Experiment 1: Page 125

Aim: To investigate the division of potential difference in a series circuit.

Investigative question:
How does the sum of all the potential differences in the series circuit compare to the potential difference over the battery?

Questions:
1. What are the readings on V_T, V_1, V_2 and V_3?

$V_T = 9$ V $V_1 = 3$ V $V_2 = 3$ V $V_3 = 3$ V (as an example)

2. What is the mathematical relationship between these readings?

$V_T = V_1 + V_2 + V_3$

3. What happens to the potential that is supplied by the battery in a series circuit?

The potential is divided between the resistors, so that the sum of the potential across each resistor is equal to the potential that the battery delivers.

4. Why is the switch closed for just a short period of time?

To prevent the conducting wires from heating up and influencing the readings on the meters.

Conclusions:
The sum of all the readings on the voltmeters in a series circuit is equal to the reading on the voltmeter over the battery.
$V_T = V_1 + V_2 + V_3$

Experiment 2: Page 126

Aim: To investigate the division of potential difference in a parallel circuit.

Questions:
1. What are the readings on V_T, V_1, V_2, V_3 and V_4 when the switch is closed?

$V_T = 9$ V $V_1 = 9$ V $V_2 = 9$ V $V_3 = 9$ V $V_4 = 9$ V (as an example)

2. What is the mathematical relationship between these readings?

$V_T = V_1 = V_2 = V_3 = V_4$

3. What happens to the potential that is supplied by the battery in a parallel circuit?

The potential is the same across each resistor, as well as over the whole parallel combination.

4. What application of this do we use in our homes?

The wiring in houses has parallel connections so that the potential over all the lights and wall sockets is the same, and they can be operated individually.

Conclusions:
The voltmeter readings over each resistor in a parallel combination, as well as the reading over the whole combination, are all the same. Because there are no other resistors in series in the circuit, the readings will be the same as that of the battery.
$V_T = V_1 = V_2 = V_3 = V_4$