

Physics - Key Stage 3

Lesson 4- Electricity and Magnetism

Potential Difference - Download

Miss White



Questions from video



Quick Check 1

1. What is the difference between a series and parallel circuit?
2. What is current?
3. What would you expect to record if you measured the current at different locations around a series circuit?
4. What would you expect to record if you measured the current at different locations around a parallel circuit?



Quick check 1 - Hints

1. What is the difference between a series and parallel circuit?

A series circuit has _____ loop whereas a parallel circuit has _____ or more loops.

2. What is current?

Current is the _____ of flow of _____.

3. What would you expect to record if you measured the current at different locations around a series circuit?

Current is the _____ everywhere in a series circuit

4. What would you expect to record if you measured the current at different locations around a parallel circuit?

The total sum of the current in the branches is _____ to the current leaving the cell



Quick Check 2

1. What is potential difference measured in?
2. What is the symbol for p.d.?
3. What piece of equipment is used to measure potential difference?

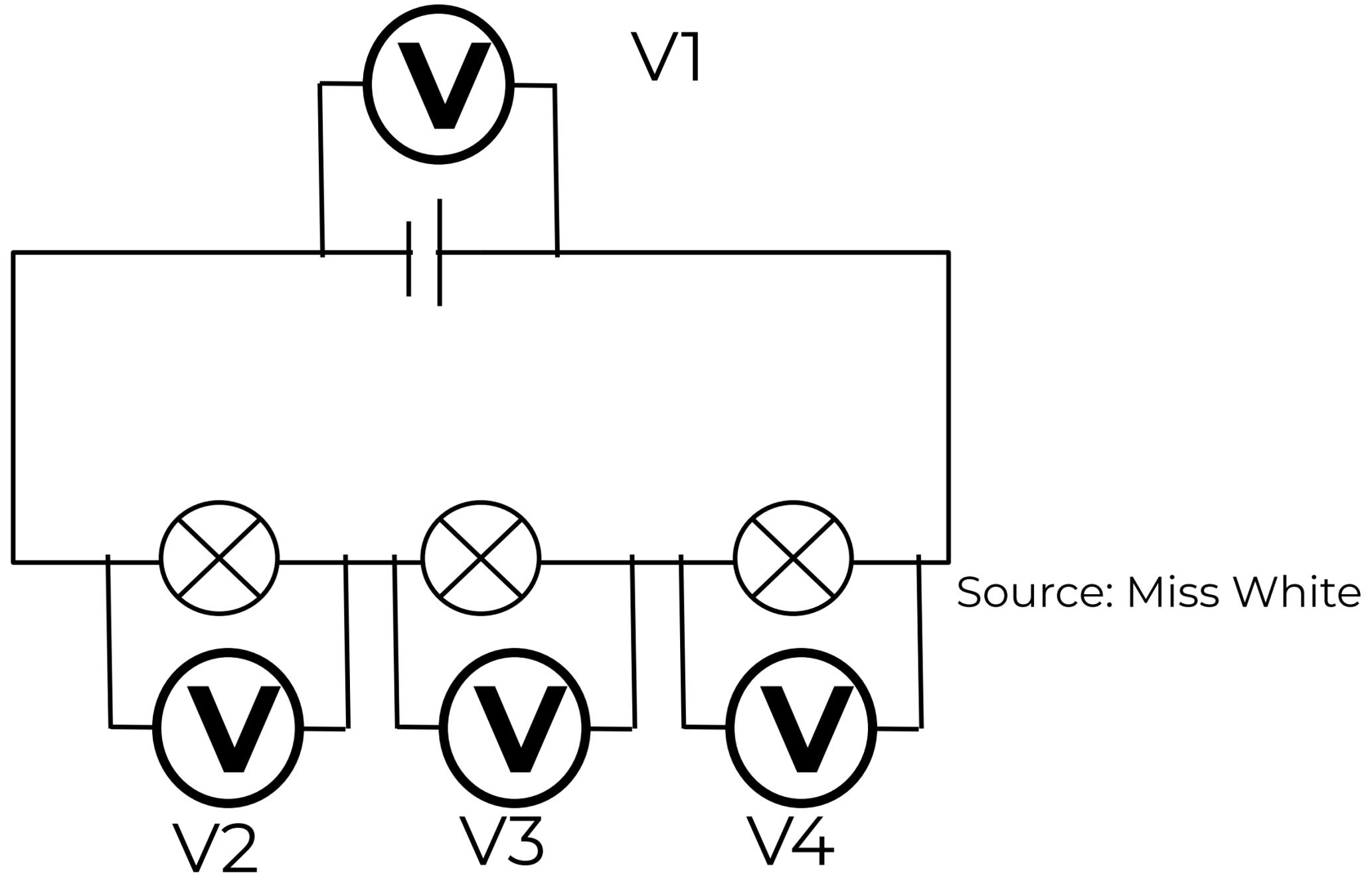


Task 1

- 1) Draw a series circuit with one cell and one lamp.
- 2) Connect the voltmeter to measure p.d. across the lamp.
- 3) Describe how the voltmeter is connected.



Investigating p.d. in a series circuit



Results

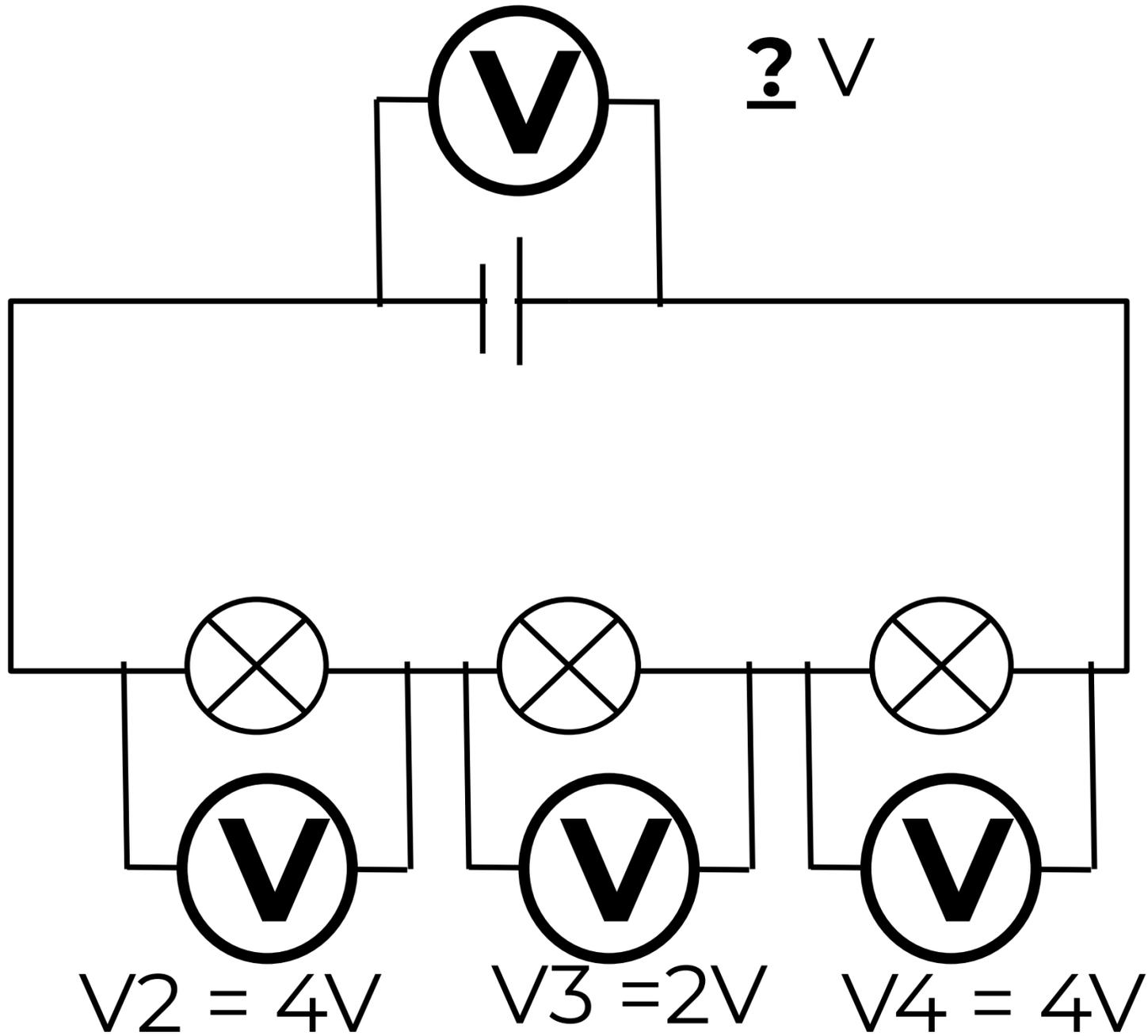
Here are the students results

1. Explain the how the results are related to one another.
2. Explain how the p.d across each component is related to the p.d. across the cell in a series circuit

Position	Potential difference (V)
V1	12.00
V2	4.00
V3	4.00
V4	4.00



Calculate the missing potential difference

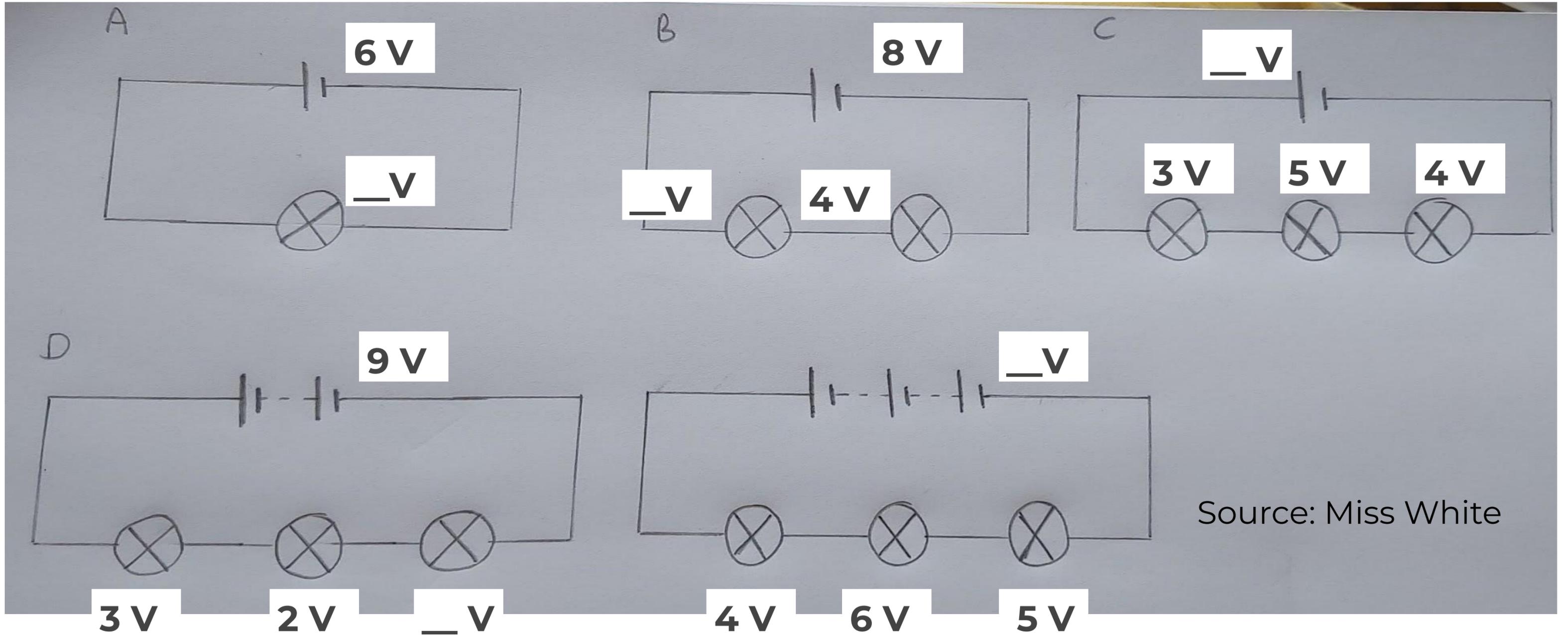


Source: Miss White



Task 2

Below are some circuit diagrams. Work out the missing values.



