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Unit 3: Tools and Equipment

3.1 Introduction

Various tools and equipment are used in plumbing. Developing the skills required to use those tools is fundamental. While using tools and equipment, it is necessary to be aware of certain safety measures.

3.2 Plumbing tools

Some common tools, their function and associated safety measures are described below:

a) Steel Rule (300 mm length)

Function	It is used for measuring dimensions up to 300mm.
Activity	Use a steel rule to measure a length of 200mm, 175mm and 78mm on a polypipe.
	
Safety measure	• Avoid parallax error. • Be careful with the sharp corners.

b) Measuring Tape (up to 3 meter)

Function	It is used for measuring long dimensions.
Activity	Use a measuring tape to measure a length of 1200mm, 1475mm, 2575mm on a polypipe.
	
Safety measure	• Retract the tape slowly. • Always keep your fingers clear from the edges and the end hook when retracting it. • Ensure that the locking mechanism is engaged when extending it for long measurements.

c) Permanent Marker

Function	It is used for marking.
Activity	Use a permanent marker to mark out a length of 250mm on a polypipe.
	
Safety measure	• Close the cap after use. • Avoid contact with the eyes.

d) Quick Release Pipe Cutter

Function	It is used to cut plastic pipes.
Activity	Use a quick release pipe cutter to cut a polypipe of length 250mm, 75mm, 455mm and 800mm.
	
Safety measure	• Keep your fingers away from the cutting blade. • Position the pipe firmly in the jaws of the cutter before cutting.

e) Hacksaw

Function	It is used to cut plastic pipes and other materials.
Activity	Use a hacksaw to cut a polypipe of length 250mm, 455mm and 89mm.
	
Safety measure	• Ensure that the blade is properly tightened before cutting.

f) Half Round File

Function	It is used to clean pipe edge.
Activity	Use a half round file to clean the edge of a piece of polypipe.
	
Safety measure	• Avoid applying too much pressure on the file. • Keep your fingers away from the grits of the file. • Do not use the file as a can opener.

g) Slip-joint Plier

Function	It is used to hold, tighten and loosen control system and fittings.
Activity	Use a slip-joint plier to **tighten** and **loosen** a tap in fitting.
	
Safety measure	• Adjust the plier to the correct size of control system or fitting. • Keep your fingers away from the jaws when using it.

Activity 1

Match the following tools with their respective names.

	•	• Measuring tape
	•	• Hacksaw
	•	• Slip-joint plier
	•	• Half round edge
	•	• Pipe cutter

Unit 4: Pipe, fittings and control systems

4.1 Introduction

Plumbing systems are made up of three main parts: pipes, fittings, and control systems. Pipes carry water in and out, fittings are special parts that connect pipes together or help change their direction, and control systems control the flow of water.

4.2 Polypipe

Polypipe is commonly used locally. They are readily available, cheap and easy to work with. They are black in colour with blue stripes. They exist in different diameters. In this lesson, the focus will be only on ½ inch (20mm) diameter pipe.

Characteristics of Polypipe

Black in colour with blue stripes	
Flexible	
Available in reels or required length	 
Durable and long lasting	

Corrosion resistant	 CORROSION RESISTANCE
Suitable for carrying water over long distances	 One reel of polypipe is 50 m long
Suitable for use below the ground	

Activity 1

Fill in the blanks to complete the word.

1. Polypipe is **f l e** __ __ __ __ __ .
2. Polypipe is **b** __ __ __ **k** in colour with **b** __ __ __ stripes.
3. Polypipe is suitable to be used **b** __ __ __ __ the ground.
4. Polypipe is available in both **r** __ __ __ **s** and required length.
5. Polypipe is **c** __ __ **r** __ __ __ __ **n** resistant.

4.3 Fittings

Fittings are used to allow the flow of water in different directions and to accommodate the control system. Below are some commonly used fittings.

a) Straight septor [*Septor droite* in **Kreol Morisien** (KM)]

A straight septor is used to join two lengths of polypipe of the same diameter in a straight run.

Different components of a straight septor

A straight septor consist of the following components:

Note: Graphic artist to remove watermark. Remove A, B, C and D and replace with name of component directly.

Activity 2

You are required to disassemble and assemble a straight septor in the correct order.

Activity	Use a straight septor and two pieces of polypipe to connect them in a straight run.

b) Equal tee septor [*Septor T* in KM]

Function	It is used to connect a three-branch piping system.
Activity	Use an equal tee septor to connect pieces of polypipe in a three-branch piping system.

c) Elbow septor [*Septor Coude* in KM]

Function	It is used to connect polypipe at a corner (90↰).
Activity	Use an elbow septor to connect two pieces of polypipe at a corner (90↰).

d) Polypipe female septor [*Septor Femel* in KM]

Function	It is used to connect polypipe with male threaded fitting or control system.
Activity	Connect a piece of polypipe to a female septor.

