

## QUESTIONS TO HAND IN – EXPERIMENT 16

NAME \_\_\_\_\_

LAB INSTRUCTOR \_\_\_\_\_ LAB DAY/TIME \_\_\_\_\_

1. The specific heat of a particular substance is a measure of how much heat energy it takes to raise a unit mass of it by  $1\text{ C}^\circ$ . The specific heat for water is  $4,186\text{ joules/kg-C}^\circ$ . How much heat does it take to raise  $1\text{ kg}$  of water by  $10\text{ C}^\circ$ ?
2. Sand on the beach has a specific heat that is about 10 times smaller than that of water. If  $1\text{ joule}$  of heat energy is absorbed by equal masses of sand and water, which one will change temperature more and why?
3. A quantity of cream at  $10\text{ }^\circ\text{C}$  is poured into a cup of steaming hot coffee at  $90\text{ }^\circ\text{C}$ . Which body loses heat and which body gains heat?
4. In the situation of Question 3 above, assume that the mass of cream is  $0.01\text{ kg}$  and the mass of coffee is  $0.20\text{ kg}$ . Since both substances are mainly water, assume that the specific heats for both are the same as water, namely:  $4,186\text{ joules/kg-C}^\circ$ . What is the final temperature of the mix, assuming no heat is gained from or lost to the surroundings?
5. How much heat is gained and lost in the exchange between the cream and coffee?