science which studies the structure and properties of matter.

What is matter?

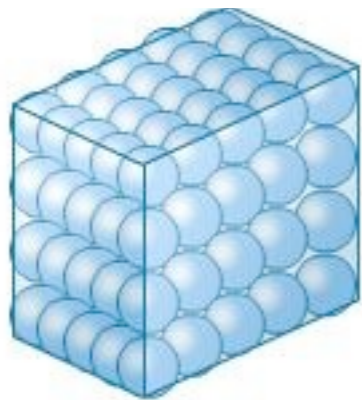
- * Matter: anything that take up space and has mass. The particle theory is a scientific model that explains matter.

Particle Theory of Matter

- * All matter is made of very tiny objects called **p**articles.
- * There are **s**paces between the particles.
- * The particles in a substance **a**tract one each other.
- * The particles are **m**oving.

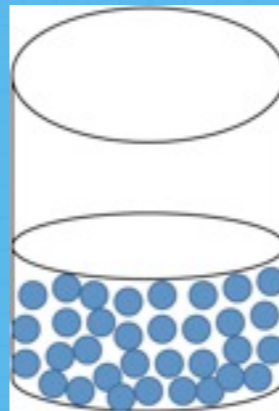
SOLID

- Particles are tightly packed, strong attractive forces hold them together.
- Low energy
- Definite Shape.
- Cannot be compressed.



LIQUID

- Particles are further apart, have strong enough energy to overcome attractive forces.
- Higher energy
- Indefinite Shape. Take on the shape of container.
- Cannot be compressed.

