

Series and Parallel Circuits

Aim: to make observations of current and voltage in series and parallel circuits.

Equipment:

- 3 bulbs
- Battery or other power source
- Voltmeter
- Ammeter
- Connecting wires
- Circuit photos

Safety Information

Circuit components –electrical shock.



Do not handle with wet hands. Check all equipment for damage or faults.

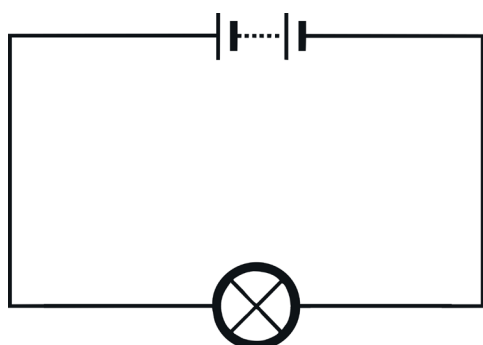


Fig 1

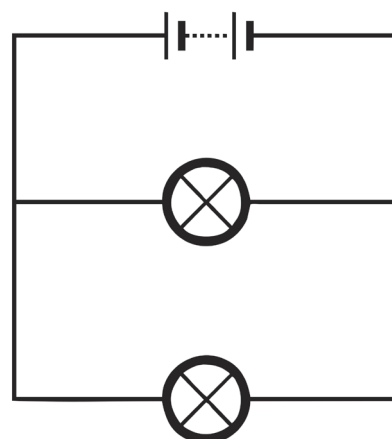


Fig 2

Method (series circuit):

Step 1: Set up the series circuit as shown in figure 1 above.

Step 2: Complete the circuit and measure and record the current and voltage at the bulb.

Step 3: Reconstruct the series circuit to include 2 bulbs.

Step 4: Complete the circuit and measure and record the current and voltage at one of the bulbs.

Step 5: Reconstruct the series circuit to include 3 bulbs.

Step 6: Complete the circuit and measure and record the current and voltage at one of the bulbs.

Method (parallel circuit)

Step 1: Set up the parallel circuit as shown in figure 2 above.

Step 2: Complete the circuit and measure and record the current and voltage at one of the bulbs.

Step 3: Reconstruct the series circuit to include 3 bulbs.

Step 4: Complete the circuit and measure and record the current and voltage at one of the bulbs.

Results:

Number of bulbs	Current, A		Voltage, V	
	Series	Parallel	Series	Parallel
1				
2				
3				

Questions:

1. How was the current in the series circuit affected by increasing the number of bulbs?
2. How was the current in the parallel circuit affected by increasing the number of bulbs?
3. How was the voltage in the series circuit affected by increasing the number of bulbs?
4. How was the voltage in the parallel circuit affected by increasing the number of bulbs?
5. Compare the effect of the number of bulbs on the current of series and parallel circuits.
6. Compare the effect of the number of bulbs on the voltage of series and parallel circuits.

Series and Parallel Circuits **Answers**

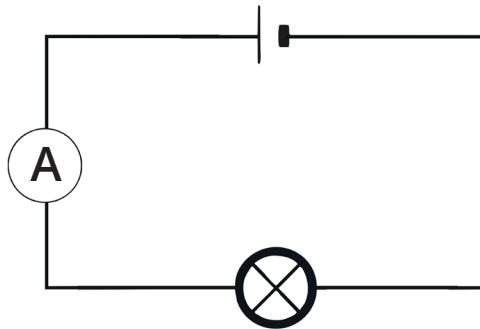
1. How was the current in the series circuit affected by increasing the number of bulbs?
The current remains the same / unchanged in a series circuit.
2. How was the current in the parallel circuit affected by increasing the number of bulbs?
The current is shared between the number of branches / bulbs in the parallel circuit.
3. How was the voltage in the series circuit affected by increasing the number of bulbs?
The voltage is shared between the bulbs in a series circuit.
4. How was the voltage in the parallel circuit affected by increasing the number of bulbs?
The voltage remains the same for all bulbs in a parallel circuit.
5. Compare the effect of the number of bulbs on the current of series and parallel circuits.
Changing the number of bulbs in a series circuit has no effect on the current, whereas in a parallel circuit the current is shared between the branches.
6. Compare the effect of the number of bulbs on the voltage of series and parallel circuits.
Changing the number of bulbs in a parallel circuit has no effect on the voltage supplied to each bulb, whereas in a series circuit the voltage is shared between the bulbs.

Support: Measuring current and voltage in a circuit

What the circuit symbols mean

Bulb		Cell	
Ammeter		Battery	
Voltmeter			

To measure the current in the circuit you need to attach the ammeter in series (in line with) with the component.



To measure the voltage in the circuit you need to attach the voltmeter in parallel (branched around) the component you are measuring.

