Name Period Date

Unit 3 Worksheet 4 Quantitative Energy Problems Part 2

Energy constants (H₂O)

334 J/g Heat of fusion (melting or freezing) H_f

2260 J/g Heat of vaporization (evaporating or condensing) H_V

2.1 J/g°C Heat capacity (c) of solid water 4.18 J/g°C Heat capacity (c) of liquid water

For each of the problems sketch a warming or cooling curve to help you decide which equation(s) to use to solve the problem. Keep a reasonable number of sig figs in your answers.

1.	How much energy must be absorbed by a 150 g sample of ice at 0.0 °C that melts
	and then warms to 25.0°C?

2. Suppose in the Icy Hot lab that the burner transfers 325 kJ of energy to 450 g of liquid water at 20.°C. What mass of the water would be boiled away?

3. A 12oz can of soft drink (assume m = 340 g) at 25°C is placed in a freezer where the temperature is -12 °C. How much energy must be removed from the soft drink for it to reach this temperature?

4. 65.0 kilojoules of energy are added to 150 g of ice at 0.0°C. What is the final temperature of the water?

5. 250 kJ of energy are removed from a 4.00 x 10² g sample of water at 60°C. Will the sample of water completely freeze? Explain.

6. An ice cube tray full of ice (235g) at -7.0°C is allowed to warm up to room temperature (22°C). How much energy must be absorbed by the contents of the tray in order for this to happen?

7. If this same quantity of energy were removed from $40.0~\rm g$ of water vapor at $100^{\circ}\rm C$, what would be the final temperature of the water?