Source: Miss White



Answers



Quick check 1 - answers

1. A series circuit has **one** loop whereas a parallel circuit has **two** or more loops.
2. Current is the **rate** of flow of **charge**.
3. Current is the **same** everywhere in a series circuit
4. **The total sum of the current in the branches is equal to the current leaving the cell**



Quick check 2 - answers

1. What is potential difference measured in?

Volts

2. What is the symbol?

V

3. What piece of equipment is used to measure potential difference?

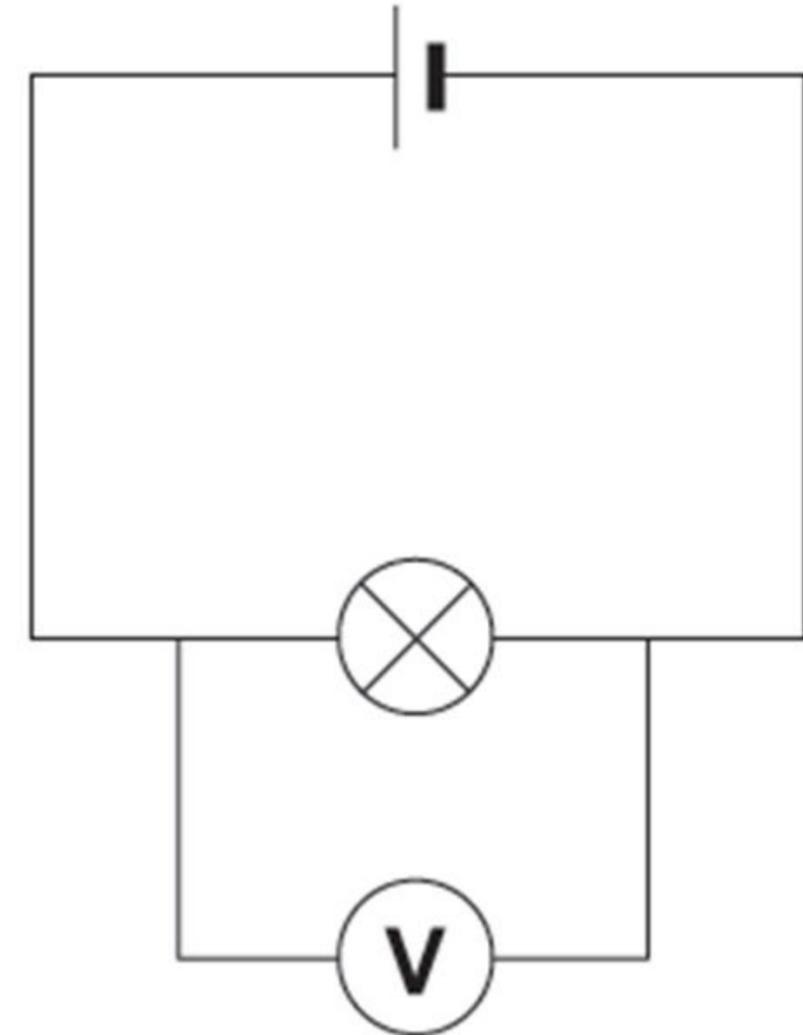
Voltmeter



Task - answers

1 & 2. See image

3. The voltmeter is connected in parallel across the lamp



Source: Mr Littlewood



Results - answers

1. V_1 is the total of V_2 , V_3 and V_4
2. p.d is shared in the same proportion as the resistances as they all have the same current through them

