

KEY

STATES OF MATTER PhET

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PREDICTIONS

Answers will vary

1. Draw 10 particles of a solid, liquid and gas substance. Your drawing should consider the spacing between particles.



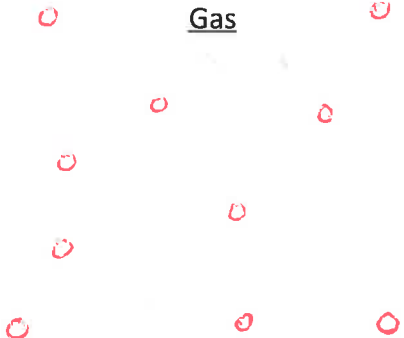
<u>Solid</u>	<u>Liquid</u>	<u>Gas</u>

2. In which state of matter are the particles moving the fastest?
3. Is there a state of matter in which the particles are not moving at all?

EXPERIMENT

Test your predictions using this [simulation](#) (click **States**).

1. Draw 10 particles of a solid, liquid and gas substance. Your drawing should consider the spacing between particles.

<u>Solid</u>	<u>Liquid</u>	<u>Gas</u>
		

2. Describe the relative **motion (speed)** of the particles in each phase.

Solid: *vibrate in place*

Liquid: *freedom to move around each other*

Gas: *move quickly and fill container*

PHASE CHANGES

PREDICTIONS

Answers will vary.

1. How does adding energy to a solid affect the motion of the particles?

Particles move more quickly and spread out as they change phases (states)

2. How can a gas at room temperature (like oxygen) become solid?

Remove energy from the gas (cool it)

EXPERIMENT

Test your predictions using this [simulation](#) (click **States**).

1. Start with solid Argon and explain how to make Argon change to the liquid state and then to the gaseous state.

Add energy (heat the particles)

2. Start with gaseous Argon and explain how to make the Argon change to the liquid state and then to the solid state.

Remove energy (cool the particles)

3. Explain how the absorption of energy (heating) affects the speed of the particles in a substance.

Particles' speed increases

4. Explain how the release of energy (cooling) affects the speed of the particles in a substance.

" Speed decreases

5. Can you make the particles of any of the substances stop moving?

In the simulation you can, but in reality,

MAKING CONNECTIONS

absolute zero (0 Kelvin) is probably impossible. Particles always have some

1. When you apply heat energy to a substance, where does the energy go? Think about the law of conservation of energy.

The energy goes into the particles, increasing their kinetic energy.

energy (movement)