## NEATH PORT TALBOT COLLEGE COLEG CASTELL NEDD PORT TALBOT

## School of Maths & Science Science Practical

# **Investigating Resistors in Series and Parallel**

#### ♦ Aim

To investigate the total resistance of various resistor combinations.

#### **♦** Introduction

In this experiment, you will investigate how the total resistance of different combinations of resistors depends on their arrangement. Your results will enable you to comment on the validity of using the equations for resistors in series and parallel.

### **♦** Safety

#### **Control Measures**

• You are reminded of the need of good laboratory practice in order to maintain a safe working environment.

**Hazards** 

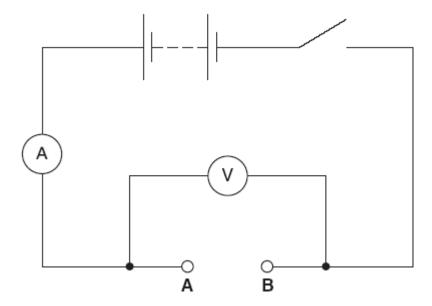


Electrical hazard.

Take care with circuits. Switch off power before connecting and disconnecting the circuit.

### **♦** Equipment provided

Battery pack or power supply of fixed e.m.f. three identical resistors ammeter voltmeter switch connecting leads



- 1. Set up the circuit shown above. Connecting one resistor between A and B
- 2. Record the potential difference, V between  $\mathbf{A}$  and  $\mathbf{B}$  and the current I.

$$V =$$
\_\_\_\_\_V $I =$ \_\_\_\_\_A

3. Calculate the resistance *R*.

$$R =$$

4. It is possible to connect up to three resistors in a number of different combinations. Connect at least six different combinations of resistors between **A** and **B** and repeat steps **2** and **3**. Record your results in a table. Include sketches of resistor arrangements and values of *R*.

For each combination calculated same resistance as calculated			esistance R assuming each resistor has the
The following relationships m For resistors in series: $R = R1$ For resistors in parallel:			1:
1	$\frac{1}{R}$ =	<u>1</u> + R1	$\frac{1}{R2} + \dots$

Comment on how your measured values of resistance compare to the calculated values of <i>R</i> obtained in step 5. Describe and explain your observations using relevan knowledge and understanding of physics. Refer to any other observations you have made during your experiment. You should discuss whether the formulae for resistors in series and parallel apply for the resistor combinations you have used.				