Integrated Physics Name: _____

Section 16.1 Thermal Energy and Matter (pages 474–478)

This section defines heat and describes how work, temperature, and thermal energy are related to heat. Thermal expansion and contraction of materials is discussed, and uses of a calorimeter are explained.

Reading Strategy (page 474)

Thermal Energy and Matter	
Which has more thermal energy, a cup of tea or a pitcher of juice?	
Why did Rumford conclude that heat is not a form of matter? (Fig. 1)	
How is specific heat related to temperature? (Fig. 3)	

Work and Heat (page 474)

1. Heat is the transfer of thermal energy from one object to another as the result of a difference in

   _____.

2. Circle the letter of each sentence that is true about heat.
   a. Heat is a fluid that flows between particles of matter.
   b. Heat flows spontaneously from hot objects to cold objects.
   c. Friction produces heat.
   d. The transfer of thermal energy from one object to another is heat.

Temperature (page 475)

3. What is temperature?

4. True or false? On the Celsius scale, the reference points for temperature are the freezing and boiling points of water.

5. Circle the letter of each sentence that explains what happens when an object heats up.
   a. Its particles move faster, on average.
   b. The average kinetic energy of its particles decreases.
   c. Its mass increases.
   d. Its temperature increases.

Thermal Energy (page 475)

6. What is thermal energy?

7. Thermal energy depends upon the _____, _____ _____, and

   _____ of an object.

8. true or false? Two substances can be the same temperature and have different thermal energies.