

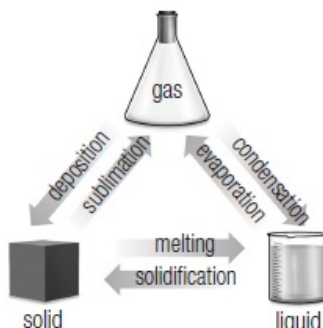
Science 7
Unit 2: Heat and Temperature
Topic 4: The Particle Theory And Changes In State of Matter



Student Name: _____

Changes Of State And The Particle Theory

According to the particle theory, particles with more energy move faster. One way to add energy is to heat it. The amount of energy gain or lost can affect the state of matter in six ways:



1. Melting: the change of state from a solid to a liquid. As a solid is heated, the particles start to move faster until they have enough energy to break away from their fixed positions. As a result the particles can move more freely.

2. Solidification (Freezing): The change of state from a liquid to a solid. Here, the particles in the liquid lose energy due to the lowering of temperature. The particles start to move slower and the attraction between the particles starts to increase. The liquid eventually becomes frozen or solidified.

3. Evaporation: the change of a liquid to a gas. Here a liquid is heated, the particles move about more and more quickly. Some particles gain enough energy to break free of the attraction of other particles.

4. Condensation: the change of a gas to a liquid. Here the particles are cooled. As a result the particles start to move slower and the attraction between the particles starts to increase. It is the reverse process of evaporation.

5. Sublimation: The change of state from a gas to a solid, without passing through the liquid phase.

6. Deposition: occurs when a gas becomes a solid without going through the liquid state of matter.

CHANGE	FROM	TO	EXAMPLE
Sublimation	solid	gas	Moth crystals disappear when left in a closet for several days
Deposition	gas	solid	frost forms on a car's windshield
Melting	solid	liquid	An ice cube turns into water when left out of the freezer
Solidification (Freezing)	liquid	solid	bottle of water will turn into ice if left in the freezer
Condensation	gas	liquid	Drops of water form on the mirror when taking a hot shower
Evaporation	liquid	gas	Rain dries up when the sun comes out

PART A: MULTIPLE CHOICE.

Instruction: Circle the correct answer below each question. Also, transfer your answers to the bubble sheet provided.

1. Which of the following is NOT a way that matter changes state?
 - (A) Melting
 - (B) Freezing
 - (C) Evaporation
 - (D) Mixing

2. Matter changing from a solid to a liquid is called:
 - (A) Evaporation
 - (B) Sublimation
 - (C) Deposition
 - (D) Melting

3. Matter changing from a solid to a gas is called:
 - (A) Evaporation
 - (B) Sublimation
 - (C) Deposition
 - (D) Melting

4. Evaporation occurs when
 - (A) Gas changes to liquid
 - (B) Gas changes to solid
 - (C) Liquid changes to solid
 - (D) Liquid changes to gas

5. Sublimation occurs when
 - (A) Solid changes to gas
 - (B) Gas changes to solid
 - (C) Solid changes to liquid
 - (D) Liquid changes to solid

6. Deposition occurs when
 - (A) Liquid water becomes ice
 - (B) Ice becomes water vapour
 - (C) Liquid water becomes water vapour
 - (D) Water vapour becomes ice

7. Condensation occurs when
 - (A) A liquid is cooled
 - (B) A gas is cooled
 - (C) A liquid is heated
 - (D) A gas is heated

8. Melting occurs when
 - (A) A solid is heated
 - (B) A liquid is heated
 - (C) A gas is heated
 - (D) All of the above

9. Solidification occurs when

- (A) A liquid is cooled
- (B) A gas is cooled
- (C) A liquid is heated
- (D) A gas is heated

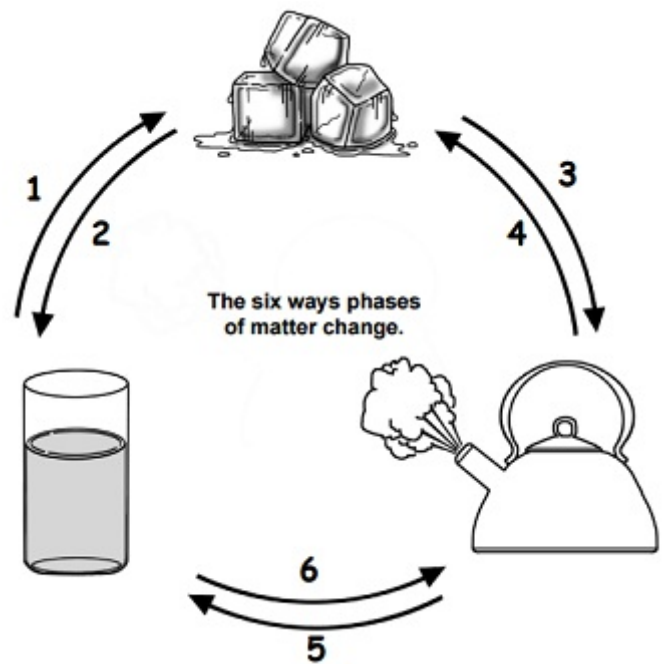
10. When you heat a sample of a solid, the particles that make up the solid:

- (A) Get bigger
- (B) Loose mass
- (C) Move faster
- (D) Slow down

PART B WRITTEN RESPONSE

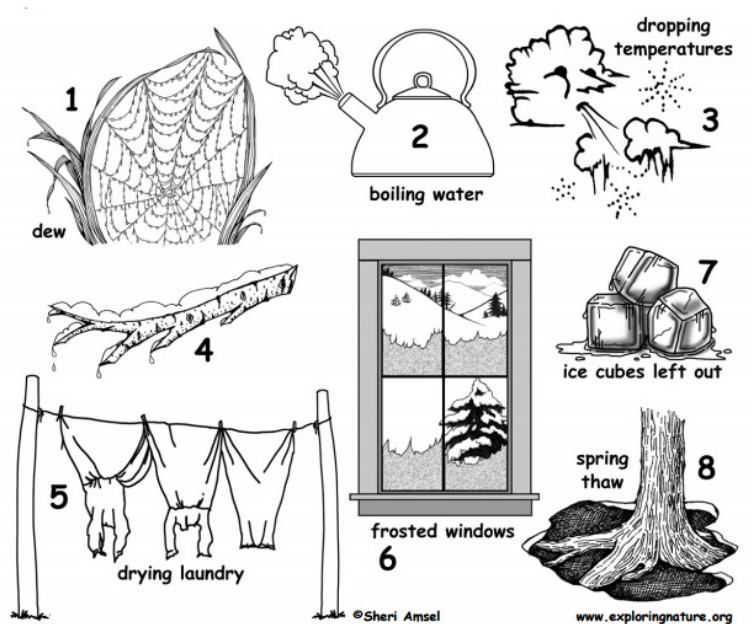
1. Name the six ways the phase (state) of matter changes:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



2. Write the correct term to describe the state change of water shown in each of the pictures. Note, you will use some terms more than once and some not at all.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____



3. Use the spaces below to explain whether heat is being added or released. Also, describe how the state of the water changes.

Term	Is heat added or released?	Change in state from _____ to _____
1. evaporation		
2. melting		
3. condensation		
4. solidification		
5. deposition		
6. sublimation		

4. Explain the meaning of the phrase “change of state.”

5. What change of state is opposite to:

(a) evaporation _____

(b) melting _____

(c) deposition _____

6. Describe evaporation using the particle theory of matter.

7. Use the particle theory to explain melting.

8. How does sublimation differ from evaporation?
