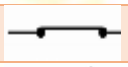
Introduction

- We have played a game called “how steady is your hand?” in this game we make an arrangement by using various electric components like electric cell, electric wires, metallic objects, electric bulb and switch.
- In this game if the electric bulb glows up then we lose the game.
- We all know that the light only glows up when the circuit is complete hence, we make sure that circuit should not be complete.
- These electrical components have their specific symbols.
- We use these symbols to draw a circuit and different symbols represent different electric components.
- We use various electric components to set up the game.

Symbols of electric components

S. No.	Electric component	Symbol
1	Electric cell	
2	Electric bulb	
3	Switch in ‘ON’ position	
4	Switch in ‘OFF’ position	
5	battery	
6	wire	

- Battery is a combination of two cells in which positive terminal of one cell is connected to the negative terminal of another cell.
- Batteries is used in many devices such as torches, transistors, toys, TV remote controls etc. in many devices, cells are not placed one after another they may be side by side.
- We can also make battery. Take a cell holder and place two cells such that the positive and negative terminals are connected of adjacent cells and then to the two metal clips connect a piece of wire.

➢ Activity 1

1. Make an electric circuit just like the one we made in class 6.
2. We know that the bulb will only glow when the circuit is complete and connected that means in switch on position the bulb will glow.
3. Now make the circuit diagram in switch on position in your notebook using the symbol of electric components.
4. And now, make another circuit in switch off position.

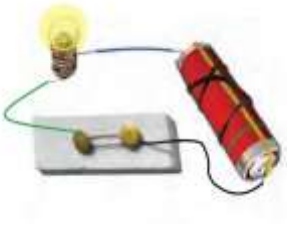


Figure 1 closed electric circuit

Figure 2 open electric circuit

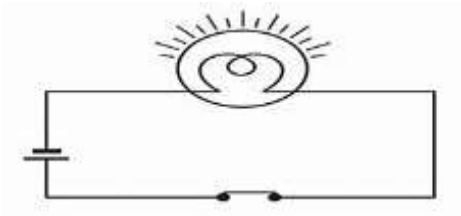


Figure 3 closed circuit diagram

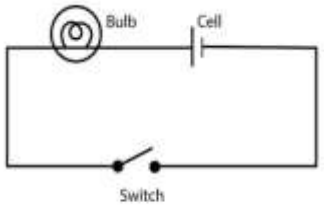


Figure 4 open circuit diagram

- Figure 3 is the circuit diagram of figure 1 which shows a closed circuit. When the circuit is closed the current flows through the circuit and bulb glows up.
- Figure 4 is the circuit diagram of figure 2 which is open. When the circuit is open the current does not flow through the circuit and bulb does not glows up.
- When the current flows the thin wire inside the bulb which is known as filament heats up and that is why bulb glows up.

Heating effect of electric current

➢ Activity 2

1. Just like the circuit that we shown in figure 1 make an another circuit with an electric cell, a bulb, a switch and connecting wires.
2. Touch the bulb when the switch is off that means when the circuit is open.
3. You will observe that the bulb is not warm.
4. Now switch on and make the circuit complete.
5. Now touch the bulb again you observe that the bulb is heated up now.

- The bulb get hot because of the flowing current in the circuit.
- When any component get hot due to flowing the flowing current current this effect is called is heating effect of electric current.
- Many of the electric appliances work on this property of electric curent like an electric heater, electric iron, filament of an electric bulb.
- Materials, length and thichkness of wire affects the heating effect of electric current that is why wires of different length different material and different thickness are used for different purpose.
- Electric bulb produces lot of heat which result in wastage of heat so we can use CFLs (compact flourescent lamps) instead of electric bulbs.

- Some wires are made of special materials known as electric fuse. When heavy currents passes through those wires they brake or melt quikly.
- This electric fuse are inserted in all the electrical circuits of our houses to protect the electric circuits from damages because there is a certain limit of elecric current which can smoothly pass through the circuit if that limit exeeds the wires may cause fire because of overheating.
- For different types of purposes different fuses are used.
- So, fuse are used as a safety device because it breaks down when the current exeeds its limit and hence it breaks the path the of electric current and protect the electric ciruit.
- Now a days MCBs (miniature circuit breakers).when the current exeeds the certain limit these switches automatically get turned off.
- You can again complete the circuit the by turning on the switches.

Magnetic effect of electric current

➢ Activity 3

1. Make a tester using a discarded tray of match box, electric wires, a needle, a battery
2. Wrap the tray with electric wire and place a magnetic needle inside it.
3. Now connect one end of the wire to a terminal of the battery and leave another end free.
4. Now take another piece of wire and connect it to another terminal of battery and leave the other end free.
5. Now join these two ends with a metallic conductor.
6. This conductor will complete the circuit and the needle will show the deflection.

- From the above activity we can conclude that megnetic needle shows deflection when current flows through the nearby wire.
- Hans christian oersted was the first scientist who observed the deflection of needle because of the flow of current.

Electromagnet

- Electromagnets are such coils which behave as a magnet when current pass through them and losses its magnetic property once the electric current is switched off.
- Electromagnets are used in toys, strong electromagnets are attached to the crane to lift heavy matrials such as cars buses almiras atc.
- Tiny electromagnets are used by doctor to take out the small pieces of magnets from our eyes that have fallen accidentally.

Electric bell

- An electric bell has an electromagnet in it.
- The coil wound on an iron piece act as an electromagnet.
- Close to that coil which acts as an electromagnet an iron strip with hammer at one end is kept.
- The current flows the coil and make it an electromagnet when iron stips touches the screw.
- The iron strip is then pulled by it .
- And then the hammer starts to strike the gong of bell.
- But when the iron strip is pulled by the electromagnet which breaks the path of the current and circuit gets broken.
- At this point coil no longer attracts the iron strips as it is no longer an electromagnet.
- Again the iron strip will come back to its original place and the process will repeat again.
- Everytime the circuit is completed the hammer will strike the gong and bell will ring.