

CALCULATING HEAT IN CALORIES B

3. Rosella has a 10-liter fish tank. The water needs to be 28°C for her tropical fish. When she filled the tank, the temperature of the water was 12°C. How many calories of heat must transfer to the aquarium before it is ready for the fish?

$$\Delta T = T_f - T_i = 28^\circ\text{C} - 12^\circ\text{C} = 16^\circ\text{C}$$

$$\text{cal} = m \times \Delta T = 10,000 \text{ g} \times 16^\circ\text{C} = 160,000$$

4. Cindy made tea. She started with 300 g of water at 20°C. She transferred 18,000 cal to the water. What was the final temperature of the water?

$$\text{cal} = m \times \Delta T = 300 \text{ g} \times \Delta T = 18,000 \text{ cal}$$

$$\Delta T = 18,000 \text{ cal} / 300 \text{ g}$$

$$\Delta T = 60^\circ\text{C}$$

$$T_f = T_i + \Delta T = 20^\circ\text{C} + 60^\circ\text{C} = 80^\circ\text{C}$$

5. Lee's 600-mL cup of cocoa got cold. It was only 25°C. He put it in the microwave. How many calories must transfer to the cocoa to bring it up to 70°C?

$$\Delta T = T_f - T_i = 70^\circ\text{C} - 25^\circ\text{C} = 45^\circ\text{C}$$

$$\text{cal} = m \times \Delta T = 600 \text{ g} \times 45^\circ\text{C} = 27,000 \text{ cal}$$