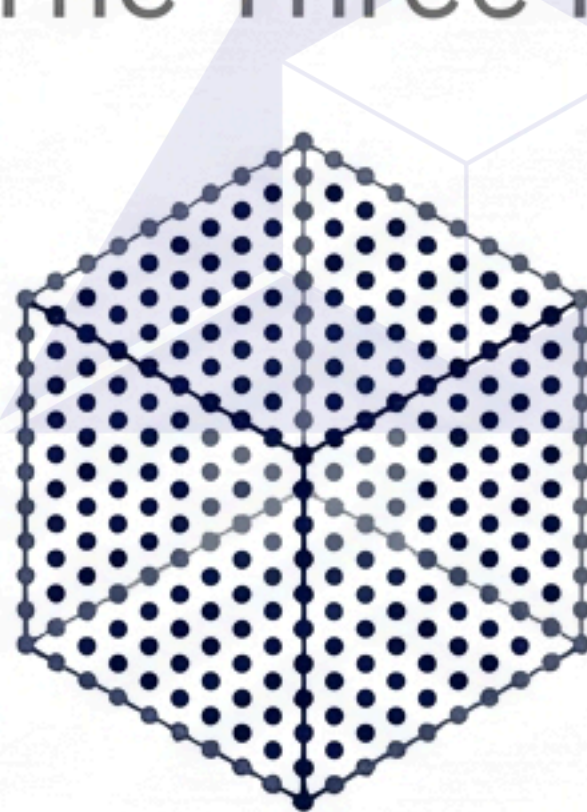


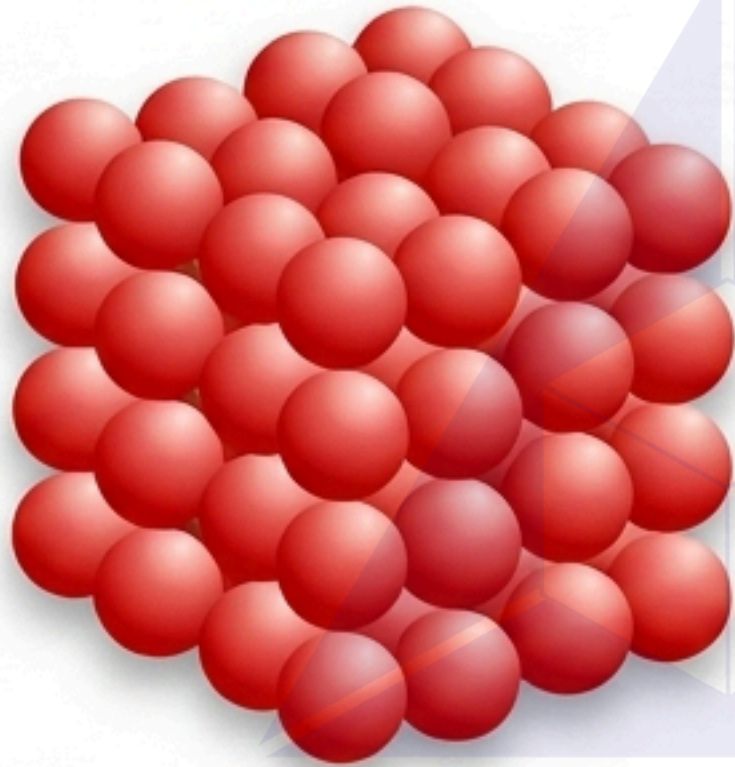
Basic Concepts of Chemistry

Solid, Liquid and Gas

The Three Primary States of Matter

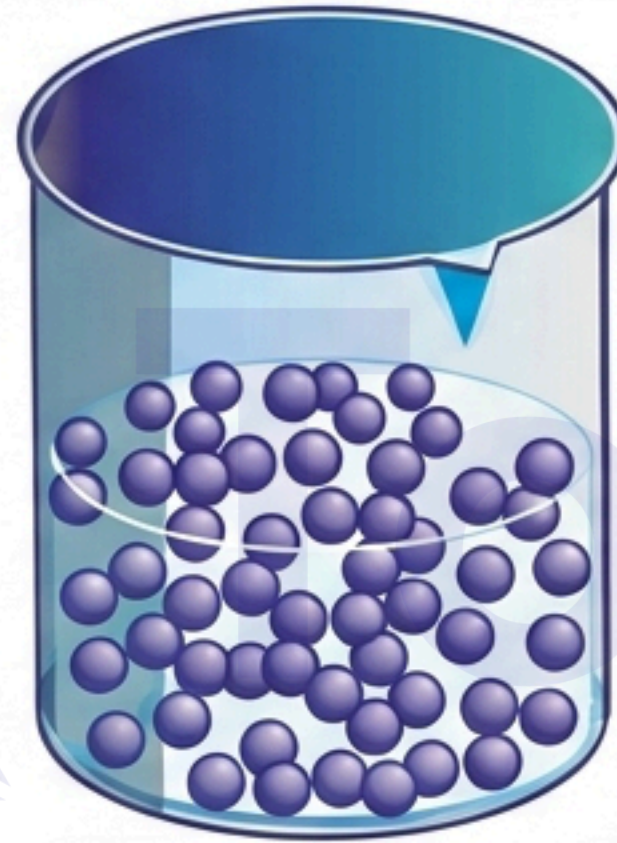


