1. The specific heat of aluminum is 900 $J/kg\,^{\circ}C$. The specific heat of iron is 448 $J/kg\,^{\circ}C$. You are given 0.5 kg blocks of aluminum and iron. They are both supplied with 5000 J of heat. Determine the final temperature of each of the blocks.

2. Determine the amount of heat required to raise the temperature of an aluminum cube of side 0.15 kg from 30 $^{\circ}C$ to 300 $^{\circ}C$. The density of aluminum is 2700 kg/m^3 and its specific heat is 900 $J/kg\,^{\circ}C$. Determine the volume and density of this block at 300 $^{\circ}C$.

3. A 0.5 kg block of aluminum at 70 $^{\circ}C$ is dropped in a calorimeter containing 0.8 kg of water at 5. $^{\circ}C$. Determine the equilibrium temperature of the mixture. How much energy does the aluminum lose in the process?

4. A unknown material of mass 0.25 kg at 80 $\circ C$ is dropped in a calorimeter containing 0.4 kg of water at 10 $^{\circ}C$. The equilibrium temperature of the mixture is measured to be 13.54 $^{\circ}C$. What material is the unknown object made of? (c_{al} = 900 $J/kg\,^{\circ}C$, c_{iron} = 448 $J/kg\,^{\circ}C$, c_{copper} = 387 $J/kg\,^{\circ}C$, c_{silver} = 234 $J/kg\,^{\circ}C$).

5. Determine the amount of heat required to melt 5 kg of aluminum at its melting point (660 $^{\circ}C$). The latent heat of fusion of aluminum is 3.97×10^5 J/kg.

6. The specific heat of aluminum in the solid phase is 900 $J/kg\,^{\circ}C$. The melting point of aluminum is 660 $^{\circ}C$ its latent heat of fusion is 3.97×10^5 J/kg. Determine the amount of heat required to convert 0.5 kg of aluminum from 20 $^{\circ}C$ to molten aluminum at 660 $^{\circ}C$.