Activity sheet

Investigating electric circuits

Name: _____

Class: _____

These circuits can be assembled in the laboratory or online using Yenka.

Materials

- switch
- battery holder
- 4 × 1.5 V batteries
- 10 crocodile connectors per group
- voltmeter
- ammeter
- 4 light globes

Method

A switch is always connected to avoid unnecessary running down of the batteries.
Assemble the following circuits and observe the changes shown on the meters.

1 Connect the four batteries to make a 6 volt supply.

2 Connect the switch to one end of the battery holder.

3 Connect the voltmeter across the battery; verify the voltage is 6 volts.

4 Connect the ammeter to a light globe. Connect this combination to the switch at one side and the battery holder on the other.
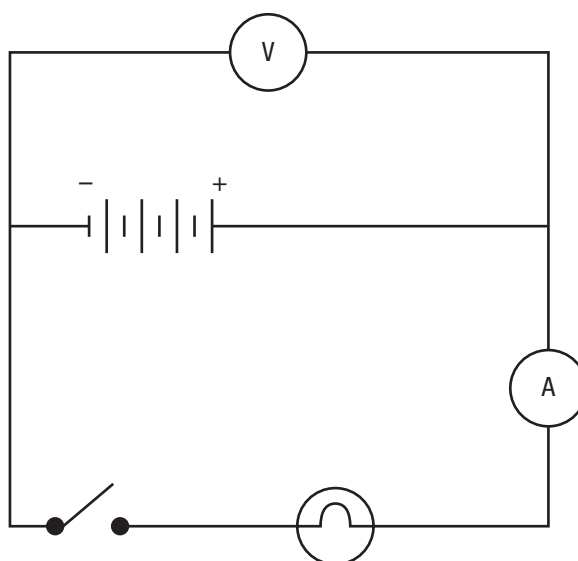
5 Depress the switch and record the current through the light globe.

6 Add another light globe between the switch and the other light globe.

7 Depress the switch and record the current through the two light globes.

8 Repeat for three and four light globes.

9 Draw a graph of your results, with the independent variable (number of light globes) across the horizontal axis. The dependent variable (current) will be plotted on the vertical axis.
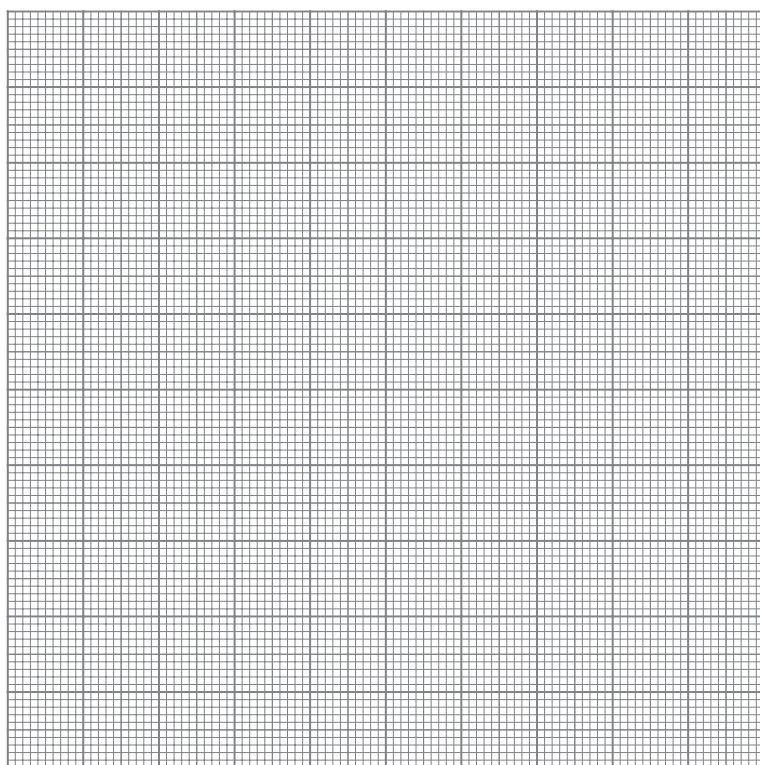
10 Predict the current for five and six light globes.

This circuit is a series circuit; the current is the same for each circuit element. If one light globe is disconnected, all lights go out.

A parallel circuit has each light globe connected by two wires to each light globe.

11 Connect the switch, battery holder and one light globe as before.

12 Connect the next light globe by each wire to each side of the first light globe. In this case, the voltage is the same for each light globe, but the current changes.

13 Depress the switch and record the current.

14 Add three and four light globes and record the current in each instance.

15 Plot your recorded data onto the same set of axes as the series circuit data.