The Microscopic Arrangement of Matter



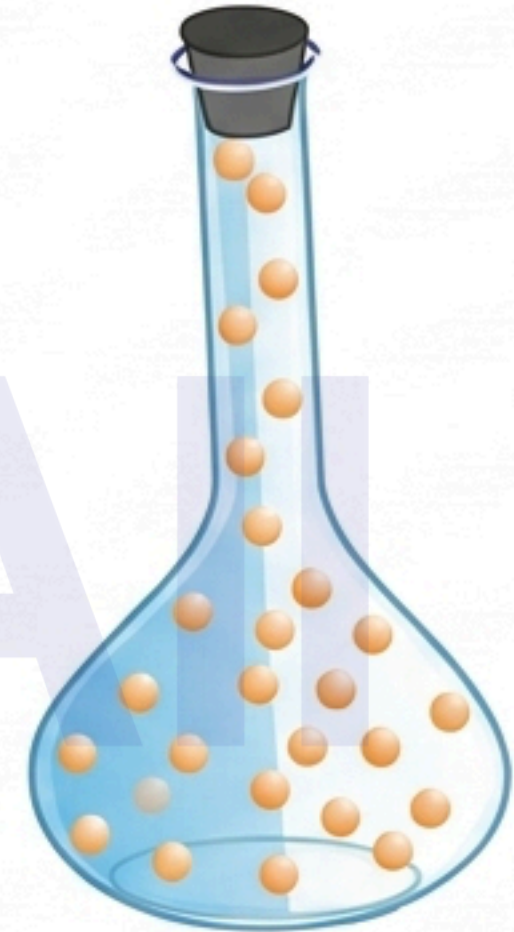
Solid

Particles held very close in an orderly fashion.



Liquid

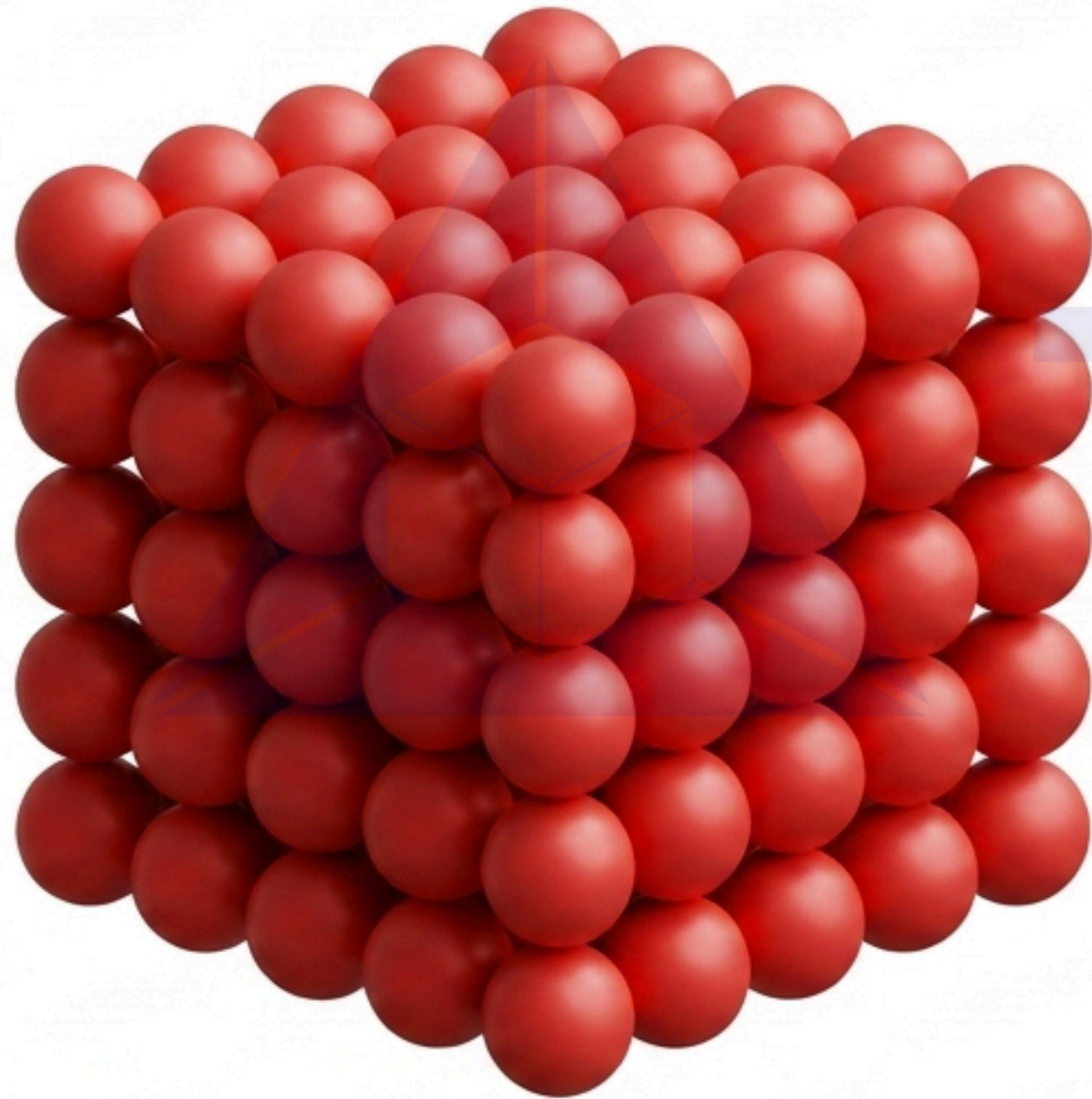
Particles close together but free to move around.