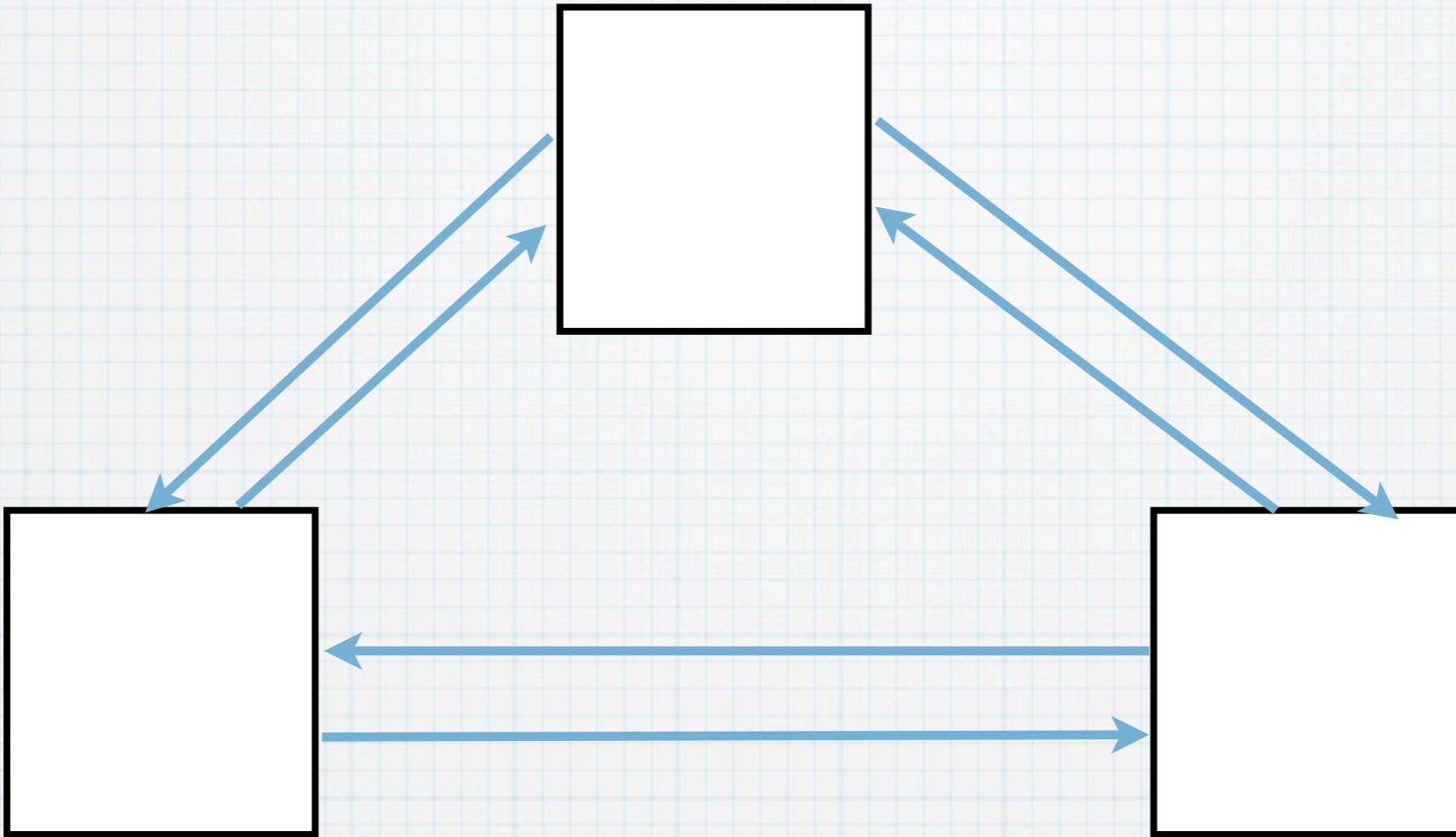


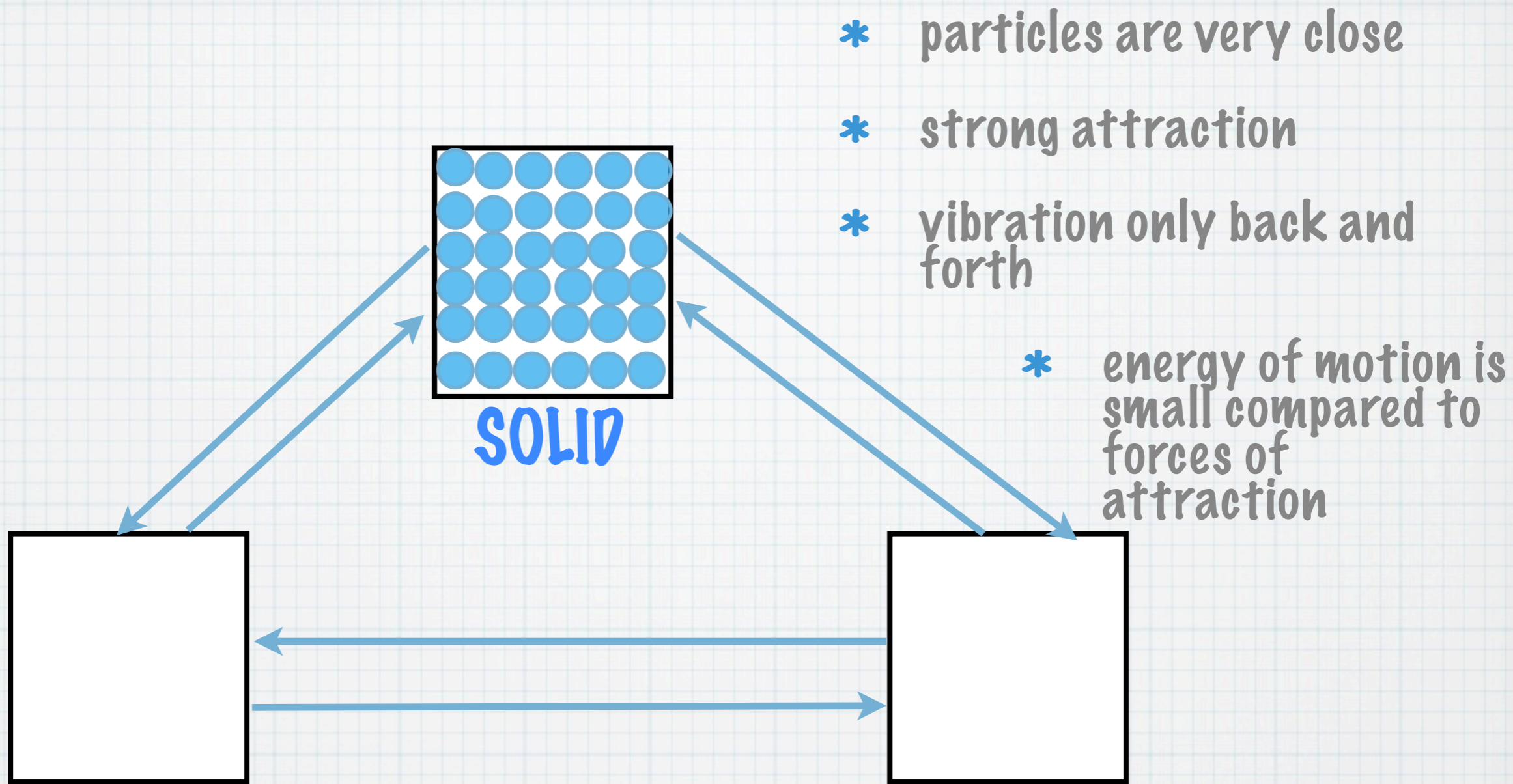
GAS

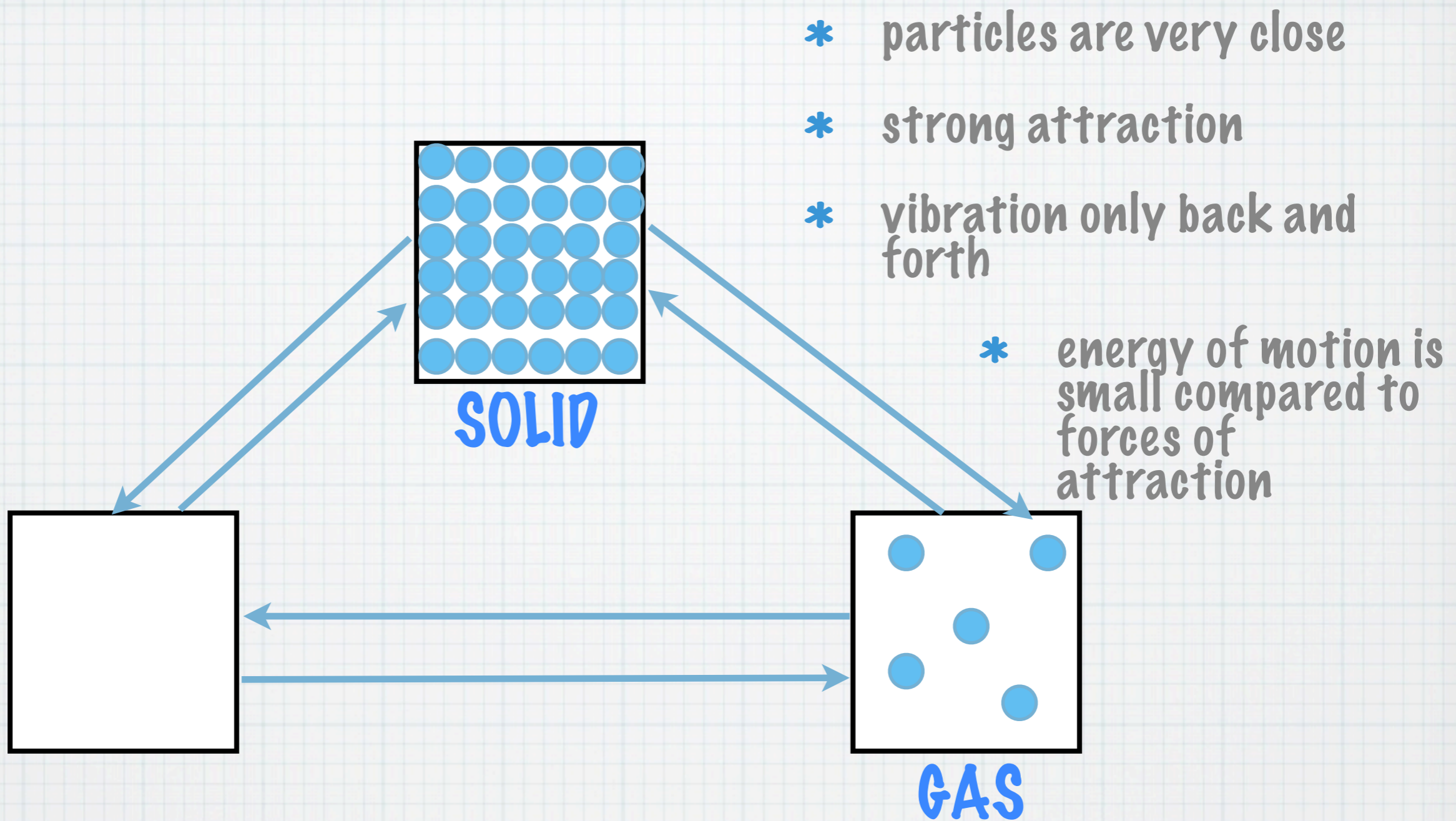
- Particles are furthest apart, have so much energy they fly apart.
- High energy
- Indefinite Shape. Take on the shape of container.
- Can be compressed.