Activity 3

Complete the table below by giving the name and function of each of the fittings shown.

Photo	Name	Function
	……	Used to connect polypipe at a corner
	Equal tee septor	……
	……	……
	……	……

4.4 Control System

Control systems are devices used to control the flow and supply of water at different points. Below are some common control systems.

a) Bib tap [*Robine* in KM]

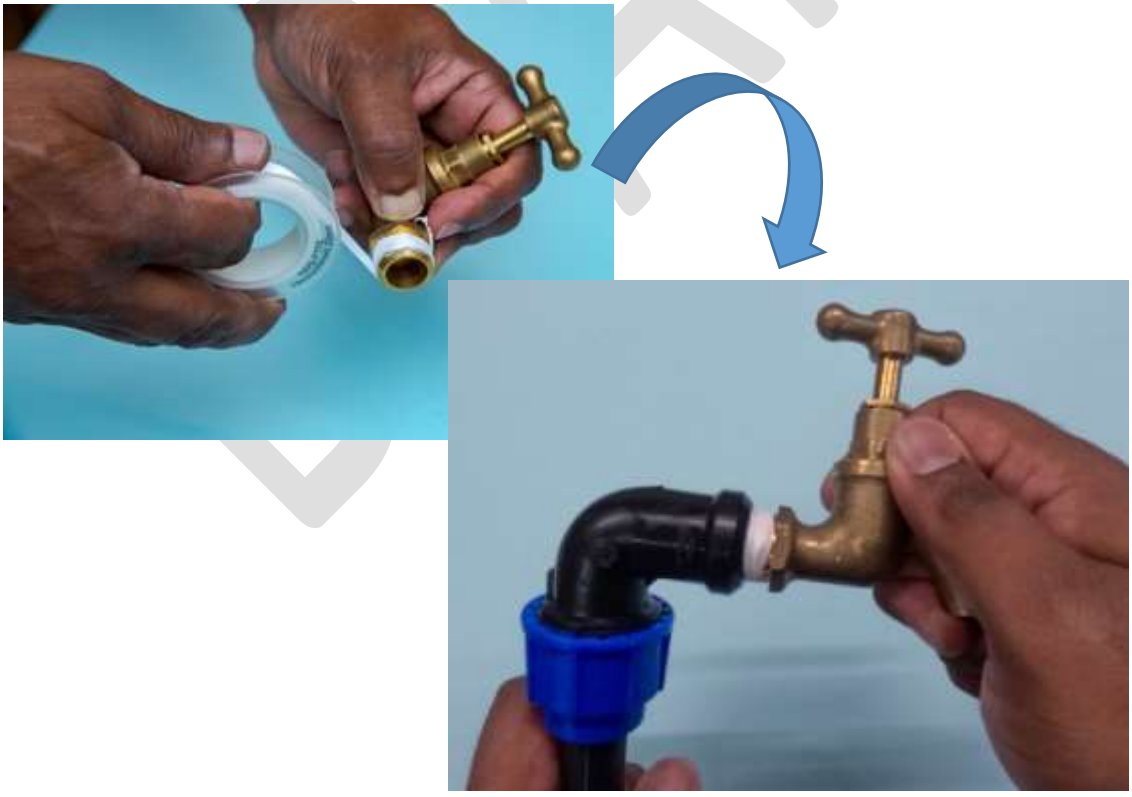
Function	Used to supply and control the flow of water at a water point.
Activity	Connect a bib tap to a polypipe female septor.

b) Garden tap [*Robine Zardin* **in KM]**

Function	It is used to supply and control the flow of water when connected to a hose.
Activity	Connect a garden tap to a polypipe female septor.

c) Winding seal tape on control systems

Function	It is used to seal any gap between fittings and the control system.
Activity	Apply seal tape to a bib tap and then connect it to a polypipe fitting.



Activity 4

Project work

You will need the following materials.

Straight septor		½ inch
Elbow septor		½ inch
Equal tee septor		½ inch
Polypipe		½ inch Length: 1 Metre

The plan of a simple plumbing system is shown in **Figure 1**. You are required to use the correct fittings and length of polypipe to realise it. Remember to observe all safety procedures and practices while carrying out this project. With the help of your teacher, you can fix it using appropriate clips on a piece of plywood. If a bib tap and a female septor is available, you can connect them at one end of the polypipe of your choice.

Wish you best of luck and enjoyment.

