

**Thermal Energy and Heat** ▪ *Guided Reading and Study*

## Thermal Energy and States of Matter

*This section explains what causes matter to change state. It also explains why matter expands when it is heated.*

### Use Target Reading Skills

*After you have read the section, use each of the following Key Terms in a sentence. Use all of the information you have learned to write a meaningful sentence for each term. Your sentences should show that you understand the definition of each term.*

state

---

---

change of state

---

---

melting

---

---

freezing

---

---

evaporation

---

---

boiling

---

---

condensation

---

---

thermal expansion

---

---

**Thermal Energy and Heat** ▪ *Guided Reading and Study*

**Three States of Matter**

1. Is the following sentence true or false? Most matter on Earth can exist in three states. \_\_\_\_\_
2. Circle the letter of the terms that identify states of matter.
  - a. water
  - b. gas
  - c. liquid
  - d. solid
3. The particles that make up a(n) \_\_\_\_\_ are packed together in a relatively fixed position.
4. Circle the letter of each statement that is true about liquids.
  - a. Liquids have a definite volume.
  - b. Liquids have a fixed shape.
  - c. Liquid particles can move around.
  - d. Liquid particles are moving around so fast that they don't even stay close together.
5. In which state of matter can the particles only vibrate back and forth?  
\_\_\_\_\_
6. In which state of matter do the particles expand to fill all the space available?  
\_\_\_\_\_

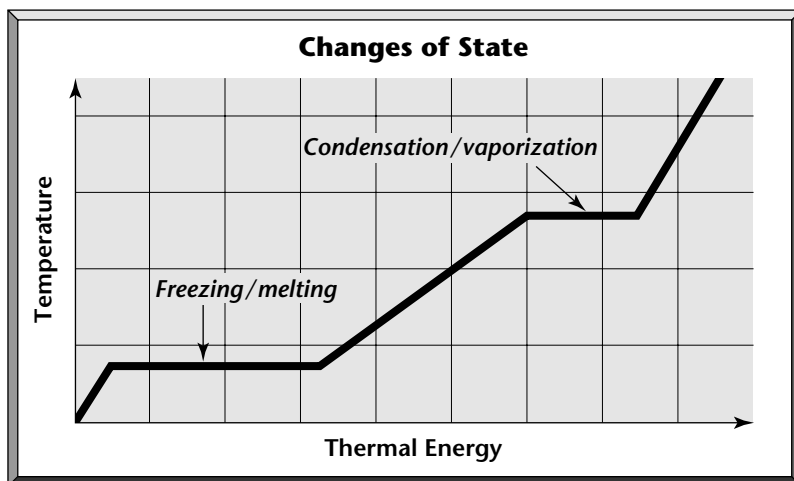
**Changes of State**

7. What is a change of state?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. Matter can change from one state to another when \_\_\_\_\_ is absorbed or released.

**Thermal Energy and Heat** ▪ *Guided Reading and Study*

**Thermal Energy and States of Matter** *(continued)*

9. On the graph below, write labels for the regions of the graph that represent the gas, liquid, and solid states of matter.



10. The change in state from a solid to a liquid is called \_\_\_\_\_.
11. The temperature at which a solid changes to a liquid is called the \_\_\_\_\_.
12. The change in state from a liquid to a solid is called \_\_\_\_\_.
13. The temperature at which a substance changes from a liquid to a solid is called its \_\_\_\_\_.
14. What is vaporization?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
15. If vaporization takes place only at the surface of a liquid, it is called \_\_\_\_\_.
16. What is vaporization called when it occurs below the surface of a liquid?  
 \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

**Thermal Energy and Heat** ▪ *Guided Reading and Study*

17. The temperature at which liquid boils is called its  
\_\_\_\_\_

18. A change from the gas state to the liquid state is called  
\_\_\_\_\_.

**Thermal Expansion**

19. The expanding of matter when it is heated is known as  
\_\_\_\_\_.

20. In thermostats, bimetallic strips are used because different metals  
\_\_\_\_\_ at different rates.