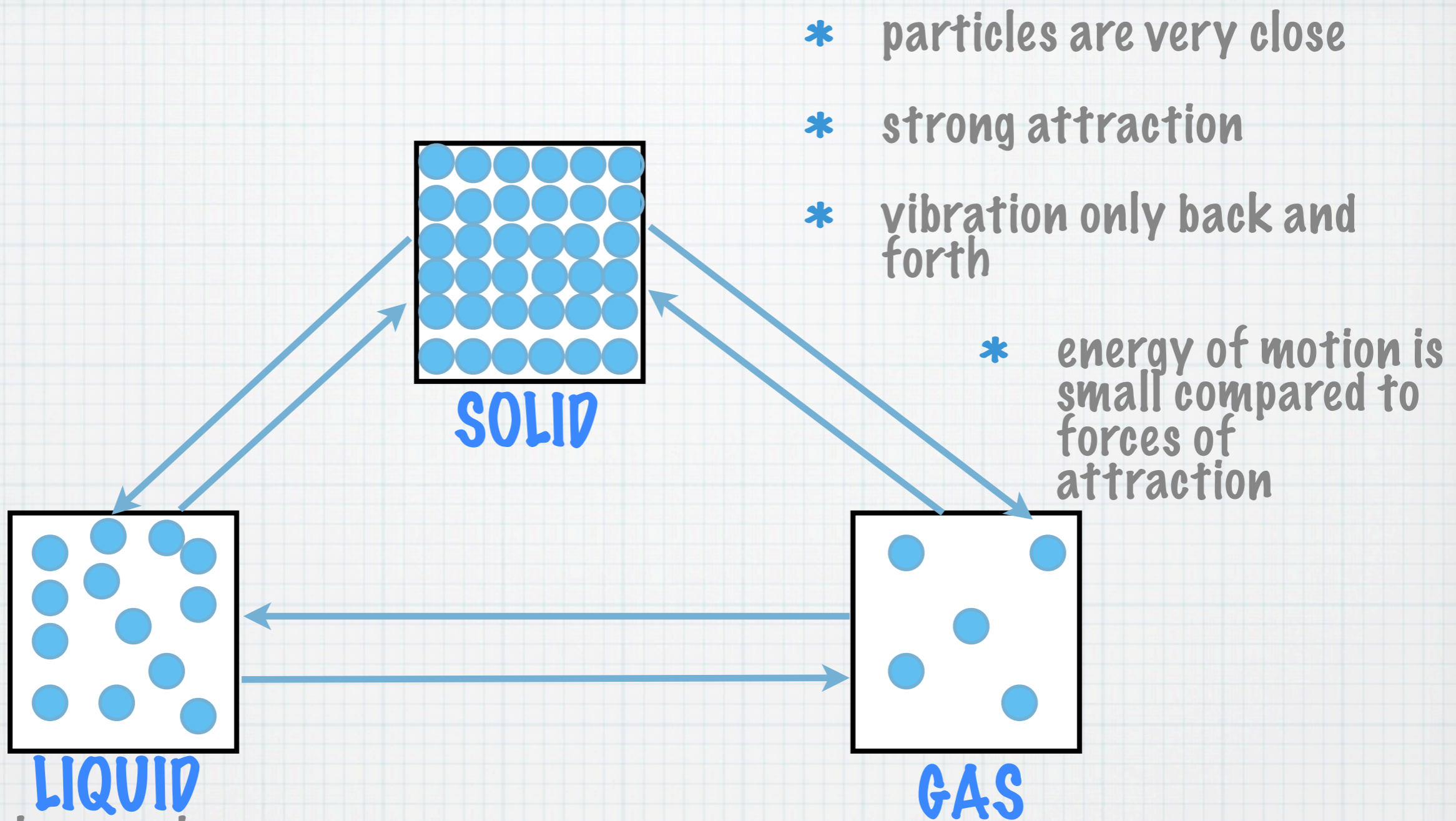


Changes in State





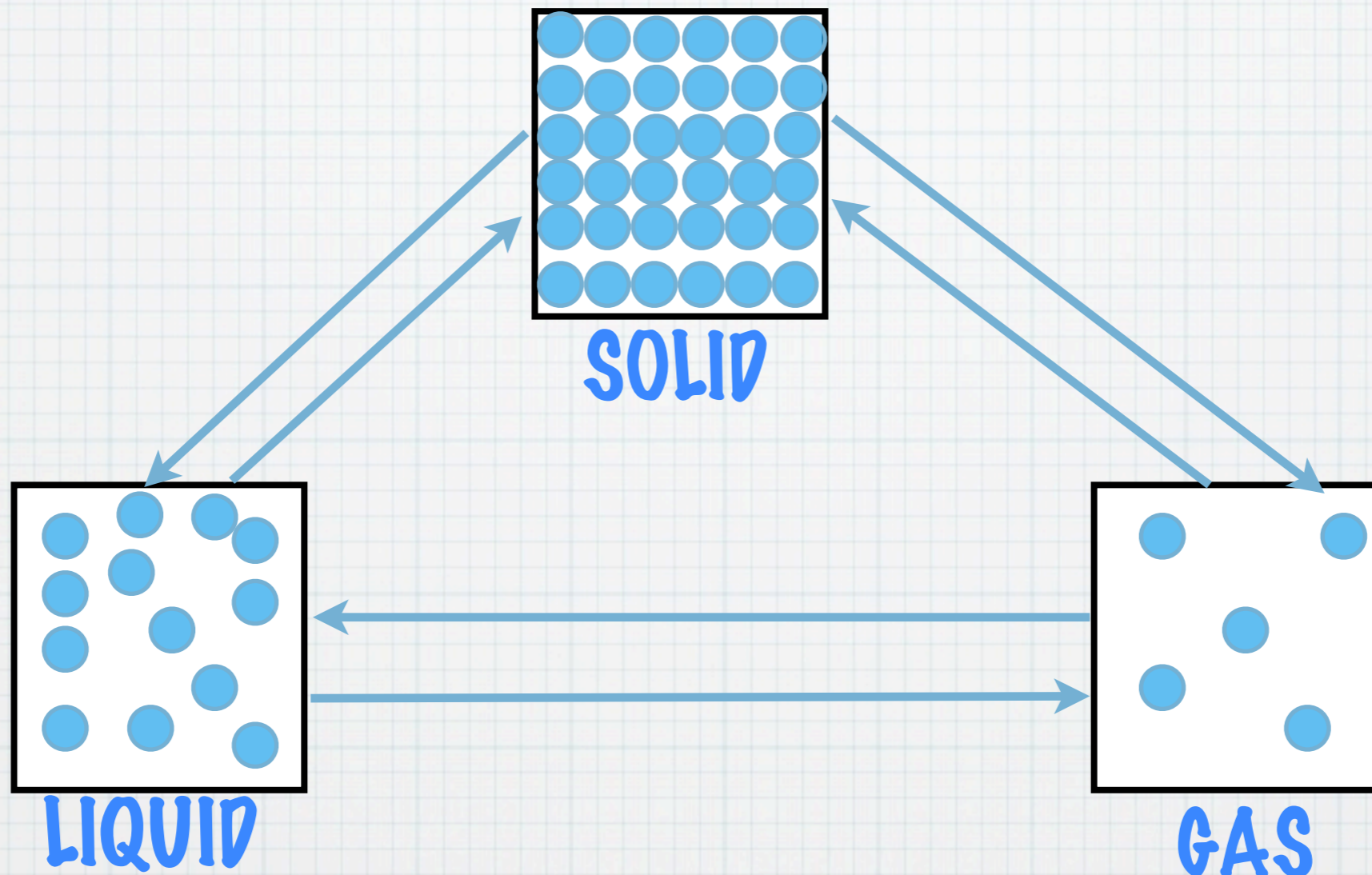




