

# Phase Changes



## Vocabulary

### **condensation**

(kon den SAY shuhn)  
process of changing from  
a gas to a liquid

## Using Science Words

1. During condensation, a gas changes to a \_\_\_\_\_.
  - A. solid
  - B. liquid
  - C. vapor



1 Did you know that all living and nonliving things are made of matter? There are three common states of matter that can be found on Earth. Matter can be a solid, a liquid, or a gas. You see water in its three states all the time. You use liquid water when you brush your teeth. Ice is water in its solid state. The air around you is filled with water in a gas form, or water vapor.

2 The state of matter depends on the way particles move and the way they are arranged. Particles include molecules and atoms that make up all the matter around us. The particles in a solid move very slowly and are close together. The particles in a liquid are farther apart. The particles in a gas are very far apart.

### Reading Check

2. You experience \_\_\_\_\_ states of matter all the time.
- one
  - two
  - three

3 A state of matter can change. Matter changing from one state to another is called a phase change. When solid ice melts, it becomes liquid water. This is a phase change. There are six different phase changes: melting, freezing, vaporization, condensation, sublimation, and deposition.

4 Ice melts when it absorbs heat energy. Ice becomes a liquid because the particles gain energy and begin to move faster. If you put water in the freezer, the particles slow down. The water becomes ice again. The point at which a solid becomes a liquid is called the melting point. The point at which a liquid freezes is called its freezing point. The melting point and freezing point are determined by how closely held the particles are.

### Reading Check

3. Matter changing from one state to another state is a \_\_\_\_.
- phase change
  - melting point
  - state change

5 Liquid water can change into water vapor. The process of a liquid changing into a gas is called **vaporization**. Evaporation and boiling are two ways that a liquid can become a gas.

6 Evaporation is vaporization that takes place at the surface of a liquid. If you have seen a puddle dry up after it rains, then you have seen the process of evaporation. The heat from the sun makes the particles on the surface of the water move faster than those in the rest of the liquid. Particles that are moving faster break away from the surface. This is called evaporation.

7 When you add enough heat to a liquid, the liquid will boil. The heat causes all the particles of the liquid to move faster and faster and change to a gas. Boiling takes place throughout the liquid, not just at the surface. The temperature at which a liquid boils is called its boiling point.

### Reading Check

4. Vaporization includes \_\_\_\_.
- liquid changing into a solid
  - evaporation and boiling
  - evaporation and condensation

8 A gas can change into a liquid in a process called **condensation**. Have you ever noticed dew on grass? When the water vapor in the air touches the cold grass, the particles slow down and form a drop of liquid. Dew is an example of condensation.

### ✓ Reading Check

5. The process of water vapor changing into a liquid is called \_\_\_\_\_.  
a. condensation  
b. vaporization  
c. melting

9 **Sublimation** is the process in which a solid changes directly into a gas without first becoming a liquid. Dry ice is the solid form of carbon dioxide. At room

temperature, dry ice can change into a vapor that looks like fog. In a process called deposition, a gas can change directly into a solid. Frost on a windshield is an example of deposition.

### ✓ Reading Check

6. Dry ice changing into vapor is an example of \_\_\_\_\_.  
a. deposition  
b. sublimation  
c. vaporization

## Word Study

**Context Clues** You can often tell the meaning of a term by reading the words around it. Look in other sentences for clues about the meaning.

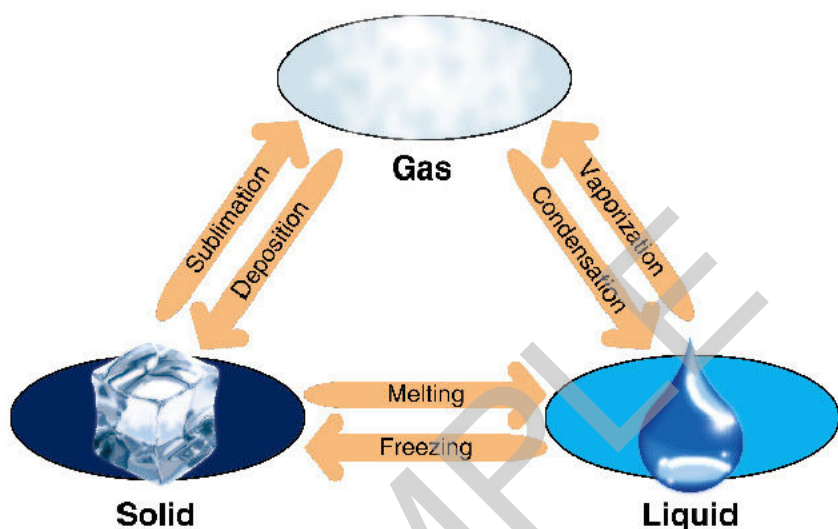
Look at each number in parentheses. Find the paragraph in the reading with the same number. Then find the term that fits the given meaning. Write the term.

7. water in a gas form (1)
8. forms such as solid, liquid, or gas (1)
9. atoms or molecules that make up matter (2)
10. changing from one state to another state (3)
11. temperature at which liquid freezes (4)
12. water changing to a gas at the surface (6)
13. temperature at which a liquid boils (7)
14. water vapor turning into a liquid (8)
15. solid changing into a gas (9)
16. gas changing into a solid (9)

## Standardized Test Practice

### Test Tip

**Order and Sequence** The arrows in the diagram show a sequence of events. Follow the arrows to understand the order of events in the diagram.



**Multiple Choice** Use the diagram to answer the questions.

17. The diagram shows \_\_\_\_.
- A. two states of matter
  - B. six phase changes
  - C. chemical reactions
  - D. that matter cannot change state
18. The process of \_\_\_\_ changes a liquid to a solid.
- A. freezing
  - B. condensation
  - C. melting
  - D. sublimation
19. The diagram shows that a gas can change \_\_\_\_.
- A. into another gas
  - B. only into another liquid
  - C. only into a solid
  - D. into either a liquid or a solid

# 6A *Key Card*

## Phase Changes

### Using Science Words

1. B

### Comprehension

2. c
3. a
4. b
5. a
6. b

### Word Study

7. water vapor
8. state
9. particles
10. phase change
11. freezing point
12. evaporation
13. boiling point
14. condensation
15. sublimation
16. deposition

### Standardized Test Practice

17. B
18. A
19. D

### Writing About Science

Give an example of one of the phase changes you learned about. Explain what happens to the particles during this phase change.