

4.1 Simple phenomena of magnetism

01. 0625_s14_qp_63 Q: 4

The IGCSE students are investigating the effect of an electromagnet.

Fig. 4.1 shows part of the equipment they are using.

The current I in the coil of the electromagnet is gradually increased and the reading m on the balance is recorded.

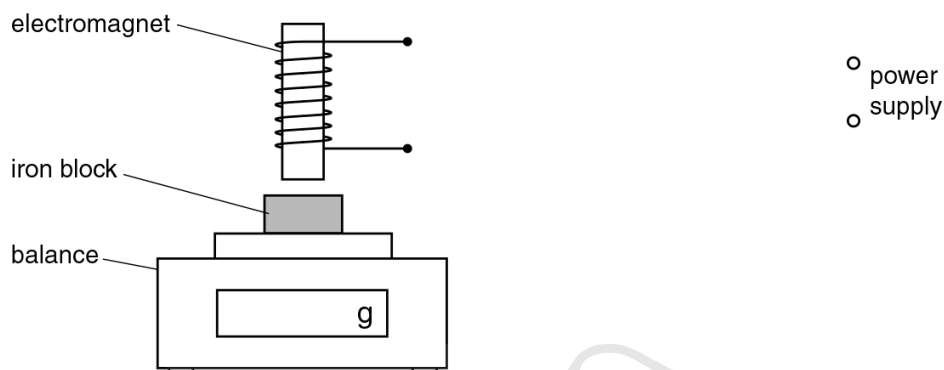


Fig. 4.1

- (a) The students are using a variable resistor (rheostat) to change the current in the series circuit that is connected to the electromagnet.

On Fig. 4.1, use standard symbols to draw a circuit containing a variable resistor and an ammeter connected in a way that would be suitable for the experiment. [2]

- (b) The readings are shown in Table 4.1.

Table 4.1

I/A	m/g	M/g
0.00	61.37	0.00
1.00	57.25	4.12
2.00	53.13	
3.00	49.01	

- (i) At each current, a value M is calculated.

$M = m_0 - m$, where $m_0 = 61.37\text{g}$, the balance reading when $I = 0.00\text{A}$.

Complete the table by calculating and recording M for currents of 2.00 A and 3.00 A. [1]

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(ii) State whether the results suggest that M is proportional to I .

Justify your statement with reference to the results.

statement

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justification

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[2]

[Total: 5]



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(a)	correct symbols for ammeter and variable resistor (rectangle with diagonal strike-through arrow only)	[1]
	correct series circuit	[1]
	accept use of potential divider symbol only if correctly shown in parallel circuit	
(b)	(i) 8.24 and 12.36 correct answer only	[1]
	(ii) expect 'Yes' but allow ecf for incorrect M values	[1]
	appropriate justification referring to <u>figures</u>	[1]
		[Total: 5]



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