Building Plan / Blue Prints / Specs (Getting Ready to Teach)

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


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: Pipe segments of different materials--PVC, copper, cast iron, ABS

Activity #1: Whiteboard or Flipchart Paper and Markers
Complete Home Plumbing System--overhead
Complete Home Plumbing System Handout

Activity #2: Colored Pencils--set of 5 colored pencils for each group of 3 learners
Dry Erase Markers--same 5 colors as colored pencils
Complete Home Plumbing System--overhead
Complete Home Plumbing System Handout--one for each learner, plus extra copies for second tries

Activity #3: Listening and Reading Practice Handout A--Student #1
Listening and Reading Practice Handout A--Student #2
Listening and Reading Practice Handout B--Student #2
Listening and Reading Practice Handout B--Student #2
Target Vocabulary

Nouns:

brass  cast iron  drain and waste  fractions (¾, ½)  galvanized iron

gas    main     pipe     plastic (PVC, CVPC, ABS)

secondary  sewer  stack  supply system  vent
Laying the Foundation

Warm-Up / Presentation

<table>
<thead>
<tr>
<th>Actions</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity 1: Understanding Pipe Lines</strong></td>
<td><strong>Whiteboard or Flipchart Paper</strong></td>
</tr>
<tr>
<td>1. In preparation for the class, draw a large chart on the board like</td>
<td><strong>Markers</strong></td>
</tr>
<tr>
<td>the one below. Be sure to follow the space allotment that you see on</td>
<td></td>
</tr>
<tr>
<td>the sample chart for each cell.</td>
<td></td>
</tr>
<tr>
<td>Example chart:</td>
<td></td>
</tr>
<tr>
<td><strong>Pipe Lines in a Plumbing System</strong></td>
<td></td>
</tr>
<tr>
<td>What are they called?</td>
<td>What do they do?</td>
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<td></td>
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</tbody>
</table>

2. Distribute the A Complete Home Plumbing System Handout to every learner. Place the Overhead on the OHP and explain that, in this lesson, we will be learning about the complete plumbing system in a home. Explain that every building has three different pipe lines to do three different jobs.

A Complete Home Plumbing System Overhead

A Complete Home Plumbing System Handout

3. Elicit from learners what (jobs) the plumbing pipes do in a house.

Ask:
Actions

What do the plumbing pipes do in a house?
What kinds of jobs do these pipes do?
How do they make our lives more convenient or comfortable?

Write any correct words learners contribute in the empty space on the Overhead or on the board (not in the chart). Some possible vocabulary: carry, bring, take out, take away, remove, flow, move, go up/down, hot/cold water, gas, waste, drain.

Materials

A Complete Home Plumbing System–Overhead
A Complete Home Plumbing System Handout

4. Tell the group that plumbers need to understand what three pipe lines do and how they are connected in the house.

5. In the left column of the chart on the board, in the rows below Pipe Lines write: Supply Lines, Drain & Waste, and Vent.

Tell the learners that plumbers work with these three pipe lines. Say each term and have learners repeat after you.

Pipe Lines in A Complete Home Plumbing System

<table>
<thead>
<tr>
<th>What are they called?</th>
<th>What do they do?</th>
<th>What do they carry?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Pipes</td>
<td>bring</td>
<td>clean, hot water</td>
</tr>
<tr>
<td></td>
<td>bring</td>
<td>clean, cold water</td>
</tr>
<tr>
<td>Drain &amp; Waste Pipes</td>
<td>remove, take away, take out</td>
<td>used water, “gray water”, toilet waste</td>
</tr>
<tr>
<td>Vent Pipes</td>
<td>remove, give off, take away, take out</td>
<td>gas, sewer gas</td>
</tr>
</tbody>
</table>

Actions

6. Looking at the list of words (on the board) that learners contributed, ask which ones mean the same thing as the first pipe line, Supply. After giving the learners an opportunity to suggest words, write the words bring and carry in the next column to the right.

Then, ask which words mean the same as Drain, the first word in the next type of pipe line. Write any of the verbs remove, take away, take out in the column next to Drain and Waste. Follow the same procedure for the Vent pipe lines, and write any of the verbs remove, give off, take away, take out in the second column next to Vent Pipes.

Materials

Whiteboard or Flipchart Paper
Markers
7. Next, ask the learners what each of these pipe lines carries. You can also use the verbs in the second column to elicit this information. For supply, you can ask:

- What do the supply lines carry?
- What do they bring into the house?

