

**2019 Year 11 Physics**

**Task 6: Experiment – Resistance in a wire**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_/ 30

Finding the resistivity of a wire.

When a potential difference is applied across a wire, the movement of electrons does not occur in a straight line, the electrons move in a zig zag as they travel, and they collide with other electrons and atoms in the wire. These collisions resist the flow of electrons inside the wire. This can become important when we look at energy loss when transferring electricity.

The resistance of a wire depends on length (l), cross sectional area (A) and the resistivity (ρ) of the wire. In this experiment we are going to calculate the resistance of a wire for different lengths. This will allow us to calculate the resistivity of the wire.

**Materials supplied:**

* 2 meters of a wire of an unknown value
* Micrometre
* Ruler
* Digital multimeter to measure resistance
* 2 retort stands
* 2 G clamps

**Aim:**

Write an appropriate aim for the investigation.

**Hypothesis:**

Write an appropriate hypothesis for the investigation.

**Method:**

Devise an appropriate method for the investigation to test the hypothesis.

**Safety:**

Complete a safety risk assessment for the experiment (What are the risks, how will they be minimised?)

**Results and Processing of results.**

1. Decide on the best way to present your recorded data. Show the accuracy of the measurements.
2. Perform calculations to determine the resistivity value of the wire.
3. Present the findings in an appropriate manner.
4. Discuss the significance of the results.

**Conclusion:**

Summarise the results determined from the experiment making reference to the values determined, any accepted values, percentage errors and reliability of the results.

Indicate if the hypothesis is supported, with evidence from the investigation.

**Evaluation:**

Describe the factors that affected the accuracy of the experiment, and how they may be reduced.

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| **Section** | **Content** | **Maximum Mark** | **Student Mark** |
| Aim/Purpose and Equipment | Explanation of investigation | 1 |  |
| Hypothesis | Appropriate hypothesis reflecting the dependent and independent variables. | 2 |  |
| Procedure | Appropriately detailed. | 2 |  |
| Safety - risk assessment. | Any safety issues discussed. | 2 |  |
| Results | Appropriate observations and table. Accuracy shown. | 3 |  |
| Analysis of data and post lab discussion. | Appropriate reasoning in calculations. | 3 |  |
| Resistivity of the materials calculated. | 4 |  |
| Appropriate presentation of findings. | 1 |  |
| Discussion of significance of results. | 4 |  |
| Conclusion | Statement summarising investigation findings making reference to values determined.  Accepted values and percentage error.  Reliability.  Hypothesis support with evidence. | 5 |  |
| Evaluation | Comment on accuracy, factors affecting accuracy and how they may be reduced. | 3 |  |
|  | **Total** | **30** |  |