Lifeskill Objective: Learners will be able to identify common home appliances and fixtures related to plumbing and describe common home plumbing problems.

EFF Skills: Speak So Others Can Understand, Work Together, Cooperate with Others, Convey Ideas in Writing, Listen Actively, Observe Critically, Solve Problems and Make Decisions, Take Responsibility for Learning

SCANS Skills: Resources (allocate facility and material resources)
Interpersonal (participate as a member of a team; teach others; work with individuals from a variety of ethnic, social or educational backgrounds; work and communicate with co-workers; provide basic leadership and negotiation skills)
Information (acquire and evaluate the information related to home plumbing systems; this information is then interpreted and communicated through a variety of methods)
Systems (provide basic understanding of systems)
Technology (determine the procedures and tools needed to produce the desired results)

Lesson Length: 2 hours

Tools

Realia: A small PVC pipe with a fitting attached
Small fittings or parts made of brass, PVC, cast iron and copper

Laying the Foundation: Complete Home Plumbing System--overhead; from "Part Four: Plumbing System Plan"
A small PVC pipe with a fitting attached
Pipe Fittings and Parts Handout
Understanding Pipe Fitting Name Handout

Activity #1: Pipe Fittings and Parts Handout
Understanding Pipe Fitting Names Handout
Pipe Fitting Names: Shapes and Sizes Handout

Activity #2: Pipe Fittings and Parts Drawings--cut up; multiple sets for pair activity
Pipe Fittings and Parts Handout
Activity #3:  
Pipe Fittings and Parts Handout  
Can You Hand Me A . . . ? Handout A  
Can You Hand Me A . . . ? Handout B  
Can You Hand Me A . . . ? Handout C  
Pipe Fittings and Parts Drawings--overhead; for optional review/extension activity
Target Vocabulary

Nouns:
bend coupling degree diameter elbow
fitting heel hub pipe tee
trap

Verbs:
sweep

Adjectives:
double eighth fifth P quarter
running sanitary single sixth straight
U wye (Y)
## Laying the Foundation
### Warm-Up / Presentation

### Actions

1. Ask learners to sit together in groups of four according to language level. Place several plumbing fittings as well as the PVC pipe and its fitting on the table or desk in front of the room. Put the **Complete Home Plumbing System Overhead** on the OHP.

2. Tell learners that they have already learned about the types of pipes in a plumbing system and today they will look at the many smaller parts between the pipes, called fittings. Circle the fittings between the pipes in the picture on the transparency. Write the word **fittings** on the board. Ask the group which smaller word they see in this word. Then circle the **f-i-t** in **fittings** and write the word **fit** on the board next to **fittings**.

3. Hold up and show how the parts of the plastic pipe and its fitting fit together. Tell the learners that they can remember the word **fitting** by thinking that fittings are parts that fit together. Ask learners for other examples of how we use the word **fit**, e.g., "The clothing fits/doesn't fit."

4. Still holding the PVC pipe and fitting, ask the learners what is important to know when deciding what parts or fittings to use with each pipe. As learners volunteer answers, write the possibilities on the board. You want to have (at least) the **material**, **size** and **special shape**, and **name** on the board. Make a chart on the board using these words as headings. Example:

<table>
<thead>
<tr>
<th>PIPE FITTINGS</th>
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<tbody>
<tr>
<td>MATERIAL</td>
</tr>
</tbody>
</table>

