

Chapter 19 Electric circuits

Short investigation 19.2: Series and parallel circuits

Name:

Aim

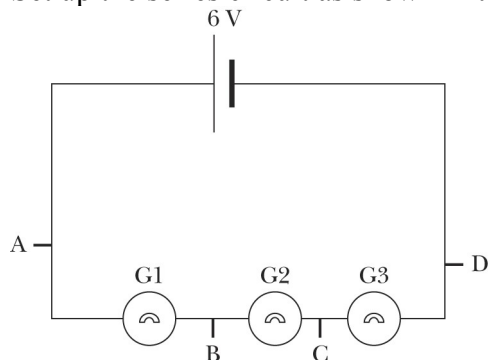
To investigate the current and voltage in series and parallel circuits

Materials

3 light bulbs, 6 V DC power supply, connecting wires, voltmeter, ammeter

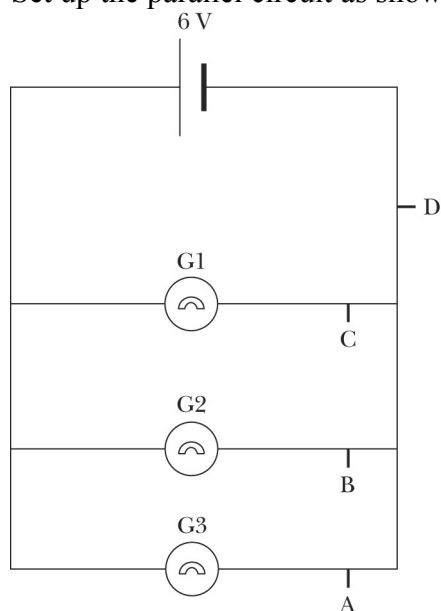
Method

1. Set up the series circuit as shown in the figure below.



2. Measure the voltage across each of the bulbs individually and then across all three bulbs. Enter your values into table 19.2A.
3. Measure the current moving through the circuit at points A, B, C and D. Enter these values into table 19.2B.

4. Set up the parallel circuit as shown in the figure below.



5. Measure the voltage across each of the bulbs individually and then across the power supply. Enter your values into table 19.2C.
6. Measure the current moving through the circuit at points A, B, C and D. Enter these values into table 19.2D.

Results

Table 19.2A: Voltage in a series circuit

V_1	V_2	V_3	V_{123}

Table 19.2B: Current in a series circuit

I_A	I_B	I_C	I_D

Table 19.2C: Voltage in a parallel circuit

V_1	V_2	V_3	V_{ps}

Table 19.2D: Current in a parallel circuit

I_A	I_B	I_C	I_D

Analysing the results

1. (a) For the series circuit, compare the value of $(V_1 + V_2 + V_3)$ with the value of V_{123} .
 (b) What does this suggest about the voltage of resistors in series?
2. What do your results indicate about the current moving through a series circuit?
3. (a) For the parallel circuit, compare the value of $(I_A + I_B + I_C)$ with the value of I_D .
 (b) What does this suggest about the current in parallel circuits?
4. What do your results indicate about the voltages in a parallel circuit?
5. Use your results to determine the average resistance of your globes.
6. What is the effective resistance of the globes in:
 - (a) the series circuit?
 - (b) the parallel circuit?

Conclusion

Describe the voltage and current relationships in series and parallel circuits.

Notes: