Planet Holloway **websheet 11.1**
AP Physics 2 - Chapter 11 Thermal Processes
You may print this out and write on it or work on your own paper.
Show all work.

1. What is the temperature increase of 14.0 kg of water when heated by an 800-W immersion heater for 20 min? (c_w = 4 186 J/kg▪°C)

2. Find the final equilibrium temperature when 10.0 g of milk at 10.0°C is added to 180 g of coffee at 80.0°C. (Assume the specific heats of coffee and milk are the same as water and neglect the heat capacity of the container.) c_{water} = 1.00 cal/g·ºC = 4186 J/kg·ºC

3. A puddle holds 350 g of water. If 2.50 g of water evaporates from the surface, what is the approximate temperature change of the remaining water? (L_v = 540 cal/g)

4. How much heat energy is required to vaporize a 12.0-g ice cube at 0°C? The heat of fusion of ice is 80 cal/g. The heat of vaporization of water is 540 cal/g, and c_{water} = 1.00 cal/g▪°C.

5. A wire connects a heat reservoir to a heat sink. By what factor does the heat flow change if the length of the wire in doubled and the temperature difference between the reservoir and sink are doubled?

6. A windowpane is 4 mm thick and has an area of 0.8 m^2. The temperature difference between the inside and outside surfaces of the pane is 25 C°. What is the rate of heat flow through this window? (Thermal conductivity for glass is 0.84 J/s▪m▪°C.)

Answers:

1. 16.38 °C

2. 76.32 °C

3. – 3.88 ºC

4. 8640 cal

5. None (1)

6. 4 200 J/s