Gas

Particles far apart with easy, fast movement.

Solids: Definite Shape & Volume



VOLUME : Definite
SHAPE : Definite

Because constituent particles are locked into an orderly fashion, they have very little freedom of movement. This microscopic rigidity directly creates a macroscopic object that holds its own shape and takes up a fixed amount of space.

Restricted Movement

Particles vibrate but cannot translate.



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$$E=mc^2$$



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Liquids: Definite Volume, Indefinite Shape



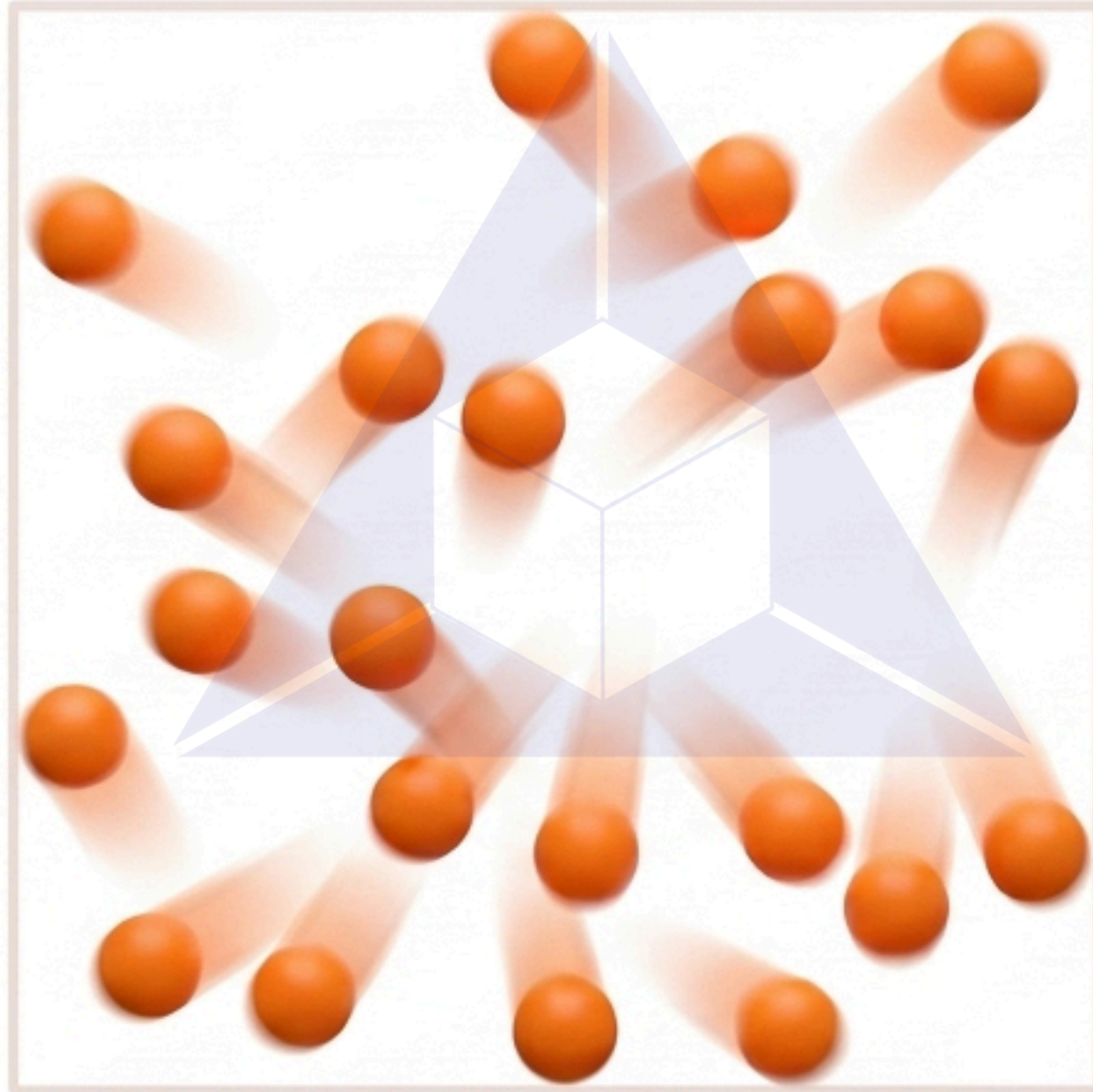
VOLUME : Definite
SHAPE : Indefinite

Particles remain physically close, maintaining a constant volume. However, because they are free to move around one another, a liquid cannot hold its own form.

Container Adaptation

Liquids conform completely to the shape of the vessel they are placed in.

