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A student heats a 200 g sample of water from 20°C to 80°C. The specific heat of water is 4.18 J/g•°C.

- a. Calculate the thermal energy absorbed by the water. Show your calculations and include units in your answer.

The student then boils the water.

- b. Describe what happens to the temperature of the water as it boils. Explain your answer.

The student repeats the experiment, this time placing a small block of iron into another 200 g sample of water. The specific heat of iron is 0.45 J/g•°C. Both the iron and the water are initially at 20°C and are heated to 80°C.

- c. Compare the amount of thermal energy absorbed by the water in this experiment with your calculation in part (a). Explain your answer.
- d. Describe how repeating the second experiment with a block made of a material with a greater specific heat will affect the amount of time it takes to heat the block. Assume the blocks have the same mass.