Science Skills Year 8 booklet: 3

Ohm's Law

Task 1 deadline (self-assessed):

Task 2 deadline (peer-assessed):

Task 3 deadline (teacher-assessed):

The tasks in this booklet relate to the investigation below. Read the following information before attempting any of the tasks.

Method:
Set up a circuit which contains a fixed resistor, ammeter and a voltmeter Starting at 0V, take the measurement of the current. Increase the voltage by 0.5V until you reach 5V, measuring the current at each step.

Results:

Voltage Level (V)	Resistance (Ohms)	Current (A)
0.0	10	0
0.5	10	0.05
1.0	10	0.1
1.5	10	0.15
2.0	10	0.2
2.5	10	0.25
3.0	10	0.3
3.5	10	0.35
4.0	10	0.4
4.5	10	0.45
5.0	10	0.5

Task 1

Everyone to do-Match the key terms to the definitions:

Voltage	A flow of electrons.
Current	Also known as potential difference. The difference in energy between two points on a circuit.
Resistance	Something which opposes (goes against) the flow of electros in a circuit.
Voltmeter	A device which measures current.
Ammeter	A device which measures voltage.

Green: you will be tested on the spelling of the five key terms

Amber: you will be tested on the spelling and the definition of the key terms

Red: you will be tested on the spelling and definition of the key terms. You will also need to put each into a sentence

Killer: you will be asked for synonyms for the key terms (if there are any!)

Task 2

Green:

On paper, draw a circuit diagram for the one which was set up in this investigation. Remember to use the correct circuit symbols.

Amber:

The current flowing **through** a resistor at a constant temperature is directly proportional to the voltage **across** the resistor. So, if you double the voltage, the current also doubles. This is called Ohm's Law.

Explain whether or not the data in the table supports this statement.

Red:

The equation for calculating resistance is:

potential difference (volt, V) = current (ampere, A) × resistance (ohm, Ω)

Pick 4 results from the table and calculate the voltage to check the results.

Explain whether or not the data in the table supports the relationship between current through a resistor and voltage being directly proportional.

Task 3:

Green: On a piece of graph paper, plot the results of this investigation. You should put voltage on the x axis (across the bottom) and current on the y axis (up the side). Use a line graph and your scale should be one square for 0.5V and one square for 0.5A.

Amber: On a piece of graph paper, plot a graph of the results. Think carefully about your scale and remember that you should put voltage on the x axis (across the bottom) and current on the y axis (up the side).

Red: On a piece of graph paper, plot a graph of the results. You will not need to plot all pieces of information in the table.