H

Higher Assignment  
Guide Sheet: Wheatstone Bridge



**Out of balance Wheatstone Bridge.**

**Apparatus**

3 known resistors (approximately 1000 Ω), power supply unit, wires, decade resistance box or board, microammeter or millivoltmeter or galvanometer, resistor, ohmmeter (if required)

**![Diagram of a diagram of a micro ampere

Description automatically generated]()**

**Instructions:**

* Set up the Wheatstone Bridge using 1000 Ω resistors.
* The resistance box should be set to vary the resistance below and above 1000 Ω.
* The bridge has now to be unbalanced by a known small amount and the reading on the voltmeter or ammeter noted.
* Plot a graph of the out-of-balance resistance v current or voltage

**Risk Assessment**

* Do a visual check on all wiring to ensure it is safe. Discuss with a teacher if you have any concerns.
* Do an electrical safety check by observing all the wires.
* Resistors and circuits can get hot, turn off the power to the circuit when not in use and do not touch the circuit.
* Be observant to those around you.
* Do not exceed the maximum voltage across the circuit, discuss the maximum value with your teacher.

**Instructions**

* Teachers must exercise their professional responsibility to ensure that the report submitted is the candidate’s own work.
* No more than 8 hours should be spent on the whole assignment.
* A maximum of 2 hours is allowed for the report stage.
* The instructions for candidates outline the requirements for the assignment. must be given to candidates at the outset.
* Teachers must ensure candidates understand the requirements of the task.
* Teachers must not, at any stage, provide candidates with a template or model answers.

**Experimental research**

* Teachers can supply instructions for the experimental procedure(s).
  + This **must not** include details of range and interval of measurements, and reference to repeats.
* Teachers are responsible for ensuring that appropriate risk assessment has been carried out and that candidates have guidance on the safe and correct use of equipment.
* Teachers **must not** provide candidates with experimental data.
* Teachers **must not** provide a blank or pre-populated table for experimental results.
* Candidates must carry out the experimental work either individually or as part of a small group. (A small group is defined as having two, three or four candidates.)
* Group work may be an appropriate approach in a number of circumstances, for example:
  + to encourage diversity of research topic
  + where experiments are labour- or time-intensive
  + where resources are limited Where candidates work in a group, teachers must ensure every candidate participates in the experimental work.
  + Within the small group, it is acceptable for candidates to share experimental data, but experimental data must not be shared between groups.
* Teachers **must not** provide feedback to candidates on their data. However, where candidates identify a problem with their results and indicate that they wish to repeat the experiment(s), they may do so.

**Mrsphysics takes no responsibility for any health and safety. It is the responsibility of the teacher and student to risk assess any practical activity they complete! It is also the responsibilty of the teacher to check that these experiments meet the specifications. Mrsphysics has done her best to check that these meet the criteria**

* **Sept 2023**