CW1 – Heat Problems  **q = mC∆T**

Name Period: 2 3 4

1. Practice these conversions:
   1. Convert 50.0 calories (cal) to kilocalories (Cal)
   2. A fun size Milky Way has 81 kilocalories (Cal). How many calories does it have?
   3. A 24oz. bottle of Coca Cola has 291 Cal. How many joules (J) is that?
2. How much heat energy is required to heat 100.0g of Al from 25°C to 100°C? The heat capacity of aluminum is 0.89J/g°C.
3. How much heat is released when 65.0g of steam is cooled from 150°C to 125°C? The heat capacity of steam is 2.0J/g°C.
4. What mass of gold takes -78J of energy to change temperature from 80°C to 40°C? Is this process endothermic or exothermic? The heat capacity of gold is 0.13J/g°C.

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1. Explain, on a molecular level, why the temperatures of a cold soft drink and a hot coffee in the same room will eventually be the same.
2. In an endothermic reaction, which has more energy, the reactants or the products? What about in an exothermic reaction, which has more energy- the reactants or the products?
3. If 7.24kJ (Remember 1000J = 1kJ.) of heat is added to a 952g block of metal, the temperature increases by 10.7°C. Calculate the specific heat capacity of the metal.
4. Three 75.0g samples of copper, silver, and gold are available. Each of these samples is initially at 24°C, and then 2.00kJ of heat is applied to each sample. Which sample will end up with the highest temperature? The heat capacities of copper = 0.385J/g°C, silver = 0.24J/g°C, and gold = 0.13J/g°C.
5. Determine the change in temperature when 55.0g of carbon is heated using 240 calories. If the original temperature of the carbon was 20°C, what is the final temperature? The heat capacity of carbon is 0.71J/g°C.