

Physics

PHY3T/Q13/task

Unit 3 Investigative and Practical Skills in AS Physics
ISA (Q) Investigation of LED Behaviour

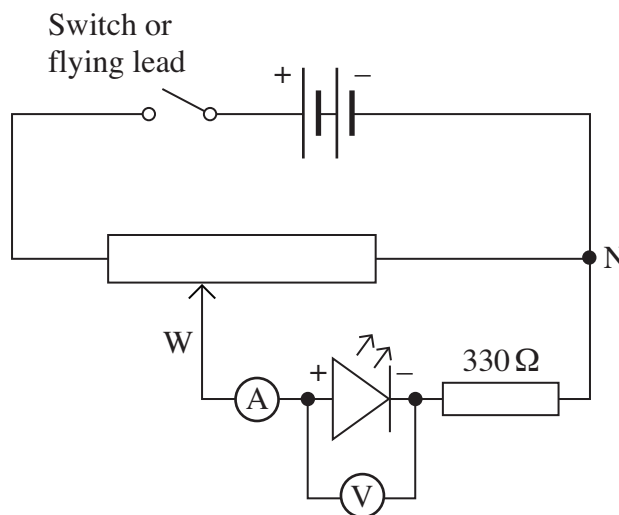
Stage 1: Task Sheet

This task is worth 8 marks

You are advised to read through these instructions before beginning your work.

You are going to investigate the variation of current with potential difference (pd) for a light emitting diode (LED) in the forward and reverse directions. An LED is a device which emits light when it conducts.

Figure 1



- Part of the circuit has been connected for you. Complete the connection of the circuit shown in **Figure 1** with the LED connected in the forward direction.
- Ask your teacher to check it for safety before switching on the circuit.

Switch off (or disconnect the flying lead) when not taking readings to avoid running the battery down.

Turn over ►

- You are going to measure the current through the LED in the forward direction for various values of the pd.
- Make some initial tests to help you decide the values of pd to use, given that the variation of current with pd is **not** linear. Pay particular attention to the range of pds for which the current changes significantly.
- Measure the current in the LED in the forward direction for each pd you have chosen. Take sufficient readings so that repeat readings are not necessary.
- Reverse the battery connections and repeat the experiment.
- Tabulate all your results in a single table, clearly indicating which are forward and which are reverse readings.
- Record the precision of your ammeter and voltmeter.
- Plot a graph of current (on the y-axis) against pd for the **forward** direction only, and draw the line of best fit through your points. **Start the scale on the x-axis at one volt.**

After the Investigation

At the end of the investigation, hand in all your written work, including the graph of current against pd, to the supervisor.

This documentation will be required for Stage 2 of the ISA.

Ensure that you have entered your centre details, candidate number and name on all the sheets you have completed.