### Materials

- **Complete Home Plumbing System–Overhead**
- **Markers**
- **PVC Pipe and Fitting**
<table>
<thead>
<tr>
<th>Actions</th>
<th>Materials</th>
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<tbody>
<tr>
<td>5. <strong>If you have beginners</strong>, you may need to discuss the meanings of these words by asking for examples of each using everyday topics. For example, ask learners about the size, shape and materials of objects in the room, such as a table, the black/white board, a book or clothing.</td>
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<td>6. <strong>If the group has some plumbing experience</strong>, go back to the <strong>Materials/Sizes/Shapes/Name</strong> chart on the board. Ask the whole group what words they already know to describe plumbing fittings. If any learner can provide any words, ask them where the word fits in the chart. Ask, &quot;Is that the material, the size, or the shape name?&quot; Write that fitting word in the chart on the board under the correct category.</td>
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</table>
| 7. Give each learner the **Pipe Fittings and Parts Handout** and the **Understanding Pipe Fitting Names Handout**. Draw the first fitting type on both handouts on the board and write its name under it. Read the name of the fitting. Draw a line between the different parts of the name (**PVC/90 degree/elbow**) on the board. Say the name again, stopping after each part of the name. Have students repeat each part after you. Ask the learners to identify what the first word describes. You might ask, "Is this a size, shape or type of material?" Do the same for the other words in the fitting’s name in the order they appear. Point to the chart on the board and explain that plumbers say the complete name of the fitting in this order: **material, size, special shape, name**. Write each part of the name under the appropriate category in the chart on the board. | **Pipe Fittings and Parts Handout**  
**Understanding Pipe Fitting Names Handout**  
PVC 90 degree elbow |
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<th>Actions</th>
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<tbody>
<tr>
<td><strong>Activity #1: Understanding Pipe Fitting Names</strong></td>
<td><strong>Pipe Fittings and Parts Handout</strong></td>
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<td>1. Distribute the Understanding Pipe Fitting Names: Shapes and Sizes Handout. In their small groups, learners continue to look at the fittings on the Pipe Fittings and Parts Handout, reading the names of each fitting. Together, they decide which words in the name mean the material, the size, the special shape and, finally, the type or fitting name.</td>
<td>Understanding Pipe Fitting Names Handout</td>
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<td>Pipe Fitting Names: Shapes and Sizes Handout</td>
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<tr>
<td>2. Then, they write the parts of the name on the lines under the appropriate category on the Understanding Pipe Fitting Names Handout. Note that not each fitting has all of this information in its name. Tell the learners to fill in the entire worksheet.</td>
<td>Understanding Pipe Fitting Names Handout</td>
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<td>Pipe Fitting Names: Shapes and Sizes Handout</td>
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<td>3. Assist all groups with the pronunciation of the terms. Help beginning groups to decide under which category to write each word.</td>
<td>Understanding Pipe Fitting Names Handout</td>
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<td>Pipe Fitting Names: Shapes and Sizes Handout</td>
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<tr>
<td>4. Ask groups to stop the activity when most of the groups have filled in most of the blanks on their sheets (or they look tired of doing it).</td>
<td>Understanding Pipe Fitting Names Handout</td>
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### Actions

**Activity #2: Find It, Sort It**

In preparation for this activity, cut out the 35 (or fewer for lower levels) drawings of pipe fittings from *Pipe Fitting and Parts Drawings*. Be sure to leave the identifying number and drawing intact.

Have learners **pair up** with one of their group members from the previous activity. Give each pair a packet (envelope or plastic bag) containing the small pictures of fittings (cut apart from the *Pipe Fittings and Parts Drawings*). Learners can refer to their *Pipe Fittings and Parts Handout* to help them identify the drawings. Learners work together to sort the pictures of fittings into groups according to the categories the instructor writes on the board. For example, the instructor writes *elbows*. Each group sorts through the fittings to find all of the elbows.

When most groups have finished finding the elbows, ask them how many elbows they found. Have the group with the most fittings in that category hold up each picture and say the number of each drawing they put in that category. Check that all the fittings they have in the elbow group are correct. The group with the most correctly identified fittings in the category, in this case elbows, gets a point.

Repeat this procedure with some or all of the following categories: **tees, crosses, couplings, flanges, nuts, plugs** or **caps**.

Have one partner from each pair collect all of the fittings pictures for next activity.

### Materials

- *Pipe Fittings and Parts Drawings*
- *Pipe Fittings and Parts Handout*
Actions

Activity 3: Can You Hand Me A...?

Have learners switch partners so that each is working with a new partner from their previous group of 4. Have new pairs sort through one complete set of fitting pictures, separating them into even and odd numbered pictures. Each partner takes one set (even or odd) of the pictures. Explain that they will need to look at the Pipe Fittings and Parts Handout.

Give each learner the Can You Hand Me A...? Handout. Tell the learners that they will be having short conversations with each other, asking their partners to find a fitting and to give it to them.

Model one of the conversations from Handout A with a learner with strong speaking skills. Then have the group repeat each line of the conversations after you. You should break each sentence into natural phrases if learners cannot repeat the entire line.

Have two higher level learners model a conversation from Handout B. Ask questions such as:

- Y What does_____need?
- Y Does_____have one? Y
- How many does he have?
- Y Which one does______want?

Remind partners to ask for either an even numbered or an odd numbered fitting from the Pipe Fittings and Parts Handout, depending on what numbered fittings their partner is holding in his/her hand.

Have partners begin conversations with each other. Assist beginning learner pairs, as needed. Circulate among other groups to provide assistance.

If time permits, have partners perform conversations for the whole group.

Materials

Pipe Fittings and Parts Handout

Can You Hand Me A...? Handout A

Can You Hand Me A...? Handout B

Can You Hand Me A...? Handout C

Pipe Fittings and Parts Drawings
**Actions**

*Review or Extension Activity:*  **SWAT!**

With the transparency **Pipe Fittings and Parts Drawings** on the OHP, learner groups compete in a game to practice matching fitting name with fitting picture. After the instructor calls out a fitting type, e.g., **PVC double tee**, a member from each of the two teams comes up to overhead screen and "swats" the picture that he or she thinks matches the name. A team earns points by swatting the correct image first.

