DATE: NAME: CLASS:

CHAPTER 9	Specific Heat Capacity Problems	BLM 9.1.5
ASSESSMENT		

1. How much energy is needed to heat enough water to make a cup of tea (250 mL), if the water is initially at 20.0 ºC and you want to increase the temperature to 85.0 ºC? (Assume that 1.00 mL of water has a mass of 1.00 g.)

2. As the tea in Question 1 steeps, it cools from 85.0 ºC to 75.0 ºC. How much energy is lost by the tea as it steeps?

3. If 100.0 kJ of energy is used to heat 500.0 g of water, what is the temperature change of the water?

Specific Heat Capacity Problems (continued)

4. A 1.00 kg block of ice, at –25.0 ºC, is warmed by 35 kJ of energy. What is the final temperature of the ice?

5. Which substance—100 g of moist air, 100 g of water, or 100 g of ice—will experience the greatest temperature change if 100 J of energy is used to warm it? Why?

6. Imagine that you have a 500 g iron pot ($c = 0.440 \frac{\text{J}}{\text{g}\bullet^\circ\text{C}}$), a 500 g copper pot ($c = 0.385 \frac{\text{J}}{\text{g}\bullet^\circ\text{C}}$), and a 500 g aluminium pot ($c = 0.897 \frac{\text{J}}{\text{g}\bullet^\circ\text{C}}$). You fill each pot with 250 mL of water and heat the water to 100 ºC on a stove. Which pot will keep the water warm the longest? Explain your answer.

Specific Heat Capacity Problems (continued)

7. A 5.0 g sample of an unidentified metal absorbs 71 J of energy as its temperature increases from 125 ºC to 162 ºC. What metal is the sample? (Hint: See the data in Question 6.)

8. What mass of seawater is needed to provide 300.0 MJ as it cools from 75 ºC to 33 ºC?

9. How much water can be heated from its melting to its boiling point by adding 2.75×10^6 J of energy?

Specific Heat Capacity Problems (continued)

10. If 100.0 g of a substance releases 45 kJ of energy as it cools from 13.0 ºC to –15.0 ºC, what is the specific heat capacity of the substance?