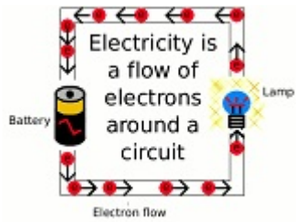
Intermediate Science 9

Unit 3: CURRENT ELECTRICITY

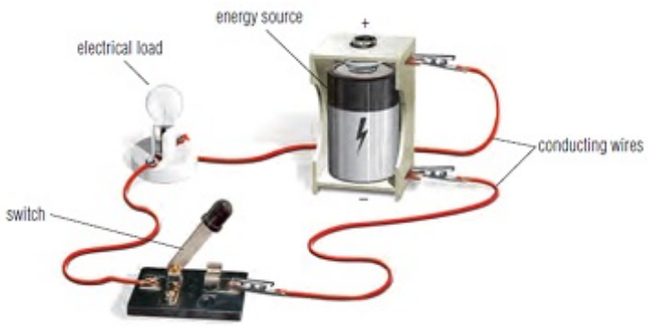
WORKSHEET 1: ELECTRIC CURRENT AND CIRCUITS

Current Electricity: Electricity produced due to the flow of electric charge from one place to another in a conductor



Current (I) refers to the flow of charges in a circuit. It is the amount of charge passing a point every second. It is measured in Amperes or Amps (A).

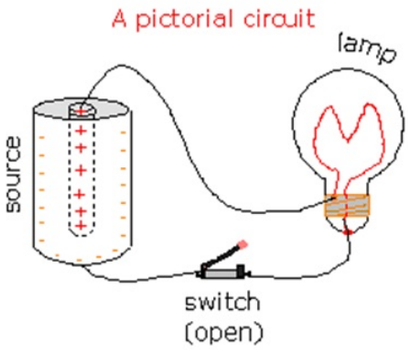
Electric Circuit: a complete pathway that allows electrons to flow from the source and back again

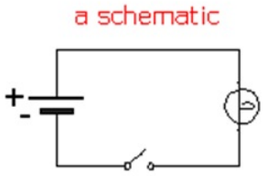


An electric circuit can be considered a system consisting of four subsystems:

1. *Source*	a device which changes one type of energy into electrical energy, example a chemical cell or generator.
2. *Conductor*	a material which allows electric current (electrons) to pass through it easily, example copper wire
3. *Control*	starts and stops the flow of electrons in an electric circuit, example switch
4. *Load*	the device which changes electrical energy into some other form of energy, example motor, light bulb

Schematic Diagram: a circuit diagram which shows the logic of the connections rather than the actual layout of the components. A diagram using graphic symbols to show how a circuit functions electrically.





Sample electrical circuits and symbols

Symbol	Component	Function
	wire	conductor; allows electrons to flow
	cell, battery	electrical source; longer side is the positive terminal, shorter side is the negative terminal
	lamp (light bulb)	specific load; converts electricity to light and heat
	resistor	general load; converts electricity to heat
	switch	opens and closes the circuit
	ammeter	measures current through a device, connected in series
	voltmeter	measures voltage across a device, connected in parallel

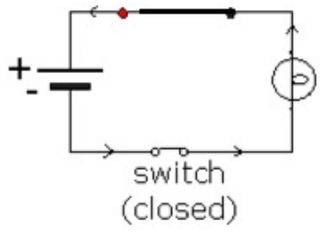
RULES for Drawing Circuit Diagrams

- Always use a ruler to draw straight lines for the conducting wires
- Make right-angle corners (⌙) so that your finished diagrams is a rectangle
- Contain 4 basic parts: (1)Electrical source, (2) Switch, (3) Load, (4) -Conducting wire

Open Circuit And Closed Circuit

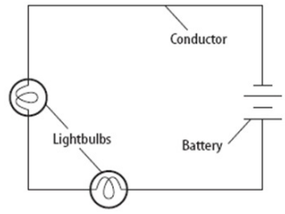
Open circuit: when the flow of electrons is interrupted and the electrons cannot move through the circuit. (Switch is Opened)

Closed Circuit: when there is a flow of electrons throughout the circuit. (Switch Closed)

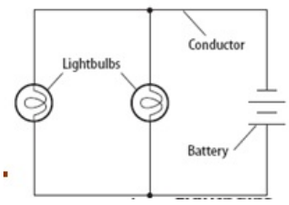


Series Circuit and Parallel Circuit:

Series circuit: provides a single pathway for the current to flow. If the circuit breaks, all devices using the circuit will fail.



Parallel Circuit: has multiple pathways for the current to flow. If the circuit is broken the current may pass through other pathways and other devices will continue to work.



PART A: MULTIPLE CHOICE

1. Which of the following describes the flow of electrons around a circuit?

   (A) Conductor
   (B) Current Electricity
   (C) Insulator
   (D) Static Electricity

2. Which term below refers to the flow of charges in a circuit?

   (A) Circuit
   (B) Current
   (C) Load
   (D) Source

3. What unit is used to measure current?

   (A) Amperes (A)
   (B) Coulomb (C)
   (C) Meter (m)
   (D) Voltage (V)

4. How would you describe current?

   (A) The amount of electrons passing a point in a given time
   (B) The amount of protons passing a point in a given time
   (C) The number of electrons at rest in a circuit
   (D) The number of protons at rest in a circuit

5. What is an electric circuit?

   (A) An incomplete pathway that allows electrons to flow from the source and back again
   (B) A complete pathway that allows electrons to flow from the source and back again
   (C) A complete pathway that allows protons to flow from the source and back again
   (D) An incomplete pathway that allows protons to flow from the source and back again

6. Which of the following is required to build a complete electric circuit?

   (I) Source
   (II) Conductor
   (III) Control (switch)
   (IV) Load

   (A) (I) only
   (B) (I) and (II)
   (C) (I), (II), and (III)t
   (D) (I), (II), and (III) and (IV)

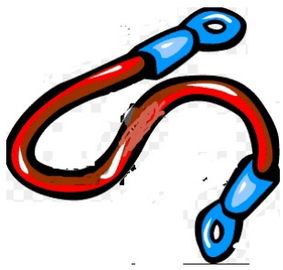
7. Which of the following refers to an electric device that changes electrical energy into some other form?

   (A) Source
   (B) Conductor
   (C) Control (switch)
   (D) Load

8. What is shown in the picture to the right?

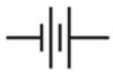
(A) Source
(B) Conductor
(C) Control (switch)
(D) Load

9. What is shown in the picture to the right?



(A) Source
(B) Conductor
(C) Control (switch)
(D) Load

10. What is depicted in the picture to the right?

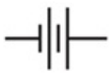


(A) Cell
(B) Lamp
(C) Ammeter
(D) Wire

11. What is depicted in the picture to the right?

(A) Cell
(B) Lamp
(C) Ammeter
(D) Wire

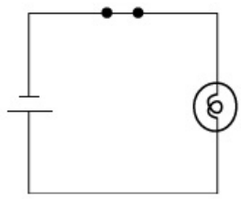
12. Which of the following is a symbol for a resistor?

(A)	
(B)	
(C)	
(D)	

13. Which of the following best describes an open circuit?

(A) The flow of electrons is uninterrupted and the electrons can move through the circuit
(B) The flow of electrons is interrupted and the electrons can move through the circuit
(C) The flow of electrons is uninterrupted and the electrons cannot move through the circuit
(D) The flow of electrons is interrupted and the electrons cannot move through the circuit

14. What is illustrated in the below picture?

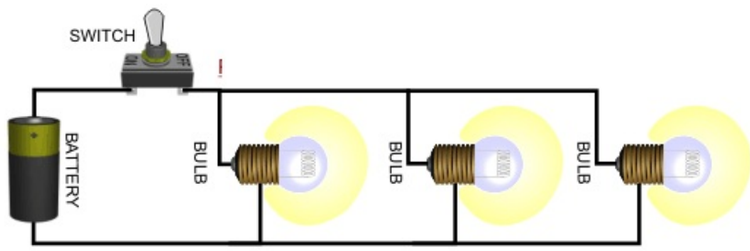


(A) Closed circuit
(B) Fried circuit
(C) Open circuit
(D) Parallel circuit

15. Which of the following is the best definition of a series circuit?

(A) Provides a single pathway for the current to flow.
(B) Provides multiple pathways for the current to flow
(C) All devices using the circuit will continue to work if the current is interrupted anywhere in the circuit
(D) Only some devices using the circuit will continue to work if the current is interrupted anywhere in the circuit

16. What type of circuit is shown below?



(A) Fired circuit
(B) Series circuit
(C) Open circuit
(D) Parallel circuit

17. What device is used to measure current?

(A) Ammeter
(B) Odometer
(C) Thermometer
(D) Voltmeter

18. How should an ammeter be placed in an electric circuit?

(A) Parallel
(B) Series
(C) Parallel or series
(D) Diagonal

1. Define electric current. What units are used to measure current?

2. (A) Define electric circuit.

3. Distinguish between and open and closed circuit.

4. Distinguish between a series and parallel circuit.

5. Explain the difference between static electricity and current electricity.

Static Electricity	Current Electricity