

MASS CLEAN ENERGY CENTER **AUTHENTIC MATERIAL ACTIVITY · TROUBLESHOOTING A MYSTERY HVAC UNIT**

Troubleshooting a Mystery HVAC Unit

Contextualized ESOL Support Activity

ACTIVITYCritical Thinking,
Problem-Solving**45-60**
minutes

TROUBLESHOOTING A MYSTERY HVAC UNIT

ACTIVITY OVERVIEW

Objective	Students will learn the process for troubleshooting an HVAC unit that they are not familiar with.
Durable Skill	Critical Thinking, Problem-Solving
When to Use	This is best for students who already have practiced troubleshooting more common HVAC units as the video demonstrates a seasoned technician who is troubleshooting an HVAC unit he has never seen before. For longer training programs, this activity could be expanded and used as a capstone project.
Student Interacts With Hypothetical	Supervisor
Activity Type	Video discussion
Time Needed	45-60 minutes

STUDENT MATERIALS

- Handout 1: Authentic Materials - Vocabulary Definitions
- Handout 2: Questions for Video Watching

Instructor Preparation**Activity Location**

- Classroom with video capability

Material Preparation

- Review the student handouts.
- Best Practice
 - Identify any key vocabulary terms from Handout 1: Authentic Materials - Vocabulary Definitions that students should be referencing as part of the activity. Be prepared to reference these during the activity.
- Review the video, [Troubleshooting a Mystery HVAC Unit with Roman Baugh](#) (17:29 min.) HVAC School.
- When showing the video, be sure to use closed captions and slow the speed for multilingual learners. In class, consider slowing down the video or giving time markers when to stop the video to let students write their answers. Consider providing the video to students ahead of time to preview.
- For background information, you can review:
 - Amatrol Module 12, Heat Pump Component Tests
 - Amatrol Module 14, Troubleshooting Residential Heat Pump Systems
 - Amatrol Module 19, Mini-Split Heat Pump Component Tests
 - Amatrol Module 20, Troubleshooting Residential Mini-Split Heat Pump Systems

ACTIVITY DIRECTIONS

1. Tell students that whether they are a new or an experienced service technician, troubleshooting unfamiliar equipment is one of the most valuable skills they can develop.
2. Note that they have practiced troubleshooting HVAC equipment that they are familiar with. Now they will draw on that experience to identify key questions they would ask if they were called out to a job to troubleshoot a unit they have never seen before.
3. Ask students to turn to the person next to them and brainstorm a list of three to four questions they would ask if they were called out to a job site to troubleshoot a unit they have never seen before. Allow three to five minutes.
4. Next, ask each pair to name one of their questions. Record on a whiteboard or screen with each pair adding a new question. Debrief by stating that troubleshooting a unit they are unfamiliar with requires the ability to assess information, identify patterns, and make well-reasoned decisions. It also takes creative thinking.
5. Explain that they are now going to watch the video, [Troubleshooting a Mystery HVAC Unit with Roman Baugh](#). Distribute and review Handout 2: Questions for Video Watching. Tell them to answer the questions as they watch the video.
 - Show the video. (Note: To support multilingual students, be sure to show closed captions. Consider slowing down the video or giving time markers when to stop the video to let students

write their answers. Also, consider providing the video ahead of time allowing multilingual students to preview it.)

6. Before reviewing their answers on Handout 2, ask these broader questions:
 - What were you most surprised by?
 - What did not make sense to you?
 - What other questions might you have asked if you are troubleshooting this HVAC unit? What would it have told you?
7. Once the group has discussed the broader questions, review their answers to the questions on the handout.
8. Reiterate that troubleshooting unfamiliar equipment is one of the most valuable skills they can develop as a service technician. Having curiosity and knowing how to think analytically will help them to remain calm and clear when servicing a customer and when discussing a problem with their supervisor.

ESOL Strategy Note

Before the brainstorm in step 3, write a sentence frame on the board such as “If I were on this job, I would ask...” so multilingual learners have a ready structure for generating their own troubleshooting questions rather than having to build both the grammar and the technical content from scratch.

Before showing the video in step 5, preview a few of the technical terms students will hear on Handout 2 (e.g., “condenser fan,” “voltage,” “pressure and temperature”) so students can focus on following Roman Baugh’s troubleshooting process rather than decoding new vocabulary in real time.