

Phys. Science Chapter 16 Specific Heat Problems

(Do not write on this sheet)

Show the set up in the equation for each problem

Specific Heat is the amount of heat needed to raise the temperature of 1 g of material by 1°C.

$$Q = m \times c \times \Delta T \qquad \Delta T = \frac{Q}{(m \times c)} \qquad m = \frac{Q}{(\Delta T \times c)} \qquad c = \frac{Q}{(m \times \Delta T)}$$

Q = heat absorbed m = mass ΔT = change in temperature c = of material

Q is measured in J (joules) or kJ (kilojoules)

Problems:

Specific Heat table on the back

1. How much heat is needed to raise the temperature of 50.0 g of water by 25.0°C
2. How much heat is absorbed by a 600 g iron cornbread pan when its temperature rises from 22°C to 130°C?
3. How much heat is absorbed by a 45.0 g aluminum cupcake pan when its temperature rises from 20°C to 120°C?
4. How much heat is absorbed by a 420 g copper kettle when its temperature rises from 21°C to 103°C?
5. In a small aquarium, the heater transfers 110,000 J of heat to 5500 g of water. How much did the temperature of the water rise?
6. A 23.2 g gold ring is left on a stove. How much did the rings temperature rise if it absorbed 558.3 J of heat?
7. A 75 g brass ball absorbs 4275 J of heat as it is worked on. What was it rise in temperature?
8. A chunk of ice absorbs 1230 J of heat as it rises in temperature from -10°C to 10°C. What was the mass of the ice?
9. A silver spoon absorbs 4781.2 J of heat as its temperature rises from 20°C to 92°C while it is left in a pot on the stove. What is the spoon's mass?
10. In a lab a test tube ethyl alcohol absorbs 3992.5 J of heat. Its temperature rises from 17.4°C to 51.7°C. What was the mass of the alcohol?
11. A shooter is casting a lead bullet. The lead's mass is 34.5 g and it absorbs 2561 J of energy as rises in temperature from 20°C to 600°C. What is lead's specific heat?
12. A hot cup is set on a granite coaster. The coasters mass is 215 g and it absorbs 2547 J of energy as it rises in temperature form 22°C to 37°C. What is granite's specific heat?
13. A glass test tube is heated in a lab. The test tube's mass is 28.5 g and it absorbs 245.3 J of energy as its temperature rises from 23°C to 315°C. What is the specific heat of the glass?

Specific Heat of Selected Materials

Substance	c in J/gm K
Aluminum	0.900
Air	1.01
Copper	0.386
Brass	0.380
Gold	0.126
Lead	0.128
Silver	0.235
Tungsten	0.134
Zinc	0.387
Plastic	1.84
Alcohol(ethyl)	2.4
Water	4.186
Ice (-10 C)	2.05
Iron	0.449