

1. How much heat energy is absorbed by 1000.0 g of water when its temperature increases from 0.0°C to 100.0°C?
2. How much heat energy is absorbed by 1000.0 g of iron when its temperature is increased from 0.0°C to 100.0°C? The specific heat capacity of iron is 0.46 J/g°C.
3. Fifty grams (50.0) of hot water at a temperature of 65.0°C is mixed with 40.0 grams of cold water. The final temperature of the mixture is 45.0°C.
 - a. How much heat energy did the hot water lose?
 - b. How much heat energy did the cold water gain?
 - c. What was the initial temperature of the cold water?
4. Three hundred calories of heat energy is absorbed by 30.0 grams of aluminum. What will its temperature change be?
5. A piece of metal with a mass of 60.0 grams loses 200.0 calories upon cooling from 50.0°C to 0.0°C. What is the specific heat of the metal?
6. One gram of aluminum absorbs 0.215 calories of heat energy when its temperature increases 1.0°C. One gram of copper absorbs 0.092 calories of heat energy when its temperature increases 1.0°C. Suppose you have equal masses of aluminum and copper. If they absorb the same amount of heat energy, which would you have a greater temperature change? Explain.

7. A gold ring with a mass of 22.25 grams was placed into boiling water for 5 minutes. (The temperature of the boiling water is 100.0°C .) The ring was then dropped into 20.0 g of water which is at a temperature of 25.0°C . The temperature of the water increases to 27.5°C .
- What is the temperature increase of the water?
 - How much heat did the water gain?
 - What was the temperature change of the ring?
 - How much does the amount of heat gained by the water compare with the amount of heat lost by the ring?
 - Calculate the specific heat of the ring.
8. Suppose you heat 100.0 grams of room temperature water (25.0°C) to a temperature of 60.0°C . You also heat 1000.0 grams of water from 25.0°C to 60.0°C .
- Did the water in the 2 beakers have the same temperature change?
 - Do the water molecules in the large beaker have the same average speed as do those in the small beaker?
 - Did the beakers gain the same amount of heat energy?
9. Fifty (50.0) grams of lead is dropped into cool water. The temperature of the lead decreases from 250.0°C to 25.0°C .
- How much heat did the lead lose? The specific heat capacity of iron is $0.128\text{ J/g}^{\circ}\text{C}$.
 - If the mass of the water is 100.0 grams, what was the temperature change of the water?
 - What was the initial temperature of the water?