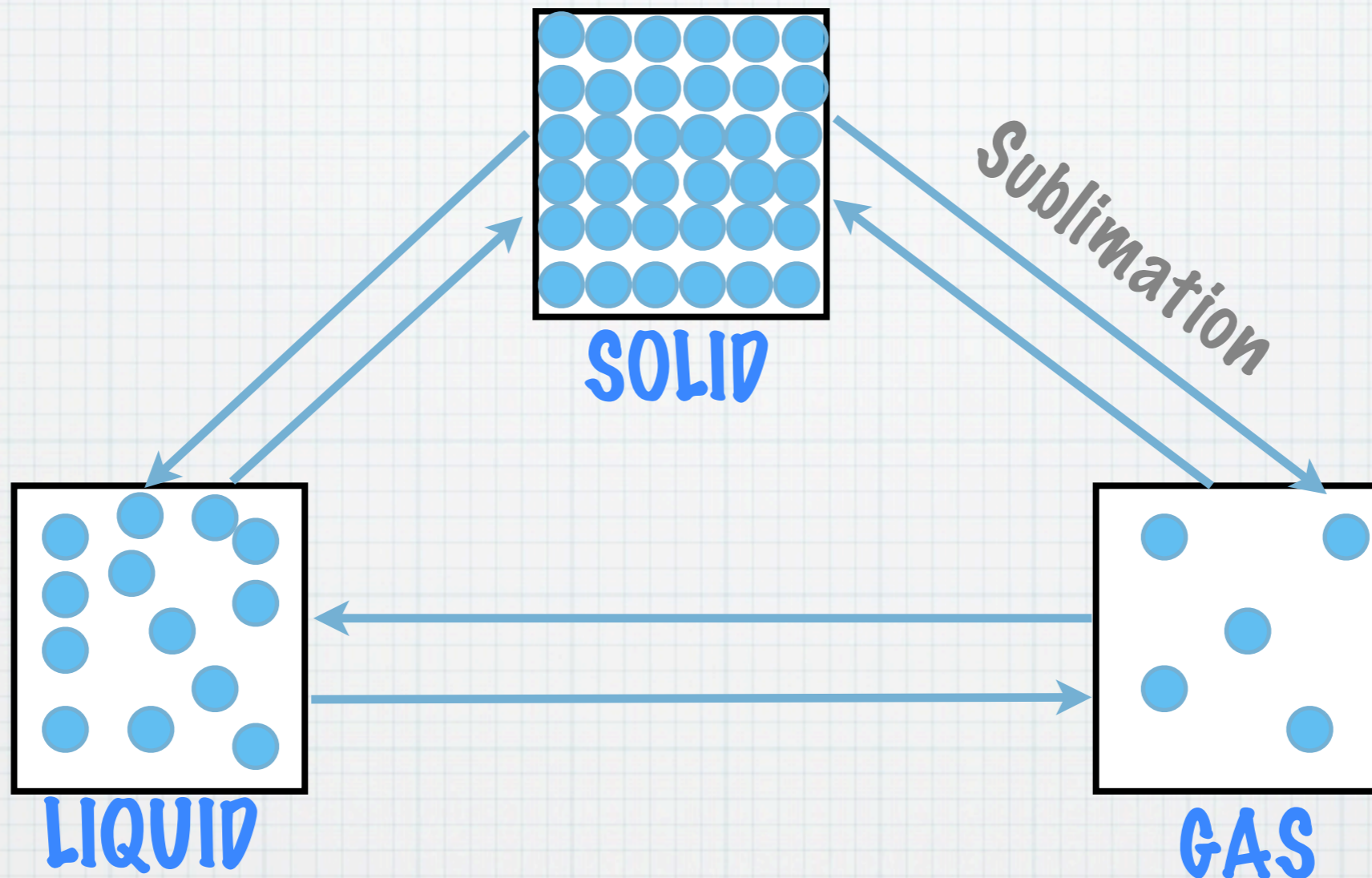
Changes in State

* Now lets see that in action...

