

Earth: The Water Planet ▪ *Guided Reading and Study*

The Properties of Water

This section describes the structure and properties of water. It also describes the way water changes state, or form.

Use Target Reading Skills

After reading the passages that contain key terms, use all the information you have learned to write a definition of each key term in your own words.

polar molecule:

capillary action:

surface tension:

solution:

solvent:

specific heat:

evaporation:

condensation:

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The Properties of Water *(continued)*

The Structure of Water

1. Circle the letter of each sentence that is true about water's structure.
 - a. Water is made up of atoms bonded to form molecules.
 - b. Water contains half as many hydrogen atoms as oxygen atoms.
 - c. Water molecules tend to push away from each other.
 - d. The chemical formula for water is H₂O.

Key Properties of Water

2. A molecule that has electrically charged areas is called a(n) _____ molecule.
3. Circle the letter of each sentence that is true about capillary action.
 - a. It explains how water moves against the force of gravity.
 - b. It is due to the attraction among molecules of water and surrounding materials.
 - c. It prevents water from moving through materials with pores.
 - d. It causes clothing to stay dry.

4. How does capillary action allow water to climb up the sides of a straw?

5. Circle the letter of each sentence that is true about water's surface tension.
 - a. It helps some insects "skate" across the surface of the water.
 - b. It refers to the tightness across the surface of the water.
 - c. It is caused by polar molecules repelling each other.
 - d. It causes raindrops to form round beads.

6. How does surface tension force the surface of water to curve?

7. A mixture that forms when one substance dissolves another is called a(n) _____. The substance that does the dissolving is called a(n) _____.

8. Why can water dissolve many substances?

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9. Circle the letter of each substance that dissolves in water.
 - a. salt
 - b. oil
 - c. oxygen
 - d. wax
10. The amount of heat needed to increase the temperature of a certain mass of a substance by 1°C is its _____.
11. Is the following sentence true or false? Compared with other substances, water requires a lot of heat to increase its temperature.

12. Circle the letter of each sentence that is true about water’s specific heat.
 - a. It is due to the many attractions among water molecules.
 - b. It makes large bodies of water heat up more quickly than nearby land.
 - c. It makes large bodies of water cool off more slowly than nearby land.
 - d. It leads to warmer air over land than over water on summer days.

Changing State

13. List the three states of matter.
 - a. _____
 - b. _____
 - c. _____
14. Solid water is called _____.
15. Complete this compare/contrast table.

How Water Changes State

Type of Change	Starting State	Ending State
Melting	Solid	Liquid
Boiling	a.	b.
Evaporation	c.	d.
Condensation	e.	f.
Freezing	g.	h.

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Match the state of water with the statement that is true about it.

State of Water	Statement
___ 16. ice	a. It is invisible.
___ 17. liquid water	b. It takes the shape of its container.
___ 18. water vapor	c. It has a temperature less than 0°C.

19. Circle the letter of each sentence that is true about evaporation.

- a. It occurs as water molecules absorb energy.
- b. It occurs as water molecules slow down.
- c. It occurs at the surface of a liquid.
- d. An example of it is air drying your hair after swimming.

20. Circle the letter of each sentence that is true about condensation.

- a. It occurs as water molecules slow down.
- b. It occurs as the temperature of water molecules reaches the boiling point.
- c. It turns water from a visible state to an invisible state.
- d. An example of it is clouding up a cold window with your breath.