Name _____ Date _____ Period _____

ZornScience
zornscience.org

Heat Calculations

Chemistry

$q = mc\Delta T$ gives joules. $\Delta T = T_{final} - T_{initial}$, so the sign of q comes out on its own. Change kJ to J first. Use the specific heats in the table.

Substance	c (J/g·°C)
water	4.18
aluminum	0.897
iron	0.449
copper	0.385

1. How much heat does 150. g of water absorb when it warms from 20.0 °C to 65.0 °C?

2. A 25.0 g block of aluminum cools from 95.0 °C to 25.0 °C. Find q. Was heat absorbed or released?

3. A 40.0 g metal sample absorbs 616 J and warms from 20.0 °C to 60.0 °C. Find its specific heat and identify the metal.

4. 200. g of water at 25.0 °C absorbs 12.5 kJ. What is its final temperature?

5. What mass of iron is heated from 25.0 °C to 85.0 °C by 2.69 kJ?

6. 500. g of water cools from 80.0 °C to 30.0 °C. Find q in kJ.

CC BY-NC-SA 4.0 | zornscience.org

7. The same amount of heat is added to 100. g of water and to 100. g of iron. Which one gets hotter? About how many times larger is its temperature change? Explain.

8. A student finds q for 50.0 g of water heated by 15.0 °C and writes q = 50.0 × 4.18 × 15.0 = 3.14 kJ, then plugs 3.14 into the next equation as joules. What is wrong?

9. Why do coastal cities have milder temperatures than inland cities? Use specific heat in your answer.

CC BY-NC-SA 4.0 | zornscience.org