

Phase Changes



Vocabulary

condensation (kon den SAY shuhn)
the 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 usually three states of matter 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 The state of matter can change. When solid ice melts, it becomes liquid water. This is a phase change. Matter changing from one state to another is called a phase change. There are six 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. It 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.

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. Have you seen a puddle dry up after it rains? You have seen the process of evaporation. The heat from the sun makes the particles on the surface of the water move faster than 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 the grass? When the water vapor in the air touches the cold grass, the particles slow down and form a liquid drop. 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 word by reading the words around it. Look for clues or hints about the meaning in the sentences before and after the word.

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 terms.

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

Standardized Test Practice

Test Tip

Order and Sequence The arrows in the diagram show different sequences 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
18. The process of _____ changes a liquid to a solid.
A. freezing
B. condensation
C. melting
19. The diagram shows that a gas can change _____.
A. into another gas
B. only into another liquid
C. into either a liquid or a solid

