refrigerators when the temperature in the freezer compartment is periodically raised to cause any ice that has formed to sublime. A blower then removes the water vapor that has formed. The formation of frost on a cold surface is a familiar example of deposition.

Phase Diagrams

A **phase diagram** *is a graph of pressure versus temperature that shows the conditions under which the phases of a substance exist.* A phase diagram also reveals how the states of a system change with changing temperature or pressure.

Figure 16 shows the phase diagram for water over a range of temperatures and pressures. Note the three curves, AB, AC, and AD. Curve AB indicates the temperature and pressure conditions at which ice and water vapor can coexist at equilibrium. Curve AC indicates the temperature and pressure conditions at which liquid water and water vapor coexist at equilibrium. Similarly, curve AD indicates the temperature and pressure conditions at which ice and liquid water coexist at equilibrium. Because ice is less dense than liquid water, an increase in pressure lowers the melting point. (Most substances have a positive slope for this curve.) Point A is the triple point of water. *The* **triple point** *of a substance indicates the temperature and pressure conditions at which the solid, liquid, and vapor of the substance can coexist at equilibrium.* Point C is the critical point of water. *The* **critical point** *of a substance indicates the critical temperature and critical pressure. The* **critical temperature** *(t_c) is the temperature above which the substance cannot exist in the liquid state.* The critical temperature of water is 373.99°C. Above this

extension

CROSS-DISCIPLINARY

Go to **go.hrw.com** for a full-length article on how cloud seeding is used to produce precipitation.

Keyword: HC6STMX

Phase Diagram for H_2O

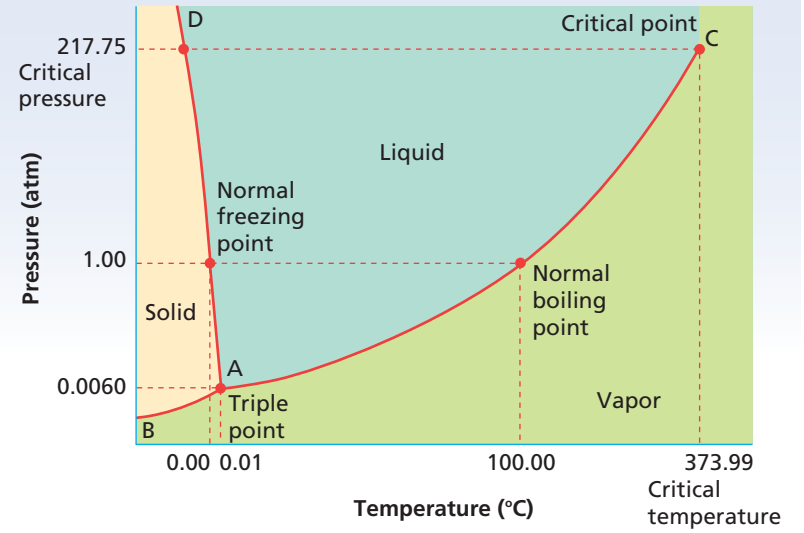

FIGURE 16 This phase diagram shows the relationships between the physical states of water and its pressure and temperature.