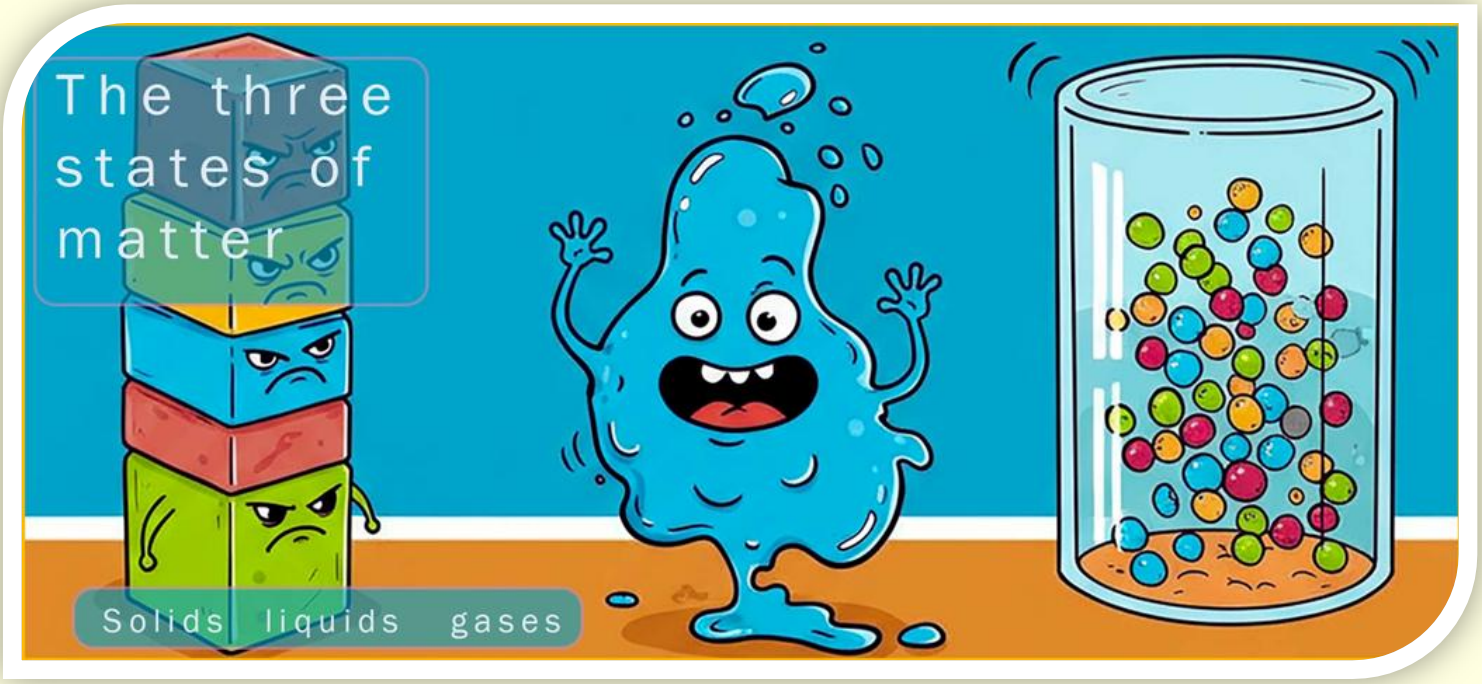
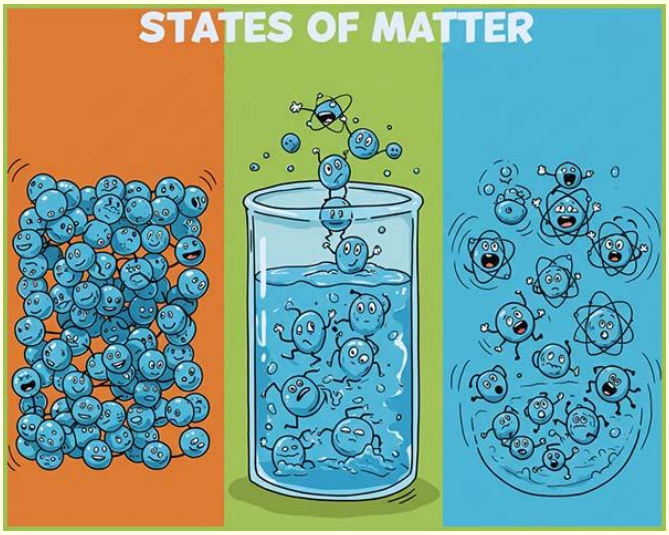


Answer all the questions below then check your answers.

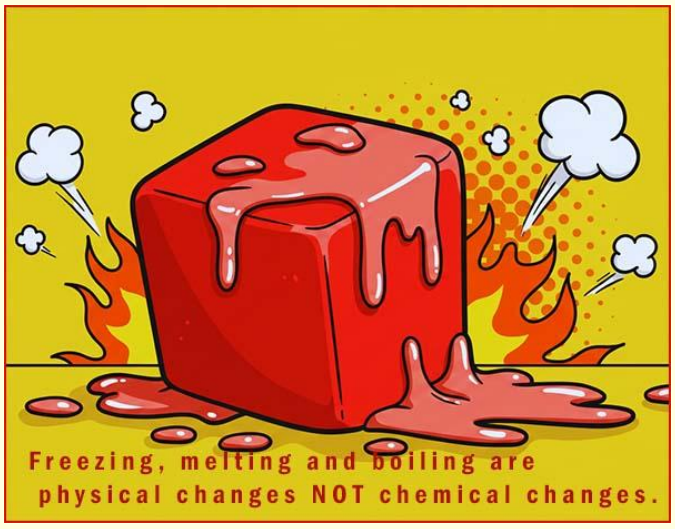


1. Which state of matter has a fixed shape and volume?
2. In which state of matter do particles have the highest amount of kinetic energy?
3. What is the name of the change of state from liquid to gas?
4. Describe the arrangement of particles in a solid.
5. Which state of matter can easily change its shape to fill a container?
6. Does the mass of a substance change during a change of state?
7. What is the term for a change of state directly from solid to gas?
8. Explain why a liquid is able to flow.

9. Name the two changes of state that involve a decrease in the energy of the particles.

10. Draw simple particle diagrams to represent a substance in its solid, liquid, and gas states.

11. Describe the movement of particles in a gas.



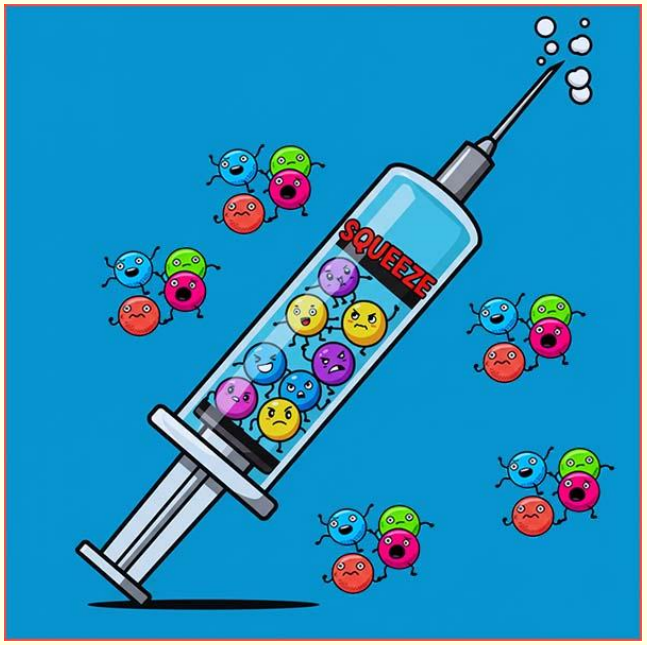
12. A substance has a melting point of -20°C. Will it be a solid or a liquid at -10°C? Explain.

13. What happens to the forces between particles when a substance boils?

14. A substance has a melting point of 10°C and a boiling point of 80°C. What state will it be at 50°C? Explain your answer.

a. A substance has a melting point of -20°C. Will it be a solid or a liquid at -10°C? Explain.

15. Substance A has a melting point of 50°C and Substance B has a melting point of 20°C. If both start as solids at room temperature (25°C), explain which will melt first when heated and why.



16. Explain, in terms of the particle model, why a gas can be compressed but a solid cannot.

17. A puddle of water dries up on a warm day. Describe what happens to the water particles in terms of changes of state and particle movement.

Answers

1. Which state of matter has a fixed shape and volume?

   Solid

2. In which state of matter do particles have the highest amount of kinetic energy?

   Gas

3. What is the name of the change of state from liquid to gas?

   Boiling or evaporation

4. Describe the arrangement of particles in a solid.

   Closely packed in a regular pattern

5. Which state of matter can easily change its shape to fill a container?
   Liquid
6. Does the mass of a substance change during a change of state?
   No

7. What is the term for a change of state directly from solid to gas?

   Sublimation

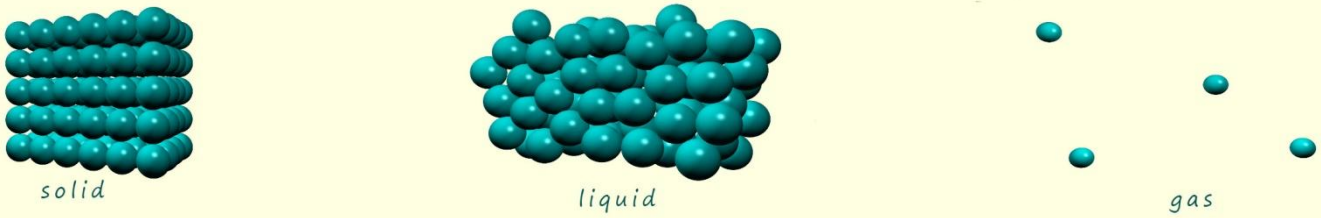
8. Explain why a liquid is able to flow.

   Particles are close together but can slide past each other

9. Name the two changes of state that involve a decrease in the energy of the particles.

Condensation and freezing

10. Draw simple particle diagrams to represent a substance in its solid, liquid, and gas states.



solid: Tightly packed, regular rows. *Liquid:* Close together, random arrangement. *Gas:* Widely spaced, random arrangement

11. Describe the movement of particles in a gas.
Particles move in random directions at high speeds.
12. A substance melts at -20°C. Will it be a solid or a liquid at -10°C? Explain.
Liquid, since -10°C is above its melting point.

13. What happens to the forces between particles when a substance boils?

The forces between particles are overcome.

14. A substance has a melting point of 10°C and a boiling point of 80°C. What state will it be at 50°C? Explain your answer.

Liquid. 50°C is above the melting point but below boiling point

a. A substance melts at -20°C. Will it be a solid or a liquid at -10°C? Explain.
Liquid, since -10°C is above its melting point.

15. Substance A has a melting point of 50°C and Substance B has a melting point of 20°C. If both start as solids at room temperature (25°C), explain which will melt first when heated and why.

Substance B will melt first because its melting point (20°C) is lower than room temperature, while Substance A's melting point is higher.

16. Explain, in terms of the particle model, why a gas can be compressed but a solid cannot.

Solids: Particles are already tightly packed; little space to move closer together.
Gases: Particles have large spaces between them; these spaces can be reduced when compressed.

17. A puddle of water dries up on a warm day. Describe what happens to the water particles in terms of changes of state and particle movement.

The water evaporates (liquid to gas). Particles gain energy, overcome forces holding them together, and move further apart into the air.