

DOMESTIC APPLIANCE MAINTENANCE

Lesson 1: Teacher's guide

Switch as a safety device



A. Understanding the role of switch as safety device in an electrical circuit



B. Competencies

Main Competency: Safely handle simple tools, electrical components, and potentially hazardous materials.

Sub Competencies:

1. Demonstrate proper handling of basic tools.
2. Handle electrical components (e.g., wires, bulbs) with care to avoid damage or injury.
3. Appreciate the purpose and importance of a switch in the allowing the flow of electricity in a circuit.
4. Explain the function of basic electrical components in simple terms (e.g., “A switch allows/does not allow the flow of electricity”).
5. Correctly identify components such as switches, wires and bulbs in appliances.
6. Describe how components interact in a basic circuit (e.g., a switch turns the bulb on/off).
7. Match components to their symbols in circuit diagrams.

C. Learning outcomes

By the end of this lesson, students should be able to show an understanding of:

1. the safety aspects of DC circuits
2. series circuits
3. the function of a switch as a safety device, and how it controls the flow of current in a circuit.

D. Resources and materials

Set of items for students working in groups of 4:

For activity:

- Two 1.5V cells type C cells and holder
- Connection wires
- 3 bulbs (rated for 2.5V)
- One blown bulb
- 4 bulb holders
- 1 switch

For worksheet:

- Torch with cells

E. Implementation guidelines

Introduction

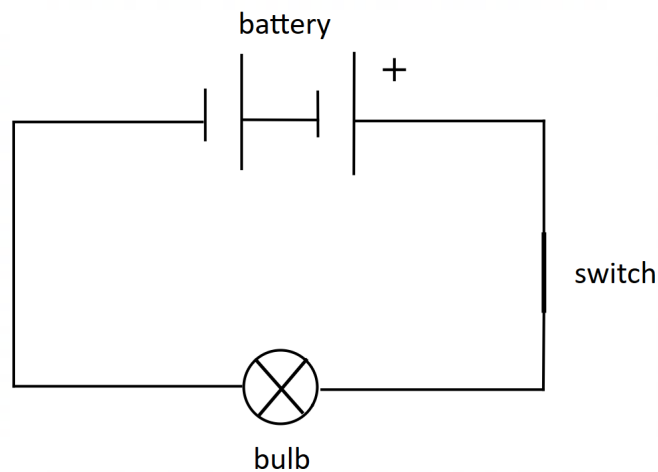
- ***Begin with a brief discussion on electrical safety:***
 1. Explain the importance of handling wires, batteries, and bulbs safely (bulb might be **hot**).
 2. Why it is important to unplug appliances before fixing them?
- ***Introduce symbols and functions of a battery (of cells), wire, switch and bulb using a simple diagram on the board. (Symbols introduced will be used for exploded diagram and reading manuals).***

Activity: Building a Series Circuit

Instructions:

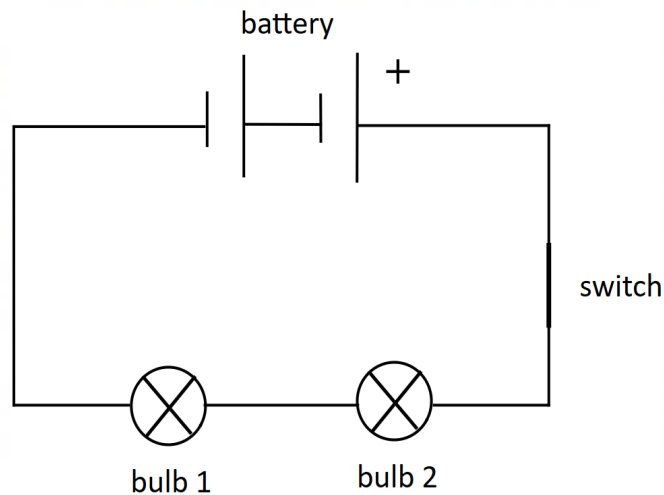
1. Students will work in groups of 4 persons.
2. Provide each group with materials to build a simple series circuit with one bulb.
3. Guide them to connect the components in the correct order:

battery → wire → switch → bulb → wire → battery

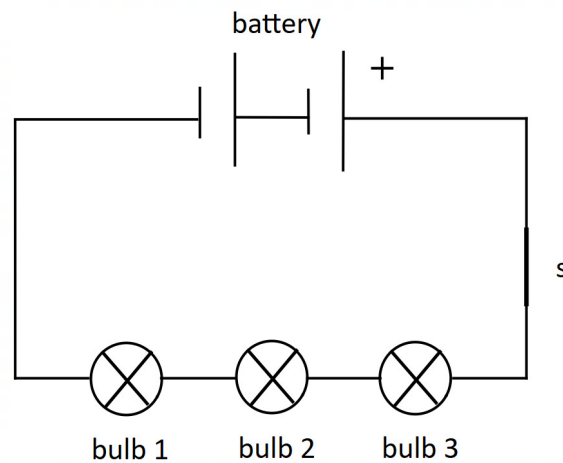


Switch-on the circuit.

4. Ask students to observe whether the bulb lights up and discuss why it does or does not.
5. Ask the students to switch off the circuit. Add a second bulb in series and predict what will happen to the brightness of the bulbs. Switch-on to confirm the prediction.



6. Ask the students to switch off the circuit. Add a third bulb (blown one) in series and predict what will happen to the brightness of the bulbs. Switch-on to confirm the prediction.



7. Ask students to explain their observation / what might be the cause of these observations.
8. **Highlight the importance of switching off** before replacing the third (blown one) bulb with a good one.
9. Replace the third (blown) bulb with a correct one and observe the brightness of each bulb.

Safety Aspect:

- Remind students not to touch bare wires in an electric circuit.
- Importance of a switch in a circuit to stop/allow the flow of electric current.
- Discuss about electrical safety during maintenance.
- Why is it important to unplug appliances before fixing them?
- Relate this activity to the concept of breaking a circuit to stop the flow of electricity.

Conclusion

- Recap the key points:
- How series circuits work and their limitations.
- Encourage students to reflect on what they learned about safety and troubleshooting.
- A switch controls whether electricity flows through a circuit.
- Switches are important for safety because they allow us to stop the flow of electricity when needed.
- **Always switch off the main supply** before any doing any electrical repair at home.

F. ASSESSMENT(in worksheet)

G. Extension of activity

Encourage student to reflect on whether:

- I. light bulbs in the house, and
- II. chasing light bulbs

are connected in series. The teacher may seize this opportunity to mention that there is another type of connection, namely parallel connection, that is also used.