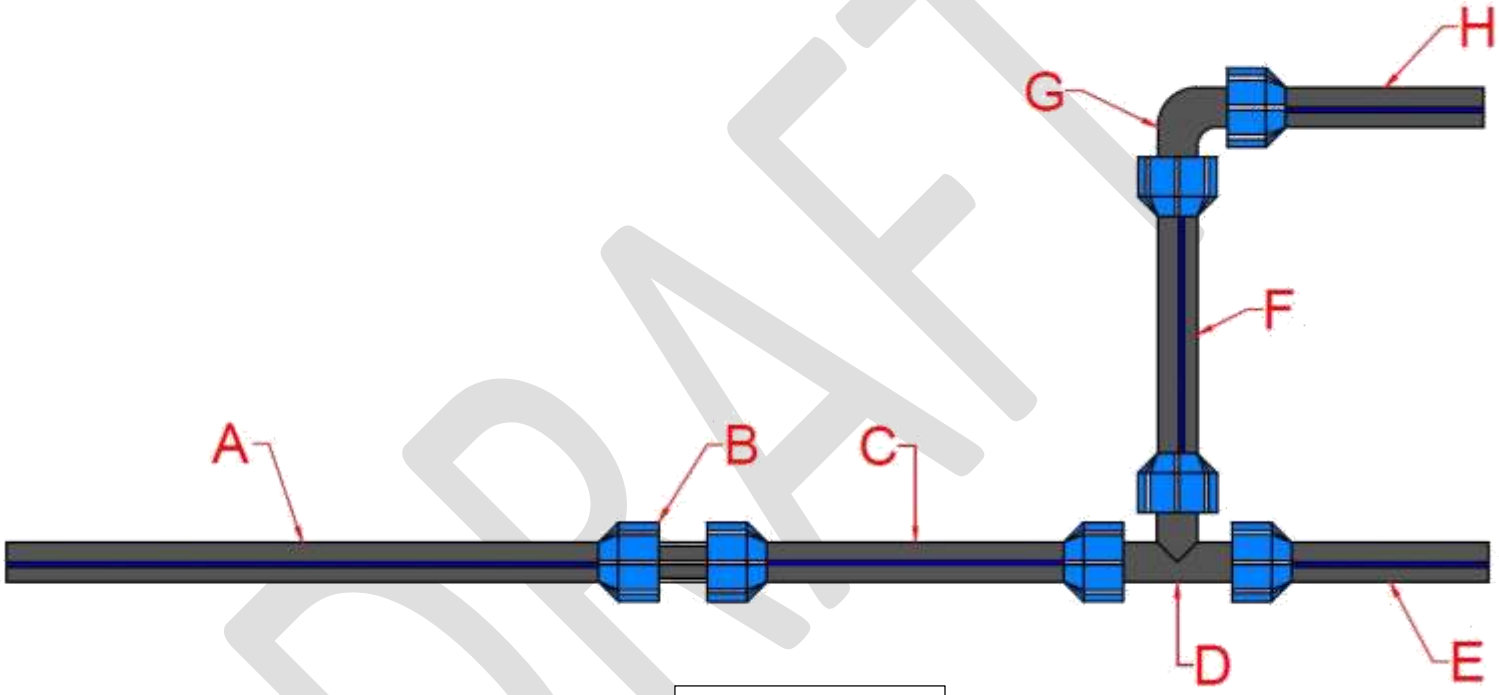


Figure 1

Part	Name	Specification
A	Polypipe	250mm
B	Straight septor	½ inch
C	Polypipe	150mm
D	Equal tee Septor	½ inch
E	Polypipe	100 mm
F	Polypipe	150mm
G	Elbow septor	½ inch
H	Polypipe	100mm

Assessment Grid for project work

	Competencies	Not achieved		Partly achieved		Fully achieved	
1	**Measuring Polypipe**	Measurements not taken or incorrect lengths used		Measurements taken but with minor errors		All lengths accurately measured as per the plan	
2	**Marking Out**	Markings not made or is not carried out at the required lengths		Markings are present but with minor errors		Markings are clearly made at correct positions for cutting and joining	
3	**Cutting Polypipe**	Cuts are uneven, rough or at wrong position		Cuts are acceptable but slightly off the mark		Cuts are clean, straight, and made at the correct marked points	
4	**Assembling fittings**	Fittings are loose, misaligned or incorrectly placed		Fittings are mostly aligned, but some are slightly loose or wrongly placed		All fittings are correctly aligned, securely fixed, and match the plan	
5	**Finishing**	Poor quality work and finishing		Work is acceptable but finishing can be improved		Work is neat, good standard, and well finished	
6	**Safety**	Unsafe practices observed and poor handling of tools/material		Some safety measures followed; minor issues noticed		Tools and materials correctly handled and all safety rules duly observed	
7	**Planning of task**	No clear sequence; unsure of steps; works randomly		Basic sequence of actions observed but lacks order or some steps missed		Clear step-by-step plan prepared and followed confidently	
8	**Time management**	Task not completed or completed very late		Task completed but took longer than expected or rushed at the end		Task completed within allocated time with steady progress	