Write any correct answers in the appropriate rows in third column of the chart. Do the same for all three pipe lines.

<table>
<thead>
<tr>
<th>Whiteboard or Flipchart Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markers</td>
</tr>
</tbody>
</table>

8. Pointing to the different columns in the chart, review that we know what the 3 pipe lines are called, what they do and what they carry. You can have volunteers restate these points or state each point and have learners repeat after you. Another option would be to say several statements about the three pipe lines and have the group tell you if each statement is true or false. If the statement is false, ask a volunteer to say a correct statement about that aspect of the pipe lines.

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<td>Markers</td>
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</table>

9. Ask learners what else plumbers need to know about the pipe system in a house. Write several statements elicited from the learners. Pick out or introduce the topics of location, placement or connections of the pipes and tell the learners that we will next talk about where the pipes go.

10. Invite learners to work with one or two others (at any language level) sitting in the same area for this next part of the lesson. Distribute one set of colored pencils in the four colors to each small group. (See the sample chart in *Activity #2*.)

<table>
<thead>
<tr>
<th>Colored Pencils</th>
</tr>
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</table>
## Actions

### Activity #2:  Map It

1. Ask for four volunteers to come up to the OHP and trace where each pipe line goes in the house picture, starting with the cold water supply pipes. Have each volunteer carefully color in a system's pipe lines on the transparency with dry erase markers, using the colors listed below. Write this chart on the board. Explain that this is the key to the graphic. A key shows us how to understand where each pipe line goes.

### Complete Plumbing System Illustration

#### Pipe Lines

<table>
<thead>
<tr>
<th>KEY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold water supply lines</td>
<td>BLUE</td>
</tr>
<tr>
<td>Hot water supply lines</td>
<td>RED</td>
</tr>
<tr>
<td>Drain and Waste lines</td>
<td>GRAY (or black)</td>
</tr>
<tr>
<td>Vent lines</td>
<td>YELLOW</td>
</tr>
<tr>
<td>Gas lines</td>
<td>GREEN</td>
</tr>
</tbody>
</table>

2. While the volunteers are each coloring in the pipe lines on the overhead, have the rest of the learners color in and label the different pipe lines on their own **Complete Plumbing System Handout**, using the colored pencils provided.