Position	Potential difference (V)
V_1	12.00
V_2	4.00
V_3	4.00
V_4	4.00



Results

$$V1 = V2 + V3 + V4$$

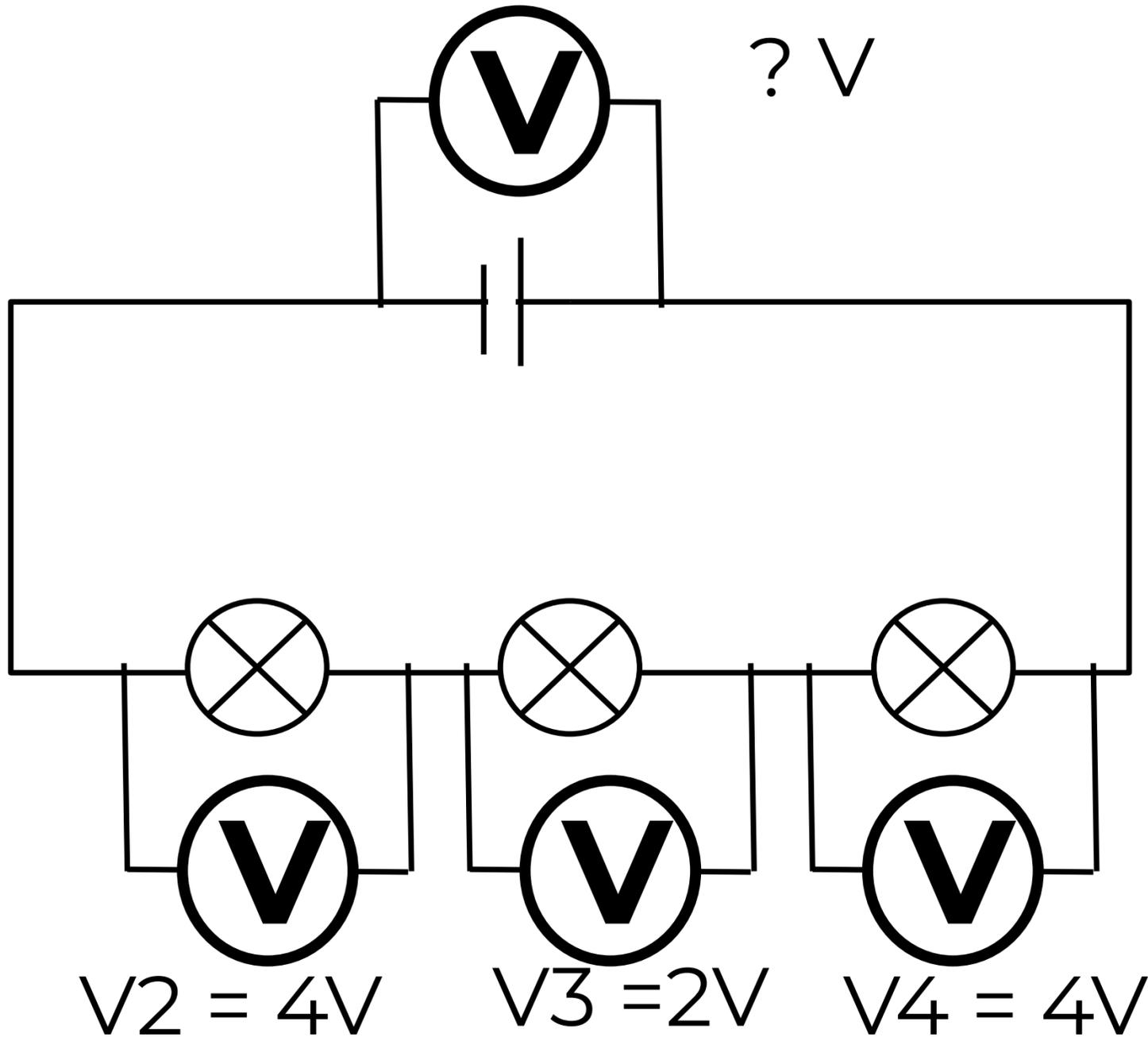
Here are the students results

$$\text{Input} = \text{Output}$$

