

13. Architecture and Construction Cluster - Maintenance Careers (4 hours)

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| Purpose/Abstract: To introduce students to the various maintenance careers within the architecture and construction cluster. | | | |
| NCCCS Adult Education Standards: R.3.1.2, W.5.1.3, M.2.1.2 | | | |
| Learning Objective: By the end of the session, students will be able to: <ul style="list-style-type: none"> ● Outline maintenance careers available in our area ● Describe different types of maintenance and respective work environments ● List steps to complete a simple maintenance project | | | |
| Soft Skills | professionalism | Resources | <p>Skills to Pay the Bills (STPTB) (for instructor reference to define each soft skill category)</p> <p>Architecture & Construction Career Cluster (links used in this lesson are taken from this webpage)</p> <p>Math games and worksheets used in the lesson:</p> <ul style="list-style-type: none"> ● Centimeters and Inches ● Common Units of Measurement (this is for students' reference) ● Choose the unit ● Measurement and Capacity ● Measurement and Weight <p>Customized career information for the group activity:</p> <ul style="list-style-type: none"> ● Electrical Power-Line Installers and Repairers ● Mechanical Door Repairers ● Highway Maintenance Workers <p>NC Career Clusters Guide(for instructor reference)</p> <p>Handouts:</p> <ul style="list-style-type: none"> ● Reading and Vocabulary - 1 for each student ● Maintenance tasks steps - 1 for each student |
| Additional Materials <ul style="list-style-type: none"> ● Reading and Vocabulary handout, one for each student ● Maintenance tasks steps, one for each student ● Poster paper/ Large white paper for each group ● Art supplies (glue, glitter, markers, etc.) ● Pencils, paper ● Computers for student use | | | |
| Icons |  Activity |  Check-In |  Review |

PREPARATION

- Review the worksheets and games on [Education.com](#) and print out the following worksheets:
 - [Centimeters and Inches](#)
 - [Common Units of Measurement](#) (this is for students' reference)
 - [Choose the unit](#)
 - [Measurement and Capacity](#)
 - [Measurement and Weight](#)
- Review the [Instructional Support Guide](#) and print/prepare referenced scaffolds.
- Print handouts.
- Familiarize yourself with the careers in focus for this lesson.
- Familiarize yourself with the [OneStop Career Clusters](#).
- Familiarize yourself with [O*NET](#)
- Familiarize yourself with [Skills to Pay the Bills](#), though it won't be used directly in this lesson.

INTRODUCTION (30 min)

Welcome students to the class!

Conduct a quick icebreaker activity to get students ready for class. Consider this variation of Simon Says!

- Choose one person to be the leader (Simon), and the rest of the participants will be the followers.
- Instruct the participants to listen carefully to the leader's commands and only follow the commands that start with "Simon says. " For example, "Simon says touch your nose" or "Simon says jump up and down."
- The leader (Simon) will give a series of commands, mixing those with and without "Simon says."
- The followers should only perform the actions when the command is preceded by "Simon says." If the leader gives a command without saying "Simon says," the followers should not perform the action.
- If a participant accidentally performs an action without "Simon says" or fails to perform an action when "Simon says" is included, they are out of the game.
- Continue playing until there is one participant remaining or for a specified duration.

Thank the students for their participation and bring them back together for the lesson.

Tell students that the lesson will focus on careers in the maintenance and operations pathway within the architecture and construction cluster. Explain that maintenance/operations professionals keep buildings and structures in good working order. They make sure structures are safe, meet government codes, and provide comfort for users. Jobs in this field include electricians, elevator installers and repairers, floor covering installers, heating and cooling technicians, and janitors and cleaners.

Ask students to turn to the person next to them. Give them 10 minutes to list all the times they or their families have relied on maintenance professionals for their services. Encourage them to think about instances such as fixing electrical issues, repairing appliances, providing cleaning services, or any other maintenance-related tasks. After 10 minutes, ask a few volunteers to share their experiences with the whole class.

Share the lesson objectives and explain how they will be covered in the lesson.

VOCABULARY, READING, and WRITING (60 min)

Let students know that in this activity they will practice their reading comprehension, vocabulary and writing skills. Remind them that they will also use this time to reflect on the importance of professionalism in maintenance careers.

Distribute the reading and vocabulary handout to each student.
Partner students up for this activity. Provide each pair with a dictionary.

Tell students that each passage in the handout contains a summary of a career within the maintenance and operations pathway under the architecture and construction cluster. Instruct pairs to read through each passage and answer the questions given below. Ask students to **underline words** that are new to them in each passage and look up their definitions.

Before students begin work on the activity, ask them to summarize what they understand about sequencing in a text. Have 1-2 students share examples. If students are not clear, provide a simple example to explain the concept of sequencing, indicating how they can look for phrases that help them find the sequence of activities such as 'first', 'then', 'next', etc.

Ask 1-2 volunteers to explain what they understand by professionalism and explain it with a simple example. Add to the students' answers with context specific examples of how it is an important skill while performing maintenance activities.

Allow 45 minutes for this activity. Walk around, observe the progress made by each pair, and offer support as required.

REFLECTION (15 minutes)

- ✓ Ask 2-3 pairs to read out their written responses for each passage.

Have 1-2 students share a few vocabulary words they found definitions for.

Guide a short discussion on how sequencing is applied across a variety of texts (recipes, instructions, informational texts, plots, etc.) and how making predictions about the text will help them engage with the text better as a reader.

