

## Chapter 18 Moisture, Clouds, and Precipitation

**Section 18.1 Water in the Atmosphere**

*This section describes how water changes from one state to another. It also explains humidity and relative humidity.*

**Reading Strategy**

In the table below, list what you know about water in the atmosphere and what you would like to learn. After you read, list what you have learned. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

What I Know	What I Would Like to Learn	What I Have Learned
a. <b>Sample answers: Water is important for cloud formation and precipitation.</b>	b. <b>how clouds form</b>	c. <b>Clouds form when air rises, expands, and cools to the dew point.</b>
d. <b>Water is important for precipitation.</b>	e. <b>how precipitation forms</b>	f. <b>Precipitation forms by Bergeron or collision-coalescence processes.</b>

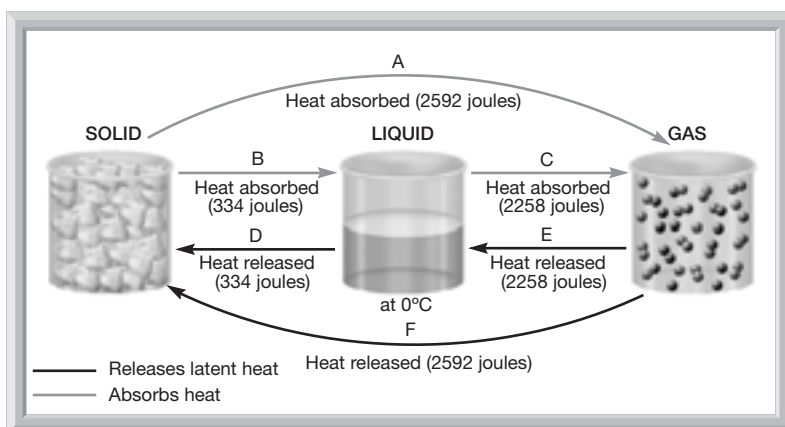
1. Circle the letter of the most important gas in atmospheric processes.

- a. oxygen                      b. nitrogen  
☒ c. water vapor              d. carbon dioxide

**Water's Changes of State**

2. Select the appropriate letter in the figure that identifies each of the following changes of state.



- A**   sublimation                **D**   freezing  
  **F**   deposition                  **C**   evaporation  
  **E**   condensation              **B**   melting





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3. For each change of state, write the opposite change of state.
- a. condensation: evaporation
  - b. freezing: melting
  - c. deposition: sublimation
4. The heat absorbed or released during a change of state is called latent heat.

**Humidity**

5.  Is the following sentence true or false? Saturated warm air contains more water vapor than saturated cold air.  
true
6.  What is the difference between humidity and relative humidity?  
Humidity is the amount of water vapor in air. Relative humidity is the ratio of the amount of water vapor in air to the maximum amount that could be in air at that temperature and pressure.

Match each situation to its change in relative humidity.

Situation	Change in Relative Humidity
<u>a</u> 7. Water vapor is added.	a. increases
<u>a</u> 8.  Air temperature decreases.	b. no change
<u>c</u> 9. Water vapor is removed.	c. decreases
<u>c</u> 10.  Air temperature increases.	

11. When a parcel of air is cooled to the temperature at which it is saturated, it has reached its dew point.
12. Circle the letter of the factor that a hygrometer is used to measure.
- a. humidity
  - (b.)** relative humidity
  - c. temperature
  - d. latent heat
13. A sling psychrometer works because the amount of cooling that occurs in the wet bulb is directly proportional to the dryness of the air.
14. What happens when air that has reached its dew point is cooled further? The air's excess water vapor condenses as dew, fog, or clouds.