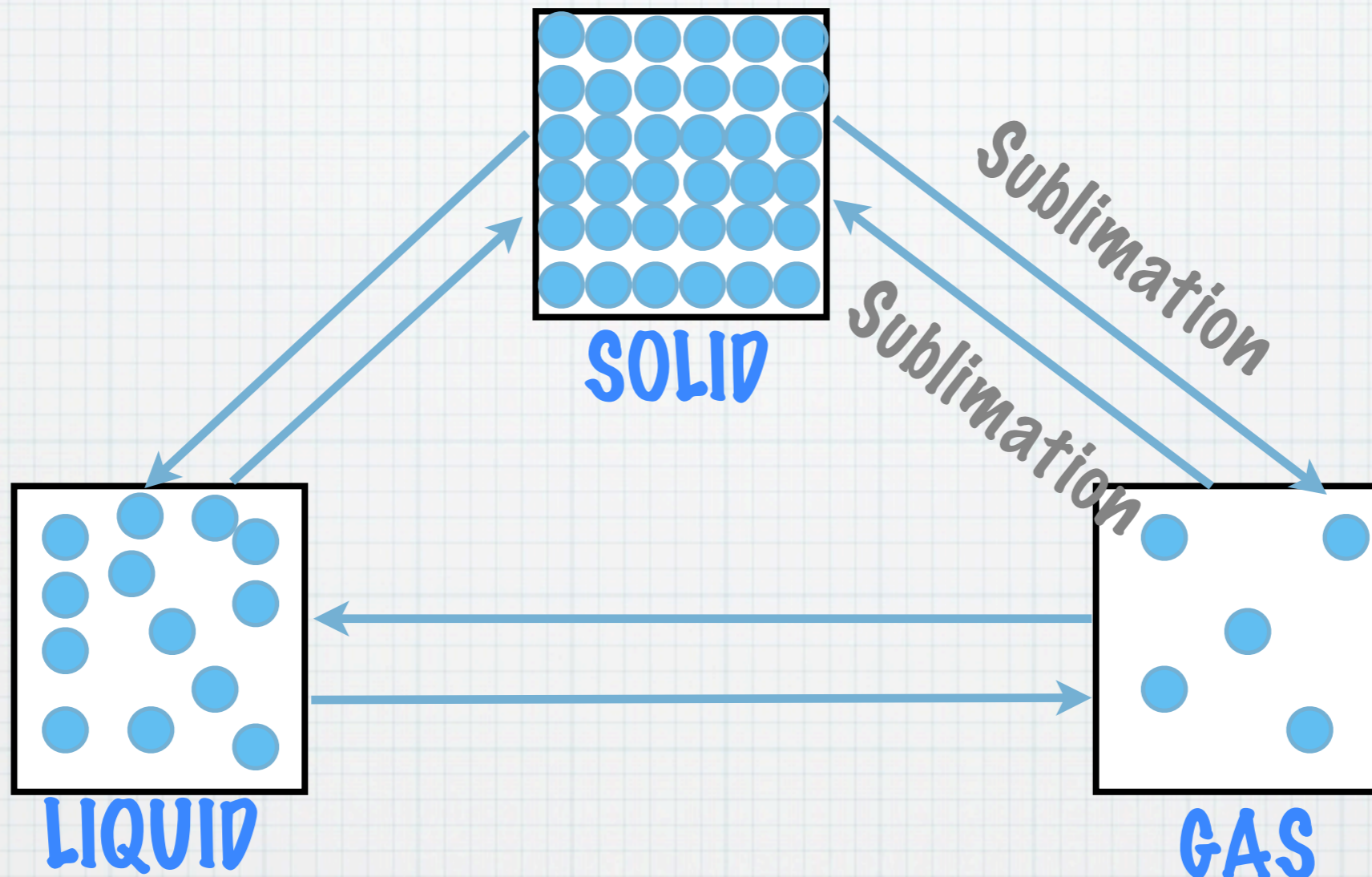
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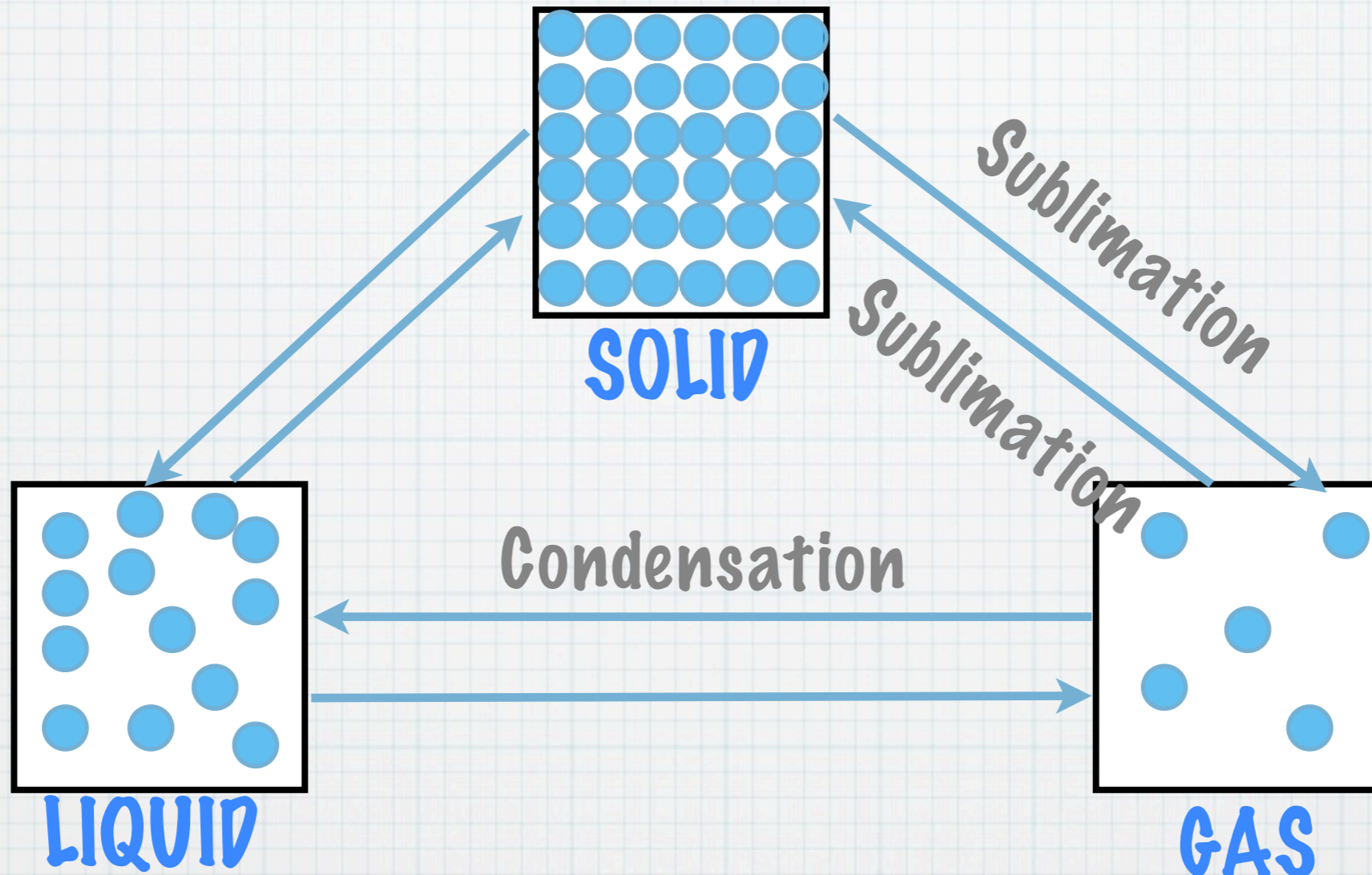
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