1. How many joules are needed to warm 25.5 grams of water from 14.0 °C to 22.5 °C?
2. Calculate the number of joules released when 75.0 grams of water are cooled from 100.0 °C to 27.5 °C.
3. Calculate the heat, in joules, needed to warm 225 grams of water from 88.0 °C to its boiling point, 100.0 °C.
4. The specific heat of gold is 0.128 J/g °C. How much heat would be needed to warm 250.0 grams of gold from 25.0 °C to 100.0 °C?
5. The specific heat of zinc is 0.386 J/g °C. How many joules would be released when 454 grams of zinc at 96.0 °C were cooled to 28.0 °C?
6. Phileas Fogg, the character who went around the world in 80 days, was very fussy about his bathwater temperature. It had to be exactly 38.0 °C. You are his butler, and one morning while checking his bath temperature, you notice that it’s 42.0 °C. You plan to cool the 100.0 kg of water to the desired temperature by adding an aluminum-duckie originally at freezer temperature (-24.0 °C). Of what mass should the Al-duckie be? [Specific heat of Al = 0.900 J/(g °C); density of water = 1 .00 g/ml]. Assume that no heat is lost to the air.
7. A certain material’s temperature increases by 1.0 °C for every 1560 J that it gains. A 0.1964 g sample of quinone (molar mass = 108.1 g/mole) was burnt, and the surrounding material’s temperature increased from 20.3 °C to 23.5 °C. Find the molar heat of combustion for quinone.
8. A 1.55 g of CH4O sample is burnt in a calorimeter. If the molar heat of combustion of CH4O is -725 kJ/mole, and assuming that the 2.0 L of water absorbed all of the heat of combustion, what temperature change did the water experience?

9. In real calorimeters, most of the heat released by the bomb is absorbed by water, but a certain amount is also absorbed by the metal and insulation surrounding the water tank. A certain calorimeter absorbs 24 J/ °C. If 50.0 g of 52.7 °C water is mixed with the calorimeter’s original 50.0 g of 22.3 °C water, what will be the final temperature of the mixture?