Position	Potential difference (V)
V1	12.00
V2	4.00
V3	4.00
V4	4.00



Calculate the missing potential difference - answers



INPUT = OUTPUT

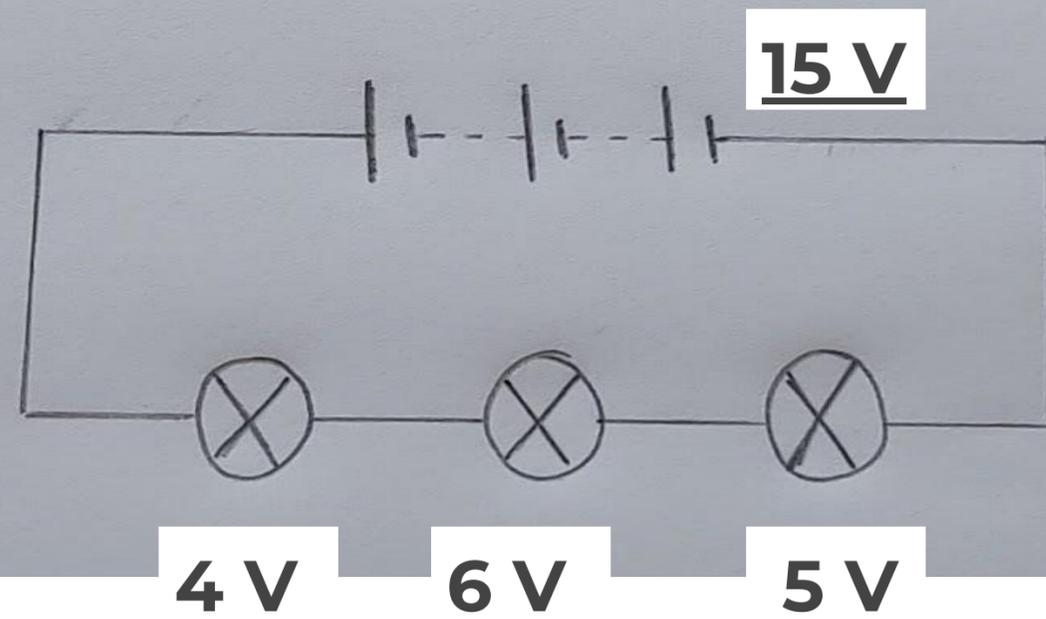
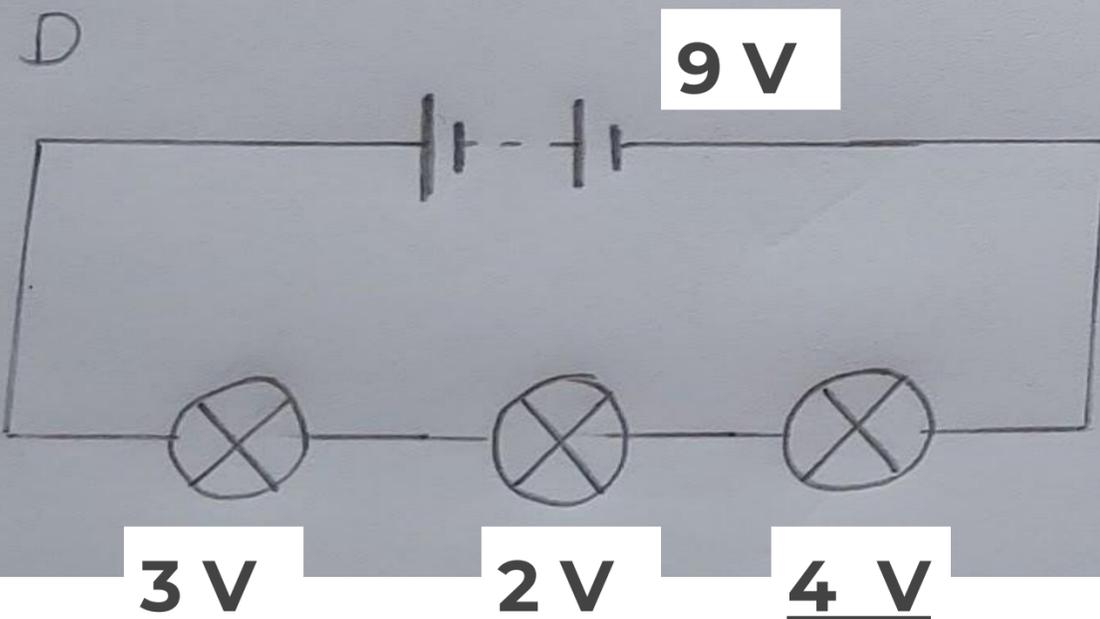
