

DOMESTIC APPLIANCE MAINTENANCE

Lesson 7: Teacher's guide

Electrical plugs



A. Understanding Electrical Plugs and related Electrical safety

B. Competencies

Main competencies:

1. Identify and mitigate potential electrical hazards in appliances and work environments.
2. Diagnose simple malfunctions in domestic appliances and safely perform basic repairs.
3. Use basic tools safely for maintenance and repairs of domestic appliances.

Sub competencies:

1. Identify risks associated with overloading sockets.
2. Follow a logical troubleshooting process (e.g., checking power supply, inspecting connections).
3. Select appropriate tools for the task (e.g., screwdriver for screws, pliers for wires).

C. Learning outcomes

By the end of this lesson students should be able to:

1. identify different types of electrical plugs (2-pin, 3-pin).
2. recognise plug types used in different countries (UK, France, USA).
3. understand the difference between plastic and metal casings.
4. explain what is double insulation and recognise its symbol.
5. know what multiplugs are and when they may be used safely.

D. Resources and materials

For demonstration by the teacher:

- Examples of 2-pin and 3-pin plugs
- Examples of appliances with plastic and metal casings (for example a hair dryer and an electric iron or rice cooker)
- Multi-plug adapter
- Printed images or diagrams of different plug types (included in this card)

E. Implementation guidelines

1. Testing prior knowledge

Show images of two typical and different plug.

(a)



(b)



To gain the interest of the students:

- Ask them if they have ever noticed the different types of plugs at home or in school.
- Show a few samples of 2-pin and 3-pin plugs. Ask them to explain how the plugs are different.
- Write key terms on the board: 2-pin plug, 3-pin plug, double insulation, metal casing, plastic casing, multi-plug.

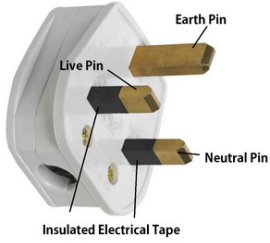
Explain to students that they will learn about these plugs, the reasons the plugs are different, and how to use them safely.

2. Introduction to plug types and standards

Activity: Spot the Difference

1. Display images of French (Norme Francaise, NF) and British Standard (BS) plugs.
2. Ask students to point out the differences (e.g., shape, size, number of pins).

3. Explain briefly that different countries use different plug designs for safety and compatibility reasons.

Plug type	Description
1. 	• 2-pin (EU) plug • No earth wire – usually safe for small appliances and those with plastic casing.
2. 	• 2-pin (US) plug • No earth wire – usually safe for small appliances and those with plastic casing.
3. 	• 3-pin UK plug • Has live, neutral, and earth pins – safer for appliances with a metal case 
4. 	• 2 (plus 1 pin in the socket) French plug • Has live and neutral pins (the earth pin is located in the socket) – safer for appliances with a metal case
5. 	• 3-pin US plug • Has live, neutral, and earth pins – safer for appliances with a metal case

3. Exploring 2-Pin vs. 3-Pin Plugs

Activity: Show and Tell

- Provide students with 2-pin and 3-pin plugs.
Let the students handle and observe them closely.
- Highlight the following:
 - » 2-pin plug
 - Has two prongs for live and neutral wires.
 - Used for appliances with plastic casings (e.g., phone chargers).
 - » 3-pin plug
 - Has an additional pin for grounding/earth wire.
 - Used for appliances with metal casings (e.g., kettles, irons).

Demonstration:

- Show an appliance with a plastic casing (e.g., a phone charger, hair dryer) and explain that it uses a 2-pin plug as it does not need grounding.



Example of appliance with 2-pin plug

- Show an appliance with a metal casing/exposed metal part (e.g., a rice cooker or an electric iron) and explain that why it needs a 3-pin plug for safety.



Example of appliance with 3-pin plug

- **Ask students the following question**

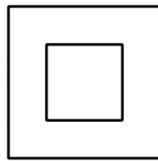
“Why do you think appliances with a metal case need a 3-pin plug?”

Answer: To prevent electric shocks if the casing becomes live (if current “leaks” to it, live wire touches the neutral wire).

4. Understanding Double Insulation

Activity: Symbol Hunt

- Show students the double insulation symbol, for example by drawing on the board.



Symbol for double insulation

- Ask students to find this symbol on their own devices or on devices around them, for example in phone chargers, laptops and a projector.



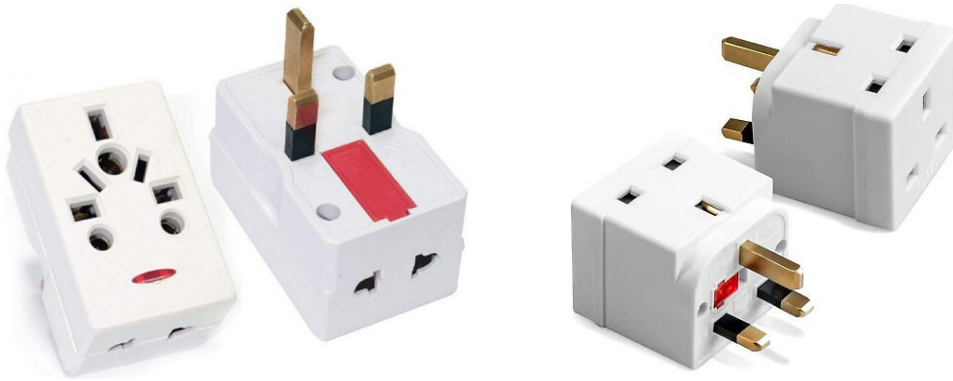
Mobile phone charger with double insulation symbol on it

- Explain that appliances with double insulation do not need a 3-pin plug because the extra layer of insulation (that is the plastic casing) protects the appliance against electric shocks.

5. Multi-Plug Adapters

Activity: Safe Use Demonstration

- Show a multi-plug adapter and explain its purpose is to connect multiple devices to one socket.



Example of different types of multi plugs

- Ask students the following question:

What will happen if too many people try to sit on a single plastic chair?

Answer: there is the risk of the plastic chair collapsing/breaking.

- ◇ Use this analogy to explain how overloading a socket by connecting too many appliances to a single multiplug can be dangerous. Reiterate why this practice is not recommended and warn them about possibility of overheating and fires.

6. Conclusion

- Recap the key points - Today we learned about:
 1. Some different types of plugs that are used around the world,
 2. Why some plugs have 2-pins and others have 3-pins
 3. How the case of an appliance affects the type of plug it should use.
 4. How multiplugs are handy but must be used carefully.

F. Assessment(in worksheet)

G. Extension activity

Ask students to go home and check the plugs of three appliances. They should note whether each has 2-pin or 3-pin and whether it has a plastic or metal casing. Bring their findings back to class for discussion.