

## Determination of the specific heat capacity of a material

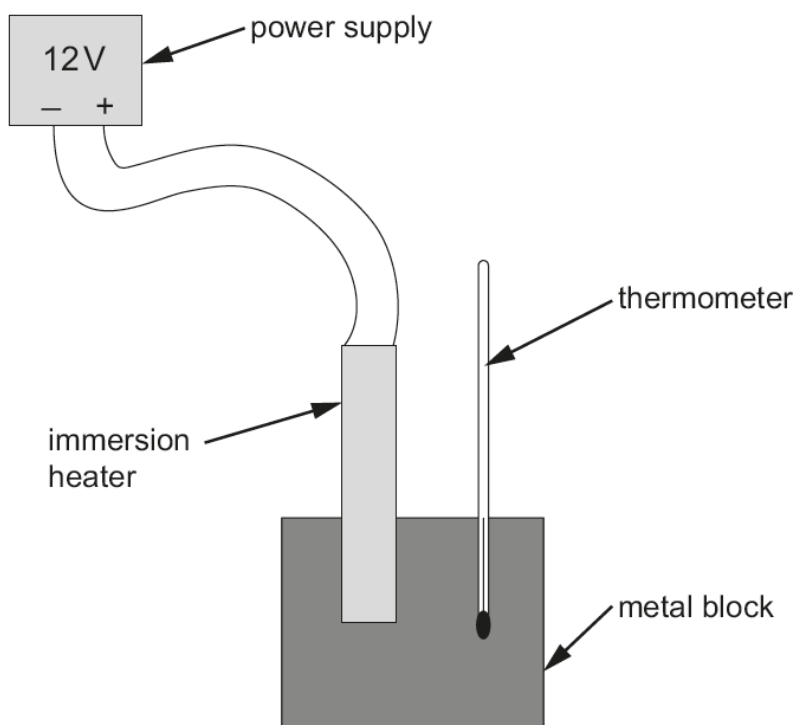
### Introduction

You will determine the specific heat capacity of metals by measuring the heat energy transferred to the metal by an immersion heater and the temperature rise of the metal.

### Apparatus

1 kg metal block  
stopwatch  
12V d.c. power supply  
connecting leads  
50W 12V immersion heater  
thermometer

### Diagram of Apparatus



## Method

1. Ensure the power supply is switched off.
2. Place the immersion heater and thermometer in the holes provided in the metal block.
3. Record the initial temperature of the metal block.
4. Switch on the 12V power supply.
5. Record the temperature of the metal block every minute for 10 minutes.

## Analysis

1. The heat energy transferred to the metal can be calculated from the equation:

$$\text{Energy} = \text{Power} \times \text{Time (seconds)}$$

2. The specific heat capacity ( $c$ ) of the metal can be calculated from:

$$Q = mc\Delta\theta$$

Where:

$Q$  = Heat energy supplied

$m$  = Mass of block

$\Delta\theta$  = Temperature rise of block

Calculate the specific heat capacity of the metal.