**Materials**

**Pipe Fittings and Parts Drawings– Overhead**
# Finishing Work

## Extension or Out-of-Class Practice

### Actions

1. Learners visit home building supply company (Lowe’s or Home Depot) and find the parts and fittings section. Learners list all of the part and fitting types that they see there.

2. Learners view website catalogues of major parts and fittings manufacturers and view what types of parts and fittings they make.

   - www.swagelok.com/products.htm
   - www.msi-products.com
   - www.charlottepipe.com
   - www.usplastic.com/catalog

3. Learners inspect their home plumbing to report back to the group on the types of fittings used in their home plumbing system.

### Materials

**Website Catalogs of Parts and Fittings Manufacturers**
Pipe Fittings and Parts

1. PVC 90° elbow
2. PVC 1/4 bend
3. PVC threaded coupling
4. CPVC tee
5. PVC double tee
6. PVC cross
7. PVC bushing
8. PVC union
9. CPVC male adapter
10. PVC clean out
11. ABS closet flange
12. ABS cap
13. ABS p-trap
14. ABS wye
15. Brass coupling
16. Brass cross
17. Brass floor flange
18. Brass bushing
black iron floor flange  
black iron hex bushing  
cast iron clean out  

chrome p-trap
<table>
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<tr>
<th>Material</th>
<th>Size or Special Shape</th>
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<td>90 degree</td>
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Understanding Pipe Fittings: Shapes and Sizes

Angles and Fractions

When a fitting has an angle or curve in it, its name will have a degree (°) or a fraction (¼) in it. The degree or fraction describes how big the curve is in the fitting.

Degrees of Angles or Curves

- 90 degree angle (90° angle)
- 45 degree angle (45° angle)
- 22 ½ degree angle (22 ½° angle)

Fractions

- 1/4 bend (one quarter bend)
- 1/8 bend (one eighth bend)
- 1/16 bend (one sixteenth bend)

Color 1/4 of the circle.
Color 1/8 of the circle.
Color 1/16 of the circle.
Activity #3: Can You Hand Me A . . . ?

Handout A

Conversation #1

A: Hey,__________________

B: Yeah? What do you need?

A: Can you **hand** me a 90° elbow?

B: Sure. Just a minute. (looks for fitting)
   Here you go. (gives fitting to partner)

A: Thanks a lot.

B: You’re welcome.

Conversation #2

A: Maria?

B: Yes. What is it?

A: Can you **get** me a floor flange?

B: Let me see. (looks for fitting and gives it to his/her partner)
   Here it is.

A: Thanks a lot.

B: No problem.
Activity #3: Can You Hand Me A . . . ?

Handout B

Conversation #1

A: Hey, ____________,
B: Yeah? What do you need?
A: Can you **hand** me a 2 ½ inch tee?
B: Sure. Just a minute. (looks for fitting)
    I only found one. (gives fitting to partner)
A: That’s all I need.
B: Here you go. Do you need anything else?

Conversation #2

A: Maria?
B: Yes. What is it?
A: Can you **give** me a few locknuts?
B: How many?
A: Three or four will be enough.
B: Ok, let me look. (looks for fitting and
gives it to partner)
    I found some. Hold out your hand.
A: I got them. Thanks a lot.
B: No problem.
Activity #3: Can You Hand Me A . . . ?

Handout C

Conversation #1

A: Hey, _______________,
B: Yeah? What do you need?
A: Can you get me a 1/8 bend from the truck?
B: Let me see if we have any. I'll be right back. (looks for fitting in truck)
   I'm back. Okay, do you want the 3-inch or the
   3 1/2 inch 1/8 bend?
A: I'll take the 3-inch one.
B: Can you get it? (Can you reach it?)
A: Got it. I appreciate it.
B: Let me know if you need anything else.
A: Thanks.
B: You’re welcome.

Conversation #2

A: __________? Are you there?
B: Yes. What can I do for you?
A: Can you get me a copper double wye?
B: I'll look. Is it in the van?
A: I'm not sure.
B: Ok, let me look. (looks for fitting and show something to his/her
   partner)
   I found a PVC double wye, but I didn’t see a copper one.
A: Okay. I'll need to go back to the shop.
B: I'll go get it for you.
A: Thanks, and bring me back a coke, too.
B: You owe me.
90 degree elbow (or bend)  
45 degree elbow  
reducing tee  

cross  
90 degree reducing elbow  
union  
flange  
90 degree reducing elbow  
tee  
locknut  
cap  
square head plug  
hex bushing  
cap  
nut
coupling female connector female union
male connector 90 degree male elbow union
45 degree male elbow tee union elbow
branch tee reducing coupling cap
branch tee 90 degree male elbow cross
branch tee 90 degree male elbow cross
face bushing

hex nipple

hex coupling

male run tee

45 degree street elbow