Name: _____

LAB 13 PRE-LAB

This week's lab entails two activities. In the first, you heat a metal sample to a known initial temperature, place it into cool water, and allow the metal and water to come to thermal equilibrium. In the second, you immerse a vessel of water in a below-freezing slush bath and record how the water's temperature changes with time as it freezes.

1. The equation below expresses the conservation of thermal energy between a mass M_m of metal initially at a temperature of T_m as it comes to thermal equilibrium with a mass M_w of water initially at temperature T_w. In plain English, it says that heat entering the metal equals the negative of the heat entering the water. This assumes that energy does not go anywhere else or enter from anywhere else. Solve this equation for c_m, the specific heat capacity of the metal. Show your steps.

$$M_m \cdot \Delta T_m \cdot c_m = - M_w \cdot \Delta T_w \cdot c_w$$

2. Sketch what you expect a graph of temperature (vertical axis) vs. time (horizontal axis) to look like as the water in the second activity ("Latent Heat") freezes.