States of Matter and the Particle Model

Ages 11–14 · Science

Name _____ Class _____ Date _____

A Key terms: match each term to its meaning

Write the letter of the correct meaning in the box next to each term.

1	**Matter**	☐	**A** The change from gas to liquid, which gives out energy.
2	**Particle model**	☐	**B** Anything that has mass and takes up space.
3	**Melting**	☐	**C** A liquid turning into a gas at its surface, at any temperature below the boiling point.
4	**Condensing**	☐	**D** The temperature at which a liquid turns into a gas throughout; for pure water at sea level it is 100 °C.
5	**Evaporation**	☐	**E** The change from solid straight to gas without becoming a liquid.
6	**Boiling point**	☐	**F** The change from solid to liquid, which takes in energy.
7	**Sublimation**	☐	**G** The spreading of particles from where there are many of them to where there are fewer.
8	**Diffusion**	☐	**H** The idea that all matter is made of tiny moving particles, used to explain the properties of solids, liquids and gases.

B Quick quiz

Circle the best answer, write its letter, then explain your choice in a few words.

1 Which description matches the particles in a liquid?

a) Far apart and moving quickly in all directions
b) Close together, in no regular pattern, moving past each other
c) Tightly packed in a regular pattern, vibrating in place
d) Not moving at all

Answer: _____ Why? _____

2 What is the name for a gas turning straight into a solid?

a) Condensing
b) Freezing
c) Deposition
d) Evaporation

Answer: _____ Why? _____

3 Ice is heated steadily. What happens to the temperature while it is melting?

a) It rises quickly
b) It stays the same until all the ice has melted
c) It falls
d) It rises and falls in turns

Answer: _____ Why? _____

4 Which statement about evaporation is correct?

a) It only happens at 100 °C
b) It happens throughout the whole liquid
c) It happens at the surface at any temperature
d) It gives out energy to the liquid

Answer: _____ Why? _____

5 A sealed can of gas is heated. Why does the pressure inside rise?

a) The gas particles get bigger
b) New particles are made
c) The particles move faster and hit the walls harder and more often
d) The particles stop moving and stick to the walls

Answer: _____ Why? _____

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Answer key for teachers · Ages 11–14 · Science

A Key terms

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2	**Particle model**	H	The idea that all matter is made of tiny moving particles, used to explain the properties of solids, liquids and gases.
3	**Melting**	F	The change from solid to liquid, which takes in energy.
4	**Condensing**	A	The change from gas to liquid, which gives out energy.
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8	**Diffusion**	G	The spreading of particles from where there are many of them to where there are fewer.

B Quick quiz

1 **b) Close together, in no regular pattern, moving past each other**
Liquid particles are close together but jumbled, and they slide past each other. That is why liquids flow but are very hard to squash.

2 **c) Deposition**
Deposition is gas to solid with no liquid stage. The opposite change, solid straight to gas, is sublimation, as with dry ice.

3 **b) It stays the same until all the ice has melted**
During a change of state the energy taken in goes into separating the particles, not into raising the temperature, so it stays at the melting point until all the ice has melted.

4 **c) It happens at the surface at any temperature**
Evaporation happens at the surface of a liquid at any temperature, when the fastest-moving particles escape. Boiling happens throughout the liquid, only at the boiling point.

5 **c) The particles move faster and hit the walls harder and more often**
Heating gives the particles more energy, so they move faster and collide with the walls harder and more often. The particles themselves do not change size and no new particles appear.