

1.2 Thermometers and Temperature Scales

43. While traveling outside the United States, you feel sick. A companion gets you a thermometer, which says your temperature is 39. What scale is that on? What is your Fahrenheit temperature? Should you seek medical help?

1.3 Thermal Expansion

- 49.** The height of the Washington Monument is measured to be 170.00 m on a day when the temperature is $35.0\text{ }^{\circ}\text{C}$. What will its height be on a day when the temperature falls to $-10.0\text{ }^{\circ}\text{C}$? Although the monument is made of limestone, assume that its coefficient of thermal

expansion is the same as that of marble. Give
your answer to five significant figures.

1.4 Heat Transfer, Specific Heat, and Calorimetry

- 61.** On a hot day, the temperature of an 80,000-L swimming pool increases by $1.50\text{ }^{\circ}\text{C}$. What is the net heat transfer during this heating? Ignore any complications, such as loss of water by evaporation.

1.5 Phase Changes

- 72.** How much heat transfer (in kilocalories) is required to thaw a 0.450-kg package of frozen vegetables originally at 0°C if their heat of fusion is the same as that of water?
- 73.** A bag containing 0°C ice is much more effective in absorbing energy than one containing the same amount of 0°C water. (a) How much heat transfer is necessary to raise the temperature of 0.800 kg of water from 0°C to 30.0°C ? (b) How much heat transfer is required to first melt 0.800 kg of 0°C ice and then raise its temperature? (c) Explain how your answer supports the contention that the ice is more effective.

1.6 Mechanisms of Heat Transfer

- 89.** (a) Calculate the rate of heat conduction through house walls that are 13.0 cm thick and have an average thermal conductivity twice that of glass wool. Assume there are no windows or doors. The walls' surface area is 120 m^2 and their inside surface is at 18.0°C , while their outside surface is at 5.00°C . (b) How many 1-kW room heaters would be needed to balance the heat transfer due to conduction?