

THE KINETIC MOLECULAR THEORY (KMT)

Matter is made up of tiny particles that can't be seen with the naked eye. The particles are always MOVING.

The **kinetic molecular theory** describes how these particles behave in each state of matter and changes of state as well.

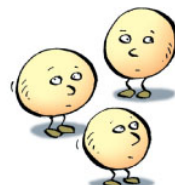
Solid → liquid
gas → solid

It's called the **KINETIC** Molecular Theory, because **KINETIC** energy = energy of Movement
(remember, the particles are always MOVING !)

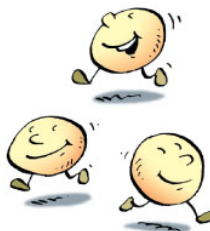
The Main Points of the Kinetic Molecular Theory (KMT):

1. All matter is made up of very small particles.
2. There is empty space between the particles.
3. Particles are attracted to one another.
4. Particles are constantly moving, and they collide with each other and the walls of the container.

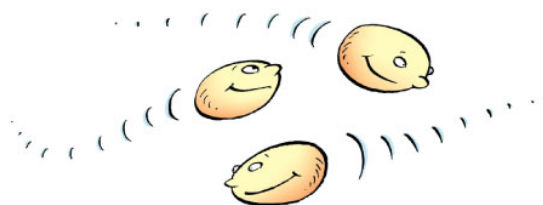
(a) Particles of a solid are so tightly packed together they cannot move around freely. They can only vibrate.



(b) Particles of a liquid are farther apart and they can move by sliding past each other.

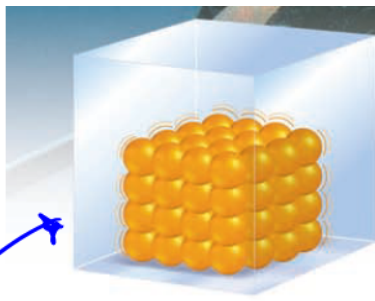


(c) Particles of a gas are very far apart and they move around quickly.



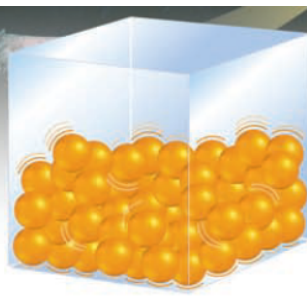
5. ENERGY makes particles move. The more energy particles have, the faster they move and the further apart they get.

still space between particles



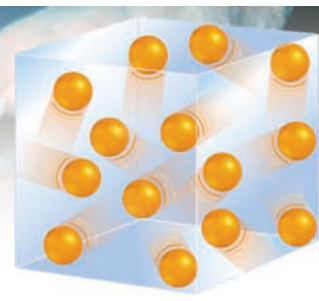
Solid

Figure 7.2A The particles in a solid are packed together tightly. This means that solids will hold a definite shape. Even though a solid does not appear to move, the particles are constantly vibrating in place.



Liquid

Figure 7.2B The particles in a liquid are in contact with each other, but they can slip and slide past one another, changing their position. This slipping and sliding means liquids take the shape of their container.



Gas

Figure 7.2C Gas particles have very large spaces between them. In fact, gases are mostly empty space. Gases are quite different from liquids and solids because the particles in a gas can move freely in all directions. This is why gases always spread out or diffuse in their container.

	SOLID	LIQUID	GAS
Takes the shape of its container? (yes/no)	NO	Yes	Yes
Fixed volume? (yes/no)	YES	Yes	NO
How are the particles moving?	Vibrating	Vibrating + bumping and sliding into each other	same
How much space is between the particles?	tightly packed	in between	Very far apart
How strong are the attractive forces between the particles?	Very Strong	Strong but.. less than Solids	None!
How much energy do the particles have? (low/medium/high)	Low	Medium	High
What is an example of something in this state of matter?	The chair we sit on	Water we drink	Oxygen in air

Homework: Key Words List: Define the terms **solid**, **liquid**, **gas**, **Kinetic Molecular Theory**