**Investigating Electrical Characteristics**

Name:

Date:

**STUDENT**

**Introduction**

In this experiment you will be determining the current – voltage characteristic of an electrical component.

**Aim**

* To plan an experimental procedure with a clear investigative aspect
* To set up a test circuit correctly
* To obtain an appropriate set of data
* To plot the characteristic I-V graph for several components

**Intended class time**

* 45 to 60 minutes

**Equipment (per group)**

* Power supply (max 12V)
* Rheostat/potentiometer
* Ammeter
* Voltmeter
* Leads
* Test components (resistor, filament lamp, diode, LED)

**Health and safety**

* Safe use of electrical circuits
* Work within the limits of voltage and current given by your teacher
* Do not short the cells out

**Task - planning**

1. Use information on p148 to help you to decide on an appropriate circuit to use in your investigation – explain the reasons for the choice you made. 🞏
2. Draw the circuit diagram for the circuit you decide to use. 🞏
3. Note down any safety issues you need to take into account 🞏
4. To measure the characteristic curve for a component you must change the voltage and measure the current, this should include reversing the polarity of the supply to obtain readings for negative voltage – explain how you are going to do this. 🞏
5. Set up your test circuit with a filament lamp – test to find out what the range of current and voltage will be and write them down in your plan. 🞏
6. Draw a data table that will enable you to collect a minimum of 10 pairs of data points between your minimum and maximum voltage values 🞏

**Investigating Electrical Characteristics**

Name:

Date:

**STUDENT**

**Introduction**

In this experiment you will be determining the current – voltage characteristic of an electrical component.

**Aim**

* To plan an experimental procedure with a clear investigative aspect
* To set up a test circuit correctly
* To obtain an appropriate set of data
* To plot the characteristic I-V graph for several components

**Intended class time**

* 45 to 60 minutes

**Equipment (per group)**

* Power supply (max 12V)
* Rheostat/potentiometer
* Ammeter
* Voltmeter
* Leads
* Test components (resistor, filament lamp, diode, LED)

**Health and safety**

* Safe use of electrical circuits
* Work within the limits of voltage and current given by your teacher
* Do not short the cells out

**Task - planning**

1. Use information on p148 to help you to decide on an appropriate circuit to use in your investigation – explain the reasons for the choice you made. 🞏
2. Draw the circuit diagram for the circuit you decide to use. 🞏
3. Note down any safety issues you need to take into account 🞏
4. To measure the characteristic curve for a component you must change the voltage and measure the current, this should include reversing the polarity of the supply to obtain readings for negative voltage – explain how you are going to do this. 🞏
5. Set up your test circuit with a filament lamp – test to find out what the range of current and voltage will be and write them down in your plan. 🞏
6. Draw a data table that will enable you to collect a minimum of 10 pairs of data points between your minimum and maximum voltage values 🞏

**Task – obtaining data**

1. Measure the current as the voltage is changed across the component. 🞏
2. Draw graphs of the current – voltage curves for your component. 🞏
3. Calculate the resistance of the component at several points within your data range. 🞏
4. Describe the characteristic of the component with relation to potential difference, current and resistance. 🞏

**To submit**

For this piece of work to count towards Practical Activity Group 3 of the GCE Physics Practical Endorsement you should have the following evidence:

* Data collected from your group in a clear and logical format – as required by the PSH 🞏
* Current-voltage graphs, drawn according to the guidelines in the PSH 🞏
* Your description of characteristic current-voltage behaviour for each component 🞏

**Task – obtaining data**

1. Measure the current as the voltage is changed across the component. 🞏
2. Draw graphs of the current – voltage curves for your component. 🞏
3. Calculate the resistance of the component at several points within your data range. 🞏
4. Describe the characteristic of the component with relation to potential difference, current and resistance. 🞏

**To submit**

For this piece of work to count towards Practical Activity Group 3 of the GCE Physics Practical Endorsement you should have the following evidence:

* Data collected from your group in a clear and logical format – as required by the PSH 🞏
* Current-voltage graphs, drawn according to the guidelines in the PSH 🞏
* Your description of characteristic current-voltage behaviour for each component 🞏