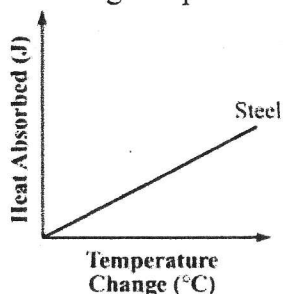


OPEN RESPONSE #3: Heat and Heat Transfer

A car's brakes absorb a large amount of energy and heat up as the car slows down and stops. Several materials with different thermal properties have been used for car brakes. In the table below, the specific heat capacities of three of these materials are shown.

Material	Specific Heat Capacity ($\text{J/g} \cdot ^\circ\text{C}$)
aluminum	0.897
carbon-ceramic	1.123
steel	0.449

In an experiment, 500 g each of aluminum, carbon-ceramic, and steel are heated and their temperature changes are recorded. The amount of heat absorbed and the temperature change for the 500 g sample of steel are shown in the graph below.



- In your Student Answer Booklet, copy the graph.
 - Draw a line on your graph to show the relationship expected for the 500 g sample of aluminum.
 - Draw a line on your graph to show the relationship expected for the 500 g sample of carbon-ceramic.
 - Identify each line on your graph, and explain why you drew each line where you did.
- If brake materials get too hot they soften or melt, resulting in loss of braking power. Of the three materials in the table, which is **best** suited to resist large changes in temperature? Explain your answer.