

Science Worksheet 2-10a Heat Transfer Worksheet

Name _____ Date _____

In problems 1-3, calculate the heat change (calories) using the equations below

$$\Delta \text{ Heat} = \text{Specific Heat} \times \text{mass} \times \Delta \text{ temperature}$$

1. How many calories of heat are required to raise the temperature of 550 g of water from 12.0 °C to 18.0 °C? (remember the specific heat of water is 1.00 cal/g x °C)

2. How much heat is lost when a 640 g piece of copper cools from 375 °C, to 26 °C? (The specific heat of copper is 0.09 cal/g x °C)

3. The specific heat of iron is 0.107 cal/g x °C. How much heat is transferred when a 24.7 kg iron ingot is cooled from 880 °C to 13 °C?

In problems 4-6, find the mass using the equation below.

$$\text{Mass} = \Delta \text{ Heat} \div (\text{Specific Heat} \times \Delta \text{ temperature})$$

4. How many grams of water would require 22,000 of heat to raise its temperature from 34.0 °C to 100.0 °C? (Remember the specific heat of water is 1.00 cal/g x °C)

5. 2088 cal of heat are applied to a piece of aluminum, causing a 56 °C increase in its temperature. The specific heat of aluminum is 0.22 cal/g x °C. What is the mass of the aluminum?

6. Find the mass of a sample of water if its temperature dropped 24.8 °C when it lost 207 cal of heat.

In problems 7-9 find the temperature change, using the equation below.

$$\Delta \text{ temperature} = \Delta \text{ Heat} \div (\text{Specific Heat} \times \text{mass})$$

7. How many degrees would the temperature of a 450 g ingot of iron increase if 1818 cal of energy are applied to it? (The specific heat of iron is $0.107 \text{ cal/g} \times ^\circ\text{C}$)

8. A 250 g sample of water with an initial temperature of $98.8 ^\circ\text{C}$ loses 1794 cal of heat. What is the final temperature of the water? (Remember, final temp = initial temp - change in temp)

9. Copper has a specific heat of $0.09 \text{ cal/g} \times ^\circ\text{C}$. How much change in temperature would the addition of 8373 cal of heat have on a 538.0 gram sample of copper?

In problems 10-12 find the Specific Heat using the equation below.

$$\text{Specific Heat} = \Delta \text{ Heat} \div (\text{mass} \times \Delta \text{ temperature})$$

10. Determine the specific heat of a certain metal if a 450 gram sample of it loses 8253 cal of heat as its temperature drops by $97 ^\circ\text{C}$.

11. 1145 cal of heat are transferred to a 89.0 gram sample of an unknown material, with an initial temperature of $23.0 ^\circ\text{C}$. What is the specific heat of the material if the final temperature is $89.5 ^\circ\text{C}$?

12. The temperature of a 55 gram sample of a certain metal drops by $113 ^\circ\text{C}$ as it loses 837 cal of heat. What is the specific heat of the metal?