

WJEC England Physics GCSE

SP7.1: I-V Characteristics

Practical Flashcards

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Outline the basic steps of the practical.



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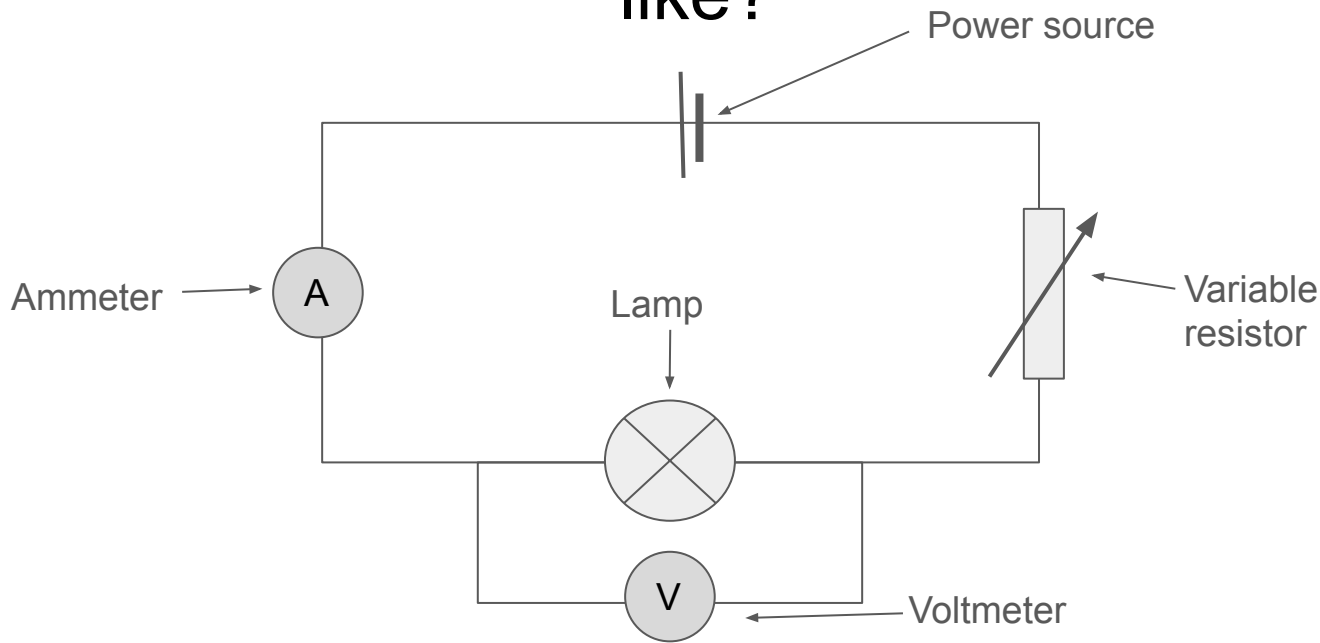
1. Set up a circuit with a voltmeter attached in parallel to a lamp and an ammeter attached in series to the lamp.
2. Start on 0 V and increase the voltage in 1 V intervals, recording potential difference and current values each time.
3. Plot a graph of current against potential difference for the lamp.



What would a circuit diagram for this procedure look like?



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What two types of meters are needed in the circuit, and how should they be connected?



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1. Voltmeter: connected in parallel to the lamp.
2. Ammeter: connected in series with the lamp.



What component is required to alter the potential difference if you are not using a variable power pack?



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A variable resistor.



What is an 'Ohmic Conductor'? State the condition required.



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1. A conductor for which current and p.d. are directly proportional.
2. Resistance is constant (even as current changes).
3. Temperature must be constant.



What must be kept constant to get reliable results? How can you achieve this?



What must be kept constant to get reliable results? How can you achieve this?

Temperature should remain constant so that the resistance of the components is not affected. You should disconnect the supply between readings to avoid unnecessary heating, and to allow cooling.



How do you determine the resistance of a component from an I-V graph?



How do you determine the resistance of a component from an I-V graph?

The resistance at a given point is the inverse of the gradient of the line drawn between that point and the origin.

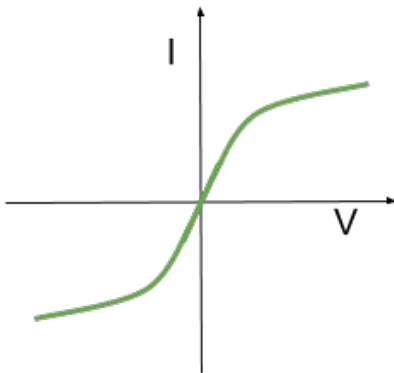
$$\text{Resistance} = 1/\text{Gradient}$$



What would you expect the I-V graph for the filament lamp to look like?



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What happens to the resistance of a filament lamp as the temperature increases? Why?



What happens to the resistance of a filament lamp as the temperature increases? Why?

1. Resistance increases as temperature increases.
2. The ions in the metal have more energy and vibrate more. This causes more collisions with electrons as they flow through the metal, creating greater resistance to current flow.



What safety precautions should be taken when using filament bulbs?



What safety precautions should be taken when using filament bulbs?

1. Avoid touching them when switched on since they can get very hot.
2. Be careful not to use too high a voltage to avoid melting the filament.

