

Question:

A 30.00 ton block of aluminum at room temperature (22.0 °C) is struck by lightning. The lightning transfers  $3.200 \times 10^6$  kJ of energy to the block. How hot does the block get? [1 ton = 2000 lb, 1 lb = 453.6 g]

Solution:

$$Q = cm\Delta t$$

$$\Delta t = \frac{Q}{cm}$$

Assuming that aluminum has  $c = 897 \frac{J}{kg \cdot K}$

$$\Delta t = \frac{3,200,000,000}{897 \cdot 30000} = 119^\circ$$

Hence, final temperature of the block is  $22 + 119 = 141^\circ C$ .

Answer: 141°C