Integrated Science Name: _____
Unit 4: Matter, Energy, & the Hydrosphere Date: _____ Period: _____

Specific Heat and Heat Capacity Practice Problems

Be sure to show all work and the answer with the appropriate unit. If a conversion is needed, use factor label.

$$Q = c_p m \Delta T$$

1. The temperature of 335 g of water changed from 24.5°C to 26.4°C. How much heat did this sample absorb? (c for water = 4.18 J/g°C)

2. How much heat in kilojoules has to be removed from 225g of water to lower its temperature from 25.0°C to 10.0°C? (1000 J= 1kJ)

3. How much heat is required to bring 1.0kg of water from 25°C to 99°C? (1000g=1kg)

4. A calorimeter has a specific heat capacity of 1265 J/g°C. A reaction causes the temperature of the 50.0g calorimeter to change from 22.34°C to 25.12°C. How many kilojoules of heat were released in this process?

5. What is the specific heat of silicon (in J/g°C) if it takes 192J to raise the temperature of 45.0g of Si by 6.0°C?

6. Assuming that Coca Cola has the same specific heat as water (4.18 J/g^{o}C), calculate the amount of heat in kJ transferred when one can (about 350g) is cooled from 25^{o}C to 3^{o}C .

7. What is the specific heat (in J/g°C) of lead if it takes 96J to raise the temperature of a 75g block by 10^{o}C?

8. Titanium metal is used as a structural material in many high-tech applications such as jet engines. What is the specific heat of titanium (in J/g°C) if it takes 89.7 J to raise the temperature of a 33.0g block by 5.20°C?

9. Mercury (Hg) is the only metal that exists as a liquid at room temperature. Hg as a specific heat capacity of 0.140J/g°C. How many kilojoules of energy are required to increase 75.0kg of Hg from 23.0 to 52.0ºC?

10. An insulated cup contains 75.0g of water at 24.00^{o}C. A 26.00g sample of metal at 82.25^{o}C is added. The final temperature of the water and metal is 28.34^{o}C. What is the specific heat of the metal?
hint; this is similar to what you did in LAB this week