Lower Level

Consider pairing students up with a higher level student.

Higher Level

Challenge students to reflect on how these careers impact their lives and write a short paragraph on their reflection.

Instructor notes: These texts are at a grade 3 reading level but if you feel students might need support, consider doing a whole class read-aloud for the passages and provide time after each to answer the questions.

MATHEMATICS (45 min)

Review the concept of indirect measurement from the previous lesson. Ask 2-3 students to share examples of measurements they took.

Explain that when objects are measured, different units can be used, and depending on the unit used, the answer will change. Provide the following example to explain, *When we measure things, like how tall someone is, we use different units like inches or feet. Depending on what unit we use, the answer will be different. For example, if we measure someone's height in inches, it will be a smaller number than if we measure it in feet. It's important to be clear on what units are used for measurements to avoid confusion. For instance, if you measured your own height in inches and purchased a mattress of the same length in feet, the mattress would be too short, and you wouldn't be able to sleep comfortably. So always make sure to use the same units when measuring things and buying things like mattresses.*

Tell students that they will measure a few objects twice using two different units, centimeters and inches, and note down the values in their notebooks. You can use this [worksheet](#) as a reference. Demonstrate by using a ruler to measure the side of a notebook in centimeters and the same side again in inches. Note down both values in tabular form on the board, and ask students to share what they notice about the values.

Allow 10 minutes for students to measure at least three objects around the classroom in centimeters and inches. Encourage them to note the values down in tabular form similar to the one on the board.

Ask the following questions and guide a discussion around using the correct unit for measurements.

- *You want to measure the distance between your house and your friend's house. Would you use inches or miles? Why?*
- *If you want to measure your doors to buy new curtains, would you use feet or yards? Why?*

Distribute the following worksheets on common units of measurement and comparing/converting units.

- [Common Units of Measurement](#) (this is for students' reference)
- [Choose the unit](#)

Tell students to use the first worksheet as a reference while completing the second worksheet.

Offer guidance and support as needed.

Conduct a class discussion to review the answers and provide explanations for any challenging concepts.

REFLECTION (10 minutes)

- ✓ Collect and review the students' work to assess their understanding of the concept.

Facilitate a short discussion on how accurate measurements are important while working on maintenance tasks and share a few real life examples.

Lower Level

Higher Level

Provide additional time to practice measuring objects using different units.

Challenge students with these games of different units of measurements

- [Measurement and Capacity](#)
- [Measurement and Weight](#)

GROUP WORK (60 min)

Divide the class into six groups, ensuring a mix of lower and higher level students. Provide each group with a large piece of paper and art supplies. Assign two groups to each of the three linked careers from the list below.

Explain to students that they will work together as a group to create an informational poster on the maintenance/operation career assigned to them. Tell them that the links you share will have a summary of activities and the work context for the career.

Instruct the groups to research and discuss their assigned careers. Encourage the groups to create a visual representation showcasing work activities and thinking about the work environments associated with them.

Share the following links:

- [Electrical Power-Line Installers and Repairers](#)
- [Mechanical Door Repairers](#)
- [Highway Maintenance Workers](#)

Allow 30 minutes for this activity.

 REFLECTION (30 minutes)

✓ Ask each group to present their visual representation to the rest of the class

Facilitate a class discussion, summarizing the different careers, activities, and work environments explored by each group, and highlighting the commonalities and differences across the presentations. Encourage students to discuss how professionalism is important in each of these careers.

Wrap up this section by informing students that this is just a few of the careers in the maintenance and operations pathway under the architecture and construction cluster

| Lower Level | Higher Level |
|---|---|
| Offer support to help students visualize what the various work environments will look like for each career. Provide examples to guide their thinking. | Encourage students to independently research these careers to understand the technology, skills, and training required. |

PARTNER WORK TIME (45 min)



Distribute the Maintenance Task Steps handout to each student.

Explain to the students that they will be working independently to list the steps required to complete a simple maintenance project.

Start by discussing and providing examples of simple maintenance projects (e.g., changing a light bulb, unclogging a sink, or fixing a loose doorknob).

Encourage the students to think through the process step by step, considering safety precautions and any necessary tools or materials.

Allow the students to work independently for approximately 30 minutes, checking in periodically to offer support, clarify instructions, and simplify explanations for lower order learners.

 REFLECTION (10 minutes)

Invite the students to share their lists with a partner or in small groups, discussing similarities and differences in their approaches.

Facilitate a class discussion, allowing each student to contribute their ideas and summarizing the essential steps needed to complete a simple maintenance project.

Conclude the activity by emphasizing the importance of following a systematic approach to maintenance projects and the value of independence and problem-solving skills in accomplishing such tasks.

| Lower Level | Higher Level |
|---|---|
| Allow students to illustrate the steps instead of writing them out. | Challenge students to think of one or two other maintenance tasks and write out the steps to complete them. |

Instructor notes: Depending on the time taken by students to write out the steps, you can choose to assign either one maintenance task or two for this activity.

WRAP-UP & REFLECTION (15 min)

Ask 2-3 volunteers to share what they learned in this lesson.

Distribute exit slips to students.

Ask for a few volunteers to share their reflections.

Collect and review the answers.

Reading and Vocabulary

Name: _____

Date: _____

Directions:

- There are three passages for this activity.
- Read each passage with your partner.
- Discuss and answer the questions below each passage. Write your answers in the space provided.
- