

1. How much heat is required to raise the temperature of 10.0 kg of water from 20.0°C to 100.0°C? **(3.34 x10³ kJ)**
2. It took 1550 J of energy to heat a piece of aluminum from 21.0°C to 266.0°C. What was the mass of the aluminum? (Begin by rearranging to solve for m.) **(7.0 g)**
3. The sun shone on a 125 kg block of ice (at a very cold temperature, far below its freezing point) for half an hour. If the ice absorbed 5.03 x 10³ kJ of energy, how much did the temperature increase? (Begin by rearranging formula to solve for Δt.) **(19°C)**
4. If a piece of copper with a mass of 2.39 g and a temperature of 100.0°C is dropped in 10.0 cm³ of water at 14.1°C, what will be the final temperature of the system? **(16.0°C)**
5. Joe was welding a piece of iron with a mass of 5650 g, and caused it to reach a temperature of 312°C. To cool the iron, he placed it in a pail containing 2.00 L of water at 22.5°C. To what temperature did the iron cool? Would he have been able to handle it with his bare hands? **(89.3°C)**
6. To cool 250.0 g of aluminum from 225°C to 25.0°C, how much water at 20.0°C would be required (in liters)? **(2.2 L H₂O)**
7. A candle (paraffin wax = C₂₅H₅₂(s)) was used to heat 285.4 g of water from 12.0°C to 29.2°C. Before the candle was lit, it had a mass of 28.5 g, and after the heating was done, its mass was 2.6 g.
 - a) How much mass of the candle was used in the reaction?
 - b) Using your answer from a), find the molar enthalpy of combustion for paraffin wax. **(279 kJ/mol)**
8. Combustion of 2.55 g of ethanol, C₂H₅OH(l), in a calorimeter with a heat capacity of 1.38 kJ/g °C causes a temperature increase of an unspecified liquid to rise from 20.19 °C to 31.18 °C. If the volume of the liquid is 10.0 mL, find the molar enthalpy of combustion for ethanol from this evidence. **(2740 kJ/mol)**