Name _____

Date _____ Pd ____

Unit 3 Worksheet 6 – Mixed Energy Problems

Energy constants (H_2O)

4.18 J/g˚C = 1.00 cal/g˚C	Heat capacity (c) of liquid water
2.1 J/g˚C = 0.50 cal/g˚C	Heat capacity (c) of solid water
334 J/g	Heat of fusion (melting or freezing) H_f
2260 J/g	Heat of vaporization (evaporating or condensing) H_v

For each of the problems:

a) Sketch a **warming or cooling curve** to help you decide which heat capacity constant to use to solve the problem. Identify the system by drawing an **energy flow diagram**.

b) Solve the problem. **Show your set-up with clearly labeled units throughout**! Keep a reasonable number of sig figs in your answers.

1. A sample of ice (mass = 32.0 g) has just melted in a glass of warm soda. If 3344 J of energy are absorbed by the water (now at 0.0°C), what is the final temperature of the water?

2. Suppose in the Icy Hot lab that the burner transfers 115 kJ of energy to solid water at 0.0˚C. What mass of water could be melted?

3. A warm cup of coffee (85.0 ^{o}C) is spilled on the kitchen table. If the mass of the coffee is 320. g, how much energy will be given off to the surroundings if the spilled coffee cools to 24.0 ^{o}C?

4. How much energy must be added to completely boil 150. g of water at 100.0 ˚C?

5. If 130. kJ of energy are removed from a 4.00 x 10^{2} g sample of water at 0.0˚C, will the sample of water completely freeze? Explain **and** show all work.

6. While your cool glass of ice tea sits on the table, 15 g of water vapor condenses on the side of the glass. How much energy is involved in this process?