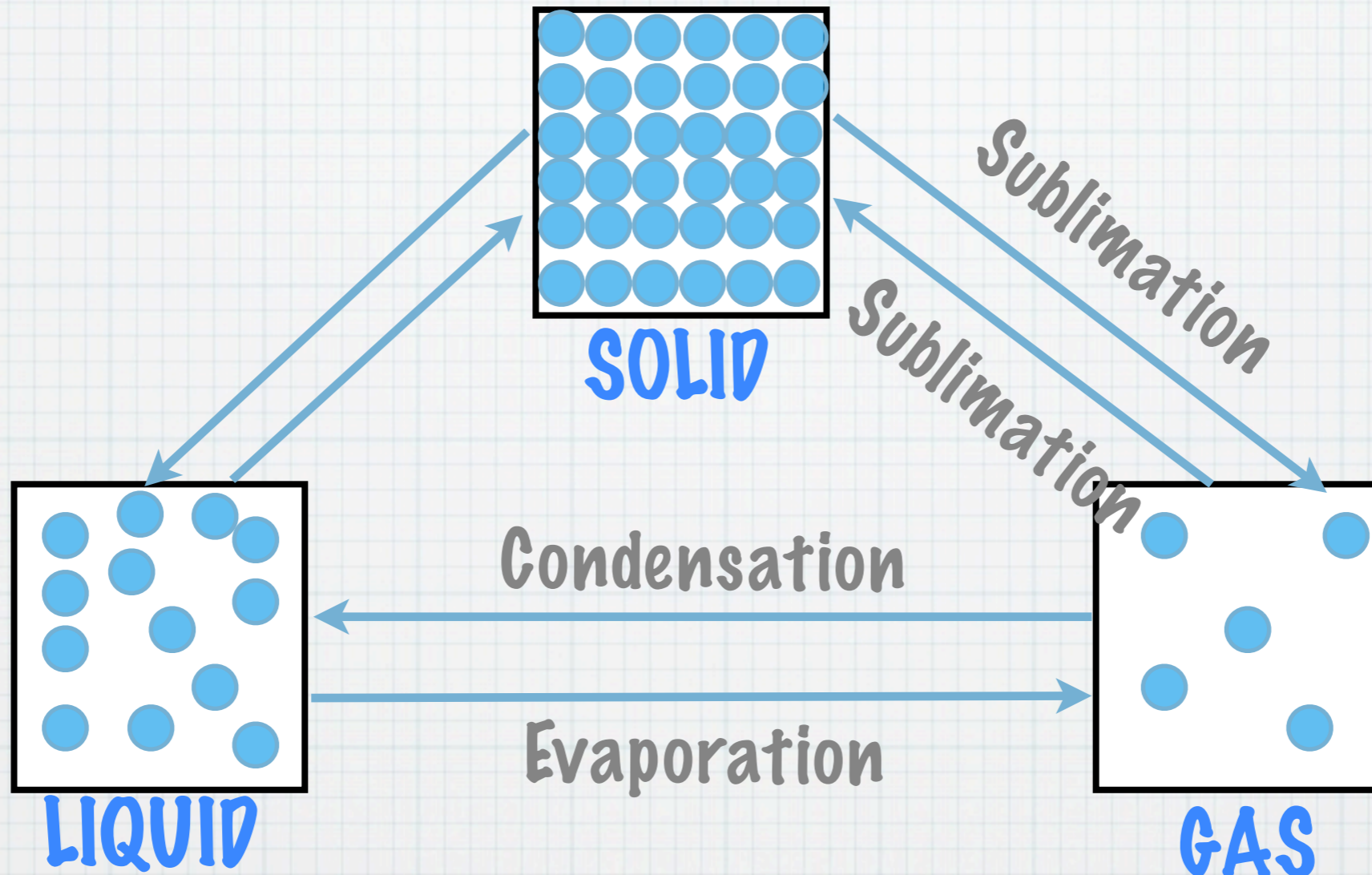
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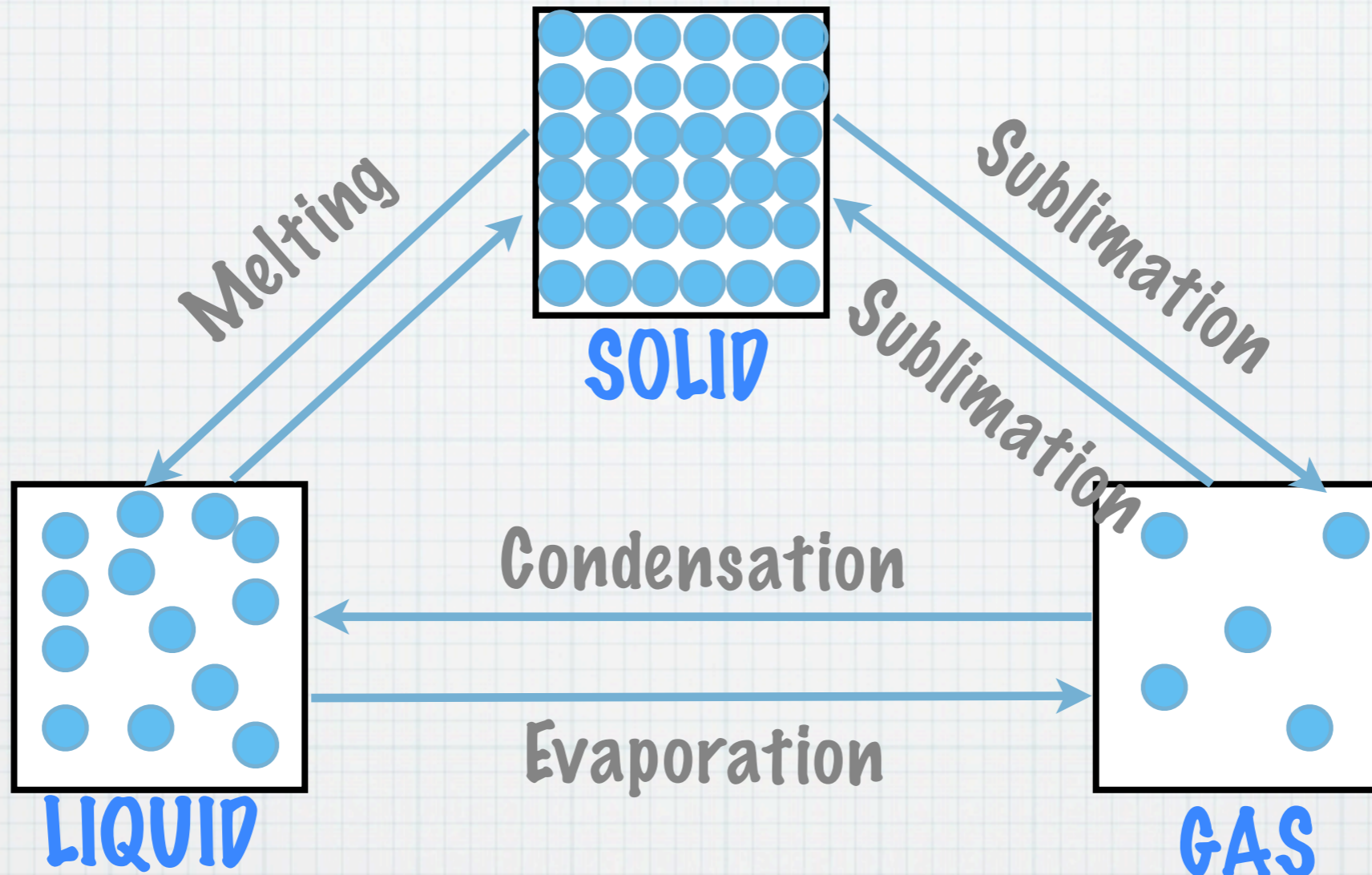
Changes in State