Gases: No Definite Shape or Volume



VOLUME	: Indefinite
SHAPE	: Indefinite

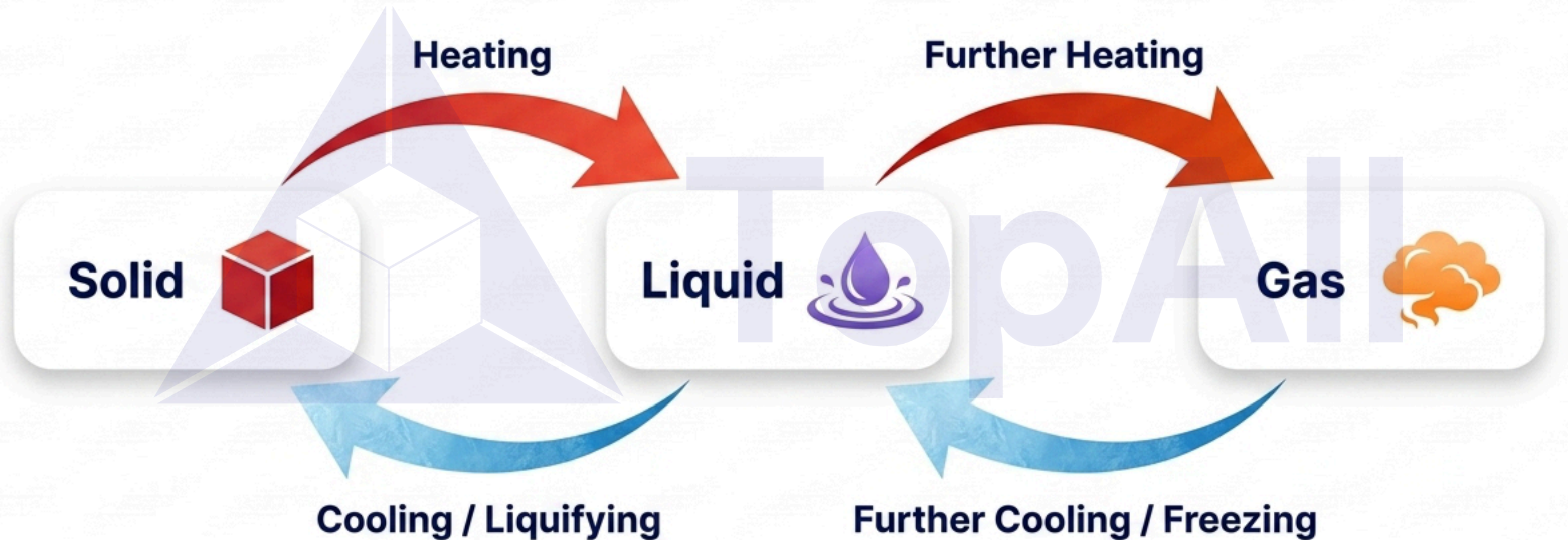
Gas particles are spaced vastly far apart relative to solids and liquids. Their movement is highly rapid and unconstrained.

Complete Expansion

A gas will completely occupy all available space within its container.

The Cycle of Interconversion

Solid $\rightleftharpoons$ Liquid $\rightleftharpoons$ Gas



The three states of matter are not permanent; they are entirely interconvertible depending on external conditions.

Key Takeaway



+



Temperature and Pressure Dictate the State.

The physical state of matter is simply a visible response to its environment. By altering the specific conditions of temperature and pressure, any substance can be forced to interconvert between a solid, liquid, or gas.

$$\Delta T + \Delta P = \text{STATE CHANGE}$$



You've Learned the Theory.

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