3. Have the learners in each group check the colored lines in their members' illustrations for accuracy.

4. An extension of this activity would be to have each member in a group explain the path of one of the pipe lines to the others. On the board, write:

```
The ______________________ lines start at the _____________
and go to the_____________. From the______________,
the lines run to the______________.

Beginners can copy this sentence and add the words for one of the pipe systems to complete it.
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### Actions

**Activity #3: Reading and Listening Practice**

Pair learners with a partner of like language ability. Distribute a copy of the **Student #1** and **Student #2** versions of the **Listening and Reading Practice Handout** to each pair.

**Handout A** is for beginners and **Handout B** is for mid- to higher level learners.

Each pair has two short readings. The partners will take turns reading a text while the other fills in the blanks on his/her **Handout** with the missing words. After one partner has written all of the missing words in his/her paragraphs, the other partner reviews the answers using the complete text.

Pairs can practice reading the paragraphs to each other.

Circulate among pairs to assist learners with pronunciation and vocabulary.

### Materials

**Listening and Reading Practice Handout A**— **Student #1**

**Listening and Reading Practice Handout A**— **Student #2**

**Listening and Reading Practice Handout B**— **Student #1**

**Listening and Reading Practice Handout B**— **Student #2**
Finishing Work
Extension or Out-of-Class Practice

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<tr>
<td>1. Learners identify the path of the different pipe lines (starting with the mains) in their home’s plumbing system. They can also look for the diameter size and materials used in the different lines.</td>
<td></td>
</tr>
<tr>
<td>2. Learners attend a workshop session at a home, installing or repairing pipes in any of their home pipe lines.</td>
<td></td>
</tr>
<tr>
<td>3. Learners inspect all the pipe lines to their appliances for their condition and locate the water meter, basement floor drains and (outside) the sewer cleanout.</td>
<td></td>
</tr>
<tr>
<td>4. Learners visit a home improvement store to look at the pipes and pipe installation products available for the three different pipe lines.</td>
<td></td>
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</table>
Plumbing
Lesson Four: Plumbing System Plan

Facilitator Materials

Building Basics was paid for under an EL Civics grant from the U. S. Department of Education administered by the Virginia Department of Education. It was paid for under the Adult Education and Family Literacy Act of 1998; however, the opinions expressed herein do not necessarily represent the position or policy of the U. S. Department of Education, and no official endorsement by the U. S. Department of Education should be inferred. This document was designed and created by the Virginia Adult Learning Resource Center at Virginia Commonwealth University, 817 West Franklin Street, Suite 221, P.O. Box 842037, Richmond, VA 23284-2020. It may be reproduced for nonprofit, educational purposes only.
Activity #3: Reading and Listening Practice

**Handout A**  
**Listening Practice: Student #1**

Listen as your partner reads this paragraph about the pipes in a plumbing system. Then, write in the words that you hear. You can use this list of words to help you. All of these words explain the location of something.

<table>
<thead>
<tr>
<th>at</th>
<th>through</th>
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**Reading Practice: Student #2**

Read these two paragraphs to your partner. Stop after each sentence for a few seconds. Read it again. When your partner has understood all of the missing words, check the answers.

In the drain and waste (DW) system, waste from the appliances and fixtures is carried down the branch drains to the main house drain. From the main drain, the waste flows out of the house and into the soil pipe. Drain pipes below the basement also carry waste water to the soil pipe. The soil pipe runs under the house to the sewer. The vent pipes carry sewer gas up the main vent stack. The gas is removed from the house through a pipe opening in the roof.
Activity #3: Reading and Listening Practice

Handout A  🗣️  Listening Practice: Student #2

Listen as your partner reads these two paragraphs about the pipes in a plumbing system. Then write in the words that you hear. You can use this list of words to help you. All of these words explain the location of something.

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Reading Practice: Student #1

Read this paragraph to your partner. Stop after each sentence for a few seconds. Read the paragraph again. When your partner has understood all of the missing words, check the answers.

The cold water main comes into the house from the water supply lines buried under the ground. The cold water main leads to the hot water heater. The cold water branches take the water from the main to all of the fixtures and appliances in the house that use water.

The hot water main starts at the hot water heater. The main carries hot water to the fixtures and appliances through its branches. It almost always runs next to the cold water main. Plumbers usually don’t install gas pipes, but they need to be careful when working around the gas lines.
Activity #3: Reading and Listening Practice

Handout B  🎨 🎨 Listening Practice: Student #1

Listen as your partner reads these three paragraphs about the pipes in a plumbing system. Then, write in the words that you hear.

Reading Practice: Student #2

Read these three paragraphs to your partner. Stop after each sentence for a few seconds. Read the paragraph again. When your partner has understood all of the missing words, check the answers.

Plumbing pipes come in different sizes and materials. Plumbers need to know three things before they decide which pipe is best. The first thing they must know is the temperature of the substance that will flow through the pipe. PVC pipe can only be used in pipe lines that carry cold or warm water. Galvanized iron, PB, CPVC, and copper pipe can carry both hot and cold water.

The second thing a plumber needs to know is the volume of the water or waste that will run through the pipe. Volume means how much of the contents will pass through the pipe at one time. Hot and cold water supply mains are usually 3/4 " and their branches are 1/2". The vent system has a main vent stack of pipe 3 or 4 inches in diameter. The main vent stack connects to 1 1/2 - 2 inch branch vent pipes.

The last thing that is important to know is where the pipe will be installed. The types of pipe used in the drain and waste system are also used in the vent system. These types of pipes have the letters, DWV, on the outside of the pipe. Today, the most common DWV pipes are made of cast iron, copper tubing and plastic (ABS, PVC, and PE).
Activity #3: Reading and Listening Practice

Handout B  

Listening Practice: Student #2

Listen as your partner reads these two paragraphs about the pipes in a plumbing system. Then, write in the words that you hear.

Reading Practice: Student #1

Read these two paragraphs to your partner. Stop after each sentence for a few seconds. Read it again. When your partner has understood all of the missing words, check the answers.

The cold water main comes into the house from the water supply lines buried under the ground. The cold water main leads to the hot water heater. The cold water branches take the water from the main to all of the fixtures and appliances in the house that use water.

The hot water main starts at the hot water heater. The main carries hot water to the fixtures and appliances through its branches. It almost always runs next to the cold water main. In the drain and waste (DW) system, waste from the appliances and fixtures is carried down the branch drains to the main house drain. From the main drain, the waste flows out of the house and into the soil pipe. Drain pipes below the basement also carry waste water to the soil pipe. The soil pipe runs under the house to the sewer. The vent pipes carry sewer gas up the main vent stack. The gas is removed from the house by a vent pipe that runs through an opening in the roof.