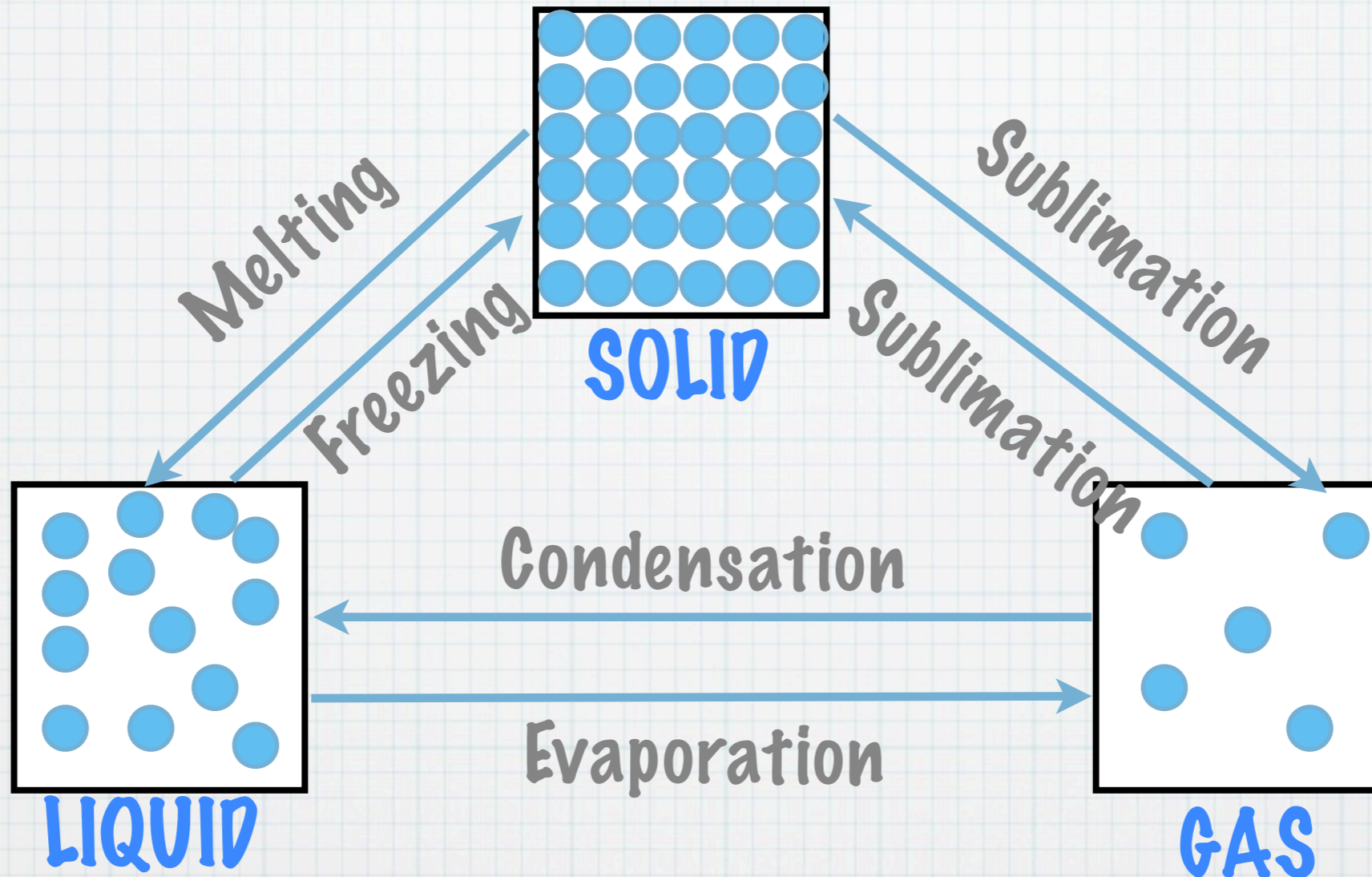
Changes in State



Changes in State



Changes in State



Changes in State

Initial State	Final State	Change of State	Heat Added or Removed
Solid	Liquid		
Solid	Gas		
Liquid	Gas		
Liquid	Solid		
Gas	Solid		
Gas	Liquid		

Changes in State

Initial State	Final State	Change of State	Heat Added or Removed
Solid	Liquid	Melting	Added
Solid	Gas	Sublimation	Added
Liquid	Gas	Evaporating	Added
Liquid	Solid	Freezing	Removed
Gas	Solid	Sublimation	Removed
Gas	Liquid	Condensation	Removed