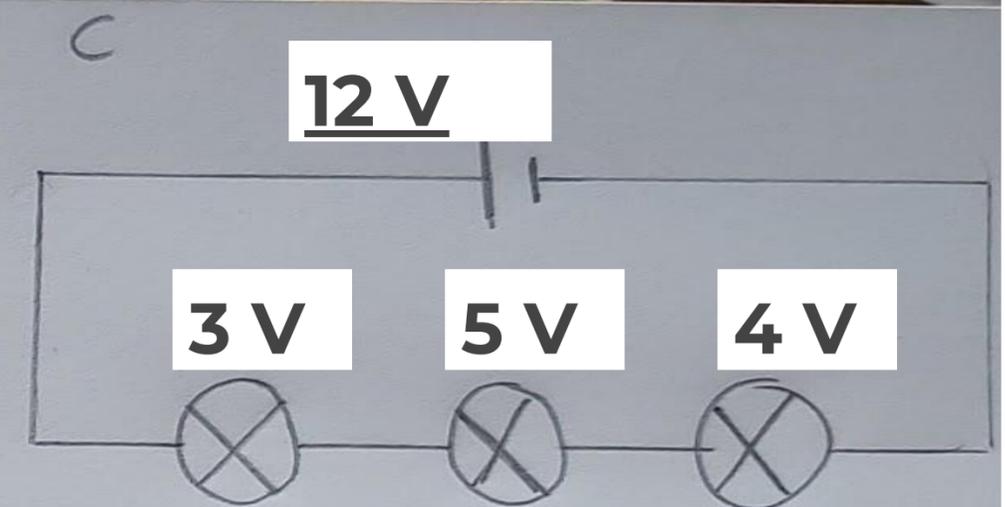
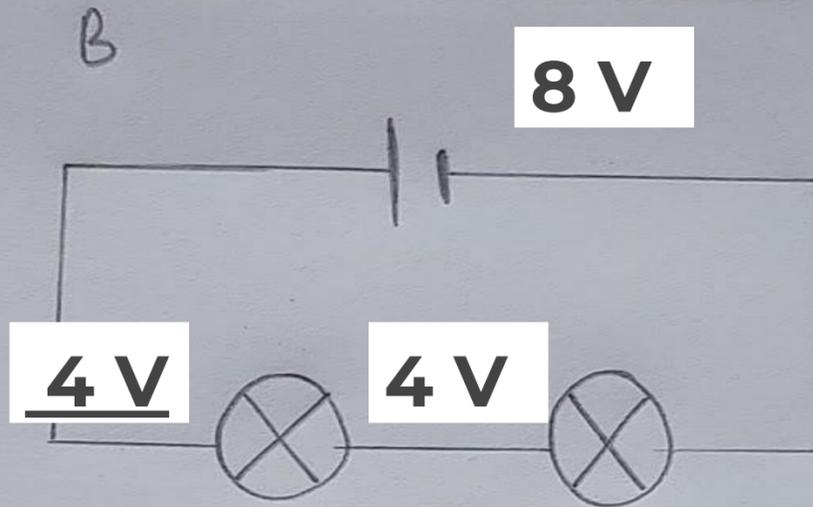
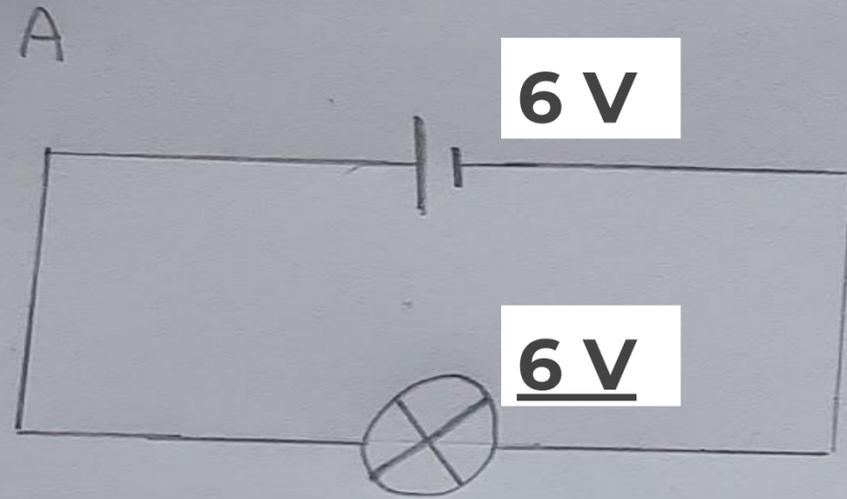
$$V_1 = 4 + 2 + 4$$

$$V_1 = \underline{10V}$$

Source: Miss White



Task 2 - answers



Source: Miss White

