Reading Passage- Kinetic Particle Model

動粒模型（Kinetic Particle Model）用來解釋物質的行為，描述粒子如何移動和互相作用。所有物質都由不斷運動的微小粒子組成。粒子的運動程度取決於它們的能量以及物質所處的狀態。

在固體中，粒子緊密排列在固定位置，只能在原位振動，不能自由移動。當固體受熱時，粒子獲得能量並振動得更快，令固體膨脹。

在液體中，粒子仍然靠近，但不固定在位置上。它們能互相滑過，使液體能流動。當液體受熱時，粒子運動加快並稍微分散，令液體膨脹。

在氣體中，粒子相距很遠，並快速向各方向移動。它們會互相碰撞，也會撞擊容器壁，這些碰撞產生氣壓。當氣體受熱時，粒子獲得更多能量，移動更快，碰撞更頻繁，氣壓因而上升。

物質的狀態改變是因為粒子獲得或失去能量。當固體粒子獲得足夠能量脫離固定位置時，便會熔化。當液體粒子獲得足夠能量逃離液體表面時，便會沸騰成氣體。當粒子失去能量並靠得更近時，便會凝結或凝固。

The kinetic particle model explains the behaviour of matter by describing how particles move and interact. All matter is made of tiny particles that are constantly in motion. The amount of movement depends on the energy of the particles and the state of matter they are in.

In a solid, particles are packed closely together in fixed positions. They cannot move from place to place but vibrate about their positions. When a solid is heated, the particles gain energy and vibrate faster, which can cause the solid to expand.

In a liquid, particles are still close together but are not fixed in place. They can slide past one another, allowing liquids to flow. When heated, the particles move faster and spread out slightly, causing the liquid to expand.

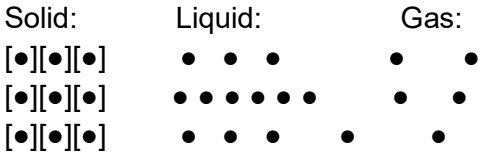
In a gas, particles are far apart and move rapidly in all directions. They collide with each other and with the walls of their container. These collisions create gas pressure. When a gas is heated, its particles gain more energy, move faster, and collide more frequently, increasing the pressure.

Changes of state occur when particles gain or lose energy. Melting happens when particles in a solid gain enough energy to break free from their fixed positions. Boiling occurs when particles in a liquid gain enough energy to escape and form a gas. Condensation and freezing happen when particles lose energy and move closer together.

Diagram

固體：粒子在固定位置振動
液體：粒子能互相滑過
氣體：粒子快速移動且距離遠

Kinetic Particle Model



Solid: particles vibrate in fixed positions
Liquid: particles slide past each other
Gas: particles move rapidly and far apart

Multiple Choice

1. 下列哪一項描述固體中的粒子？ A. 相距很遠並快速移動 B. 靠得很近並互相滑過 C. 固定在位置上但會振動 D. 隨機分散且作用力弱
2. 為何氣體容易被壓縮？ A. 粒子很重 B. 粒子之間距離很遠 C. 粒子在固定位置振動 D. 粒子之間吸引力很強
3. 當物質受熱時，粒子會： A. 失去能量並減慢 B. 獲得能量並加快 C. 完全停止運動 D. 變得更重
4. 氣壓是由以下哪項造成的？ A. 粒子在固定位置振動 B. 粒子互相滑過 C. 粒子撞擊容器壁 D. 粒子失去能量
5. 物質在何種情況下會熔化？ A. 粒子失去能量並靠得更近 B. 粒子獲得足夠能量脫離固定位置 C. 粒子停止振動 D. 粒子分散並快速移動

1. Which statement describes particles in a solid? A. Far apart and moving rapidly B. Close together and sliding past each other C. Fixed in place but vibrating D. Randomly spaced with weak forces
2. Why can gases be compressed easily? A. Their particles are very heavy B. Their particles are far apart C. Their particles vibrate in fixed positions D. Their particles are strongly attracted
3. What happens to particles when a substance is heated? A. They lose energy and slow down B. They gain energy and move faster C. They stop moving completely D. They become heavier
4. Gas pressure is caused by: A. Particles vibrating in fixed positions B. Particles sliding past each other C. Particles colliding with container walls D. Particles losing energy
5. Melting occurs when: A. Particles lose energy and move closer B. Particles gain enough energy to break free from fixed positions C. Particles stop vibrating D. Particles spread far apart and move rapidly

Structured Questions

6. 動粒模型描述了什麼？
7. 為何液體能流動而固體不能？
8. 密封容器中的氣體受熱時，為何氣壓會上升？
9. 比較固體、液體和氣體中粒子的間距。
10. 一位學生說：「固體中的粒子完全不會動。」解釋為何這說法不正確。

6. What does the kinetic particle model describe?
7. Why can liquids flow but solids cannot?
8. A sealed container of gas is heated. Explain why the pressure increases.
9. Compare the spacing of particles in solids, liquids, and gases.
10. A student says, “Particles in a solid do not move at all.” Explain why this is incorrect.

Answers

1. C 2. B 3. B 4. C 5. B
6. 動粒模型描述粒子在不同物態中如何移動和互相作用。
7. 液體粒子靠近但能互相滑過；固體粒子固定在位置上。
8. 氣體粒子受熱後動能增加，移動更快，與容器壁碰撞更頻繁且更用力，氣壓上升。
9. 固體粒子緊密排列；液體粒子靠近但可移動；氣體粒子距離很遠。
10. 固體粒子會在固定位置振動，並非完全靜止。

1. C 2. B 3. B 4. C 5. B
6. The kinetic particle model describes how particles move and interact in different states of matter.
7. Liquids can flow because their particles are close together but able to slide past each other; solids have fixed particles.
8. Heating gives gas particles more kinetic energy; they move faster and collide more often and with greater force, increasing pressure.
9. Solids have tightly packed particles; liquids have close but movable particles; gases have particles far apart.
10. Particles in a solid vibrate in fixed positions; they are not completely still.