

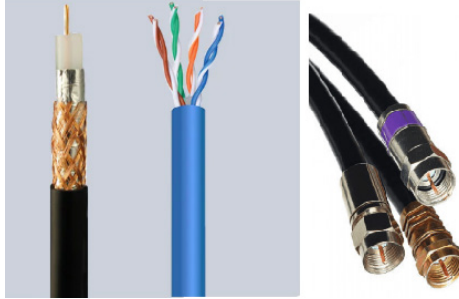
DOMESTIC APPLIANCE MAINTENANCE

Lesson 9: Teacher's guide

Types of cables



A. Safe use of different types of cables found in a household



B. Competencies

Main competency

1. Safely handle simple tools, electrical components, and potentially hazardous materials.
2. Use basic tools safely for maintenance and repairs of domestic appliances.

Sub competencies:

1. Demonstrate proper handling of basic tools (crimping tool).
2. Handle electrical components with care to avoid damage or injury.
3. Handle tools safely to avoid injury or damage to components.
4. Select appropriate tools for the task (pliers for wires).

C. Learning outcomes

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

1. the different types of cables used in a household.
2. the different parts of a coaxial cable.
3. how to install an F-connector on a co-axial cable using basic tools.
4. the difference between the male F-connector and female F-connector.
5. the different colours of wires in an RJ 45 cable.
6. how to install an RJ 45 connector/plug on a RJ 45 cable.

D. Resources and materials

Set of items for demonstration:

- a) A coaxial cable, approximately 30 to 40 cm in length, with one end already stripped.
- b) Two F-connectors (one male and one female).
- c) An RJ 45 cable, approximately 30 to 40 cm in length, with one end already stripped.
- d) One RJ 45 connector/plug.

Set of items for students working in groups of 4:

- Two coaxial cables, approximately 50 cm in length, with both ends already stripped.
- Four F-connectors male (one F-connector male per student).

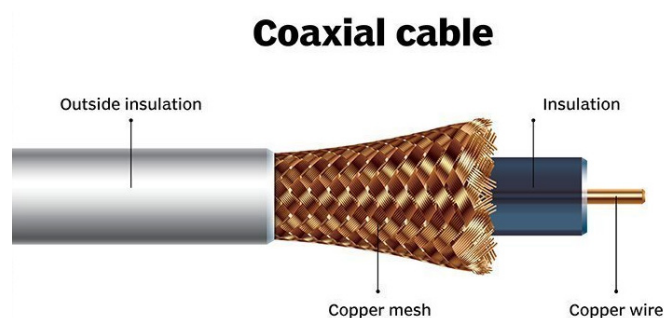
Set of items for each student for the worksheet:

- One RJ 45 cable (approximately 30 cm in length) with one end already stripped.
- One RJ 45 connector/plug.
- One RJ 45 crimper to be shared among students.

E. Implementation guidelines

Introduction

1. Begin with a brief discussion on the co-axial cable and its uses. A piece of coaxial cable (already stripped at both ends) is provided to each group of students.
 - A coaxial cable is mainly used by cable TV companies to connect their satellite antenna facilities to customer homes and businesses.



- The centre conductor layer consists of a thin (copper) wire coated with an insulating material. A shield layer, made of metal foil or braided copper (aluminium) mesh, encases the insulating material. The entire assembly is covered with an outer layer of insulating material.

2. Show the F-connectors (both male and female) to the students. Provide both F-connectors to each group.



F-connector Male



F-connector Female

- Male F-connectors are typically used to connect a coaxial cable into a female fitting or valve. The female part of the connector is referred to as the socket, which typically contains the contact sockets into which the male pins are inserted to establish the connection.
3. Show the RJ 45 cable to the students and ask them to state the colours of the various wires in the cable.
 4. Tell the students that the RJ 45 cable is used for data transfer, telephone lines, personal computers, televisions, CCTV cameras, and various other networking devices.
 - Provide two RJ 45 connectors/plugs to each group and the RJ 45 cable which has already been stripped as shown below.



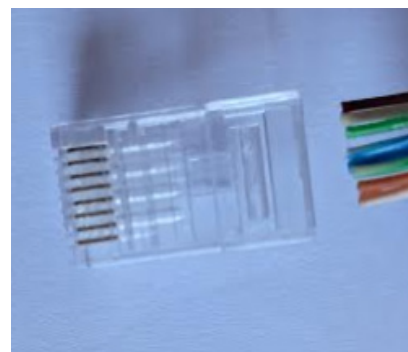
RJ 45 Cable with connectors/plugs



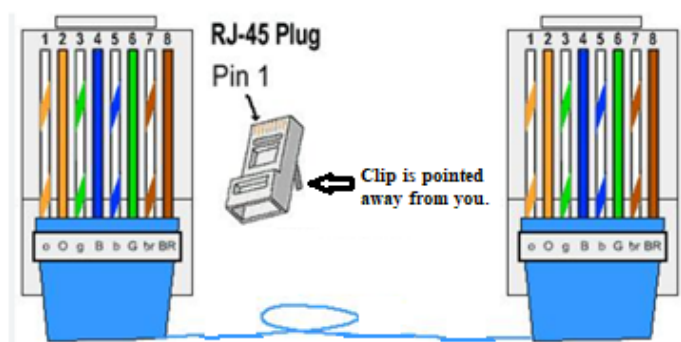
Stripped RJ 45 cable



RJ 45 Connectors/Plugs



- Show the arrangement of the various coloured wires in the RJ 45 connector/plug to the students.



- Starting on the left (with the clip facing away from you), the colours are arranged in the following order: white-orange, orange, white-green, blue, white-blue, green, white-brown, brown.

The weblink below can be used to demonstrate the procedure for fixing the RJ 45 plug on the RJ 45 cable.

<https://www.youtube.com/watch?v=NWhoJp8UQpo>

Activity: Connecting an F-connector male on a coaxial cable.

Instructions:

1. Students will work in groups of 4.
2. Provide each group with two coaxial cables, approximately 50 cm in length, with both ends already stripped. A stripped coaxial cable is shown below.



3. Provide each student with a male F-connector.
4. Each student is required to screw the F-connector male to one end of the stripped coaxial cable. Use one cable for two students, with one end for each student.

The weblink below can be used to demonstrate the procedure for fixing an F-connector on a coaxial cable.

<https://www.youtube.com/watch?v=Bn30LdXiWx4>

5. A coaxial cable fitted with a male F-connector is shown below.



Safety Aspect:

- Avoid bending or kinking the coaxial cable during installation.
- The metal foil or copper mesh in a coaxial cable should not come into contact with the thin conducting wire when connecting an F-connector.

Conclusion

Summarise the key points:

- The different parts of a coaxial cable.
- There are male and female F-connectors.
- The different coloured wires in an RJ 45 cable.
- The order of the coloured wires in an RJ 45 connector/plug.

F. Assessment (in worksheet)

G. Extension activity

Encourage students to state the other types of cables, for example, the optical fibers.

