SCIENCE FUSION Physical Science

HOLT McDOUGAL

PowerNotes

Unit 1 **Lesson 5** States of Matter

Particles in Motion

How do particles move in solids, liquids, and gases?

- The *kinetic theory of matter* states that all matter is made of tiny particles that are in constant motion.
- The state of matter is determined by how much particles move and how often they bump into each other.

How do particles move in solids, liquids, and gases?

- A **solid** is a substance with a definite volume and shape. Particles are close together and do not move freely.
- A **liquid** is a substance with a definite volume but not a definite shape.
- A **gas** is a substance that does not have a definite volume or shape.

Shape Up!

How does particle motion affect the properties of solids, liquids, and gases?

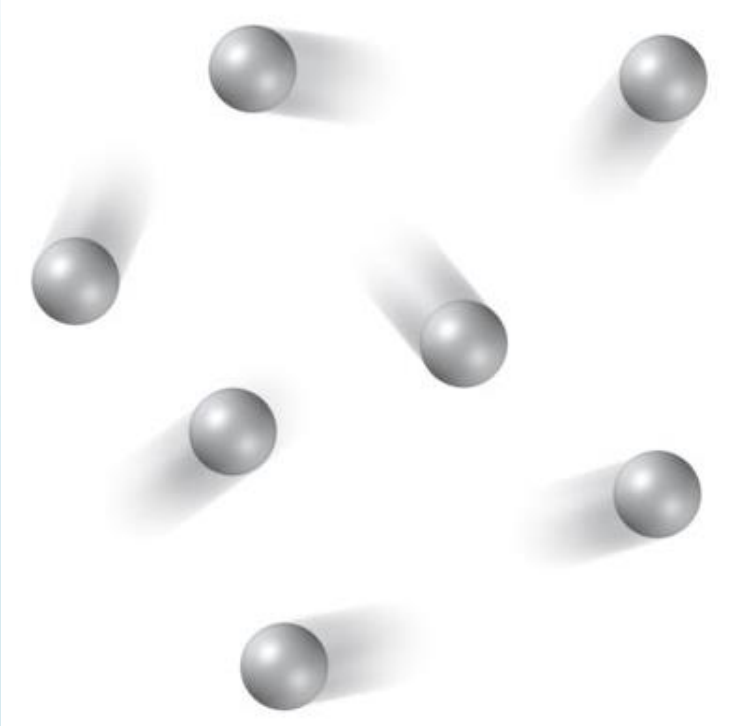
- Particles in a solid vibrate but remain in fixed positions.
- Solids cannot easily change shape or volume.
- Liquids take the shape of their container. Particles in a liquid are close together but not tightly arranged.

How does particle motion affect the properties of solids, liquids, and gases?

- Particles in liquids slide past each other, creating flow.
- Particles in gases are far apart.
- The space between gas particles can change easily.
- Gases take on the shape of their container.

How does particle motion affect the properties of solids, liquids, and gases?

- What state of matter is shown in the image below? How do you know?



What happens when substances change state?

- The process in which a solid becomes a liquid is called *melting.*
- As a solid is heated, if the vibrations in the particles are fast enough, the particles break loose and slide past one another.

What happens when substances change state?

- When temperatures of a liquid are lowered, causing a solid to form, it is called *freezing.*

- Lower temperatures cause the particles to move slowly enough for the attractions between them to cause the liquid to become a solid.

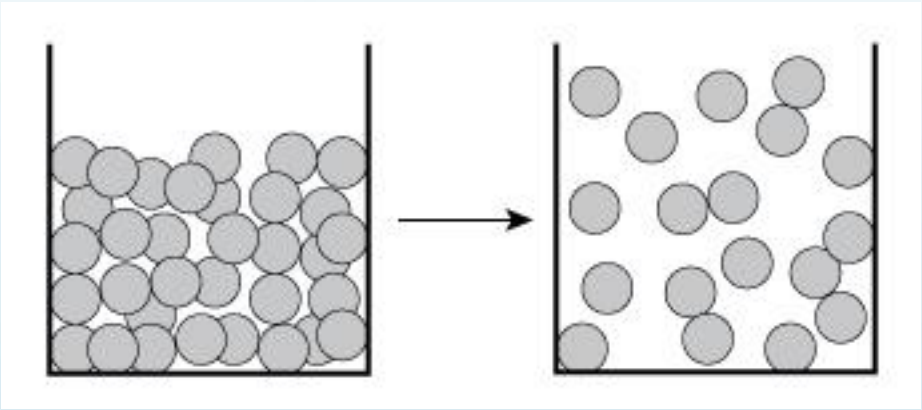
What happens when substances change state?

- Water freezes at 0 ° C, but other substances can freeze at room temperature.

- When substances lose or gain energy, one of two things can happen to the substance: its temperature can change or its state can change.

What happens when substances change state?

- What change of state is happening in this diagram?



Making Glass

- Glass blowing is the shaping of glass by blowing air into a blob of molten glass from the end of a blowpipe.
- Glass is made by heating a mixture of sand, soda ash, limestone, and other ingredients until it melts.
- Melted glass can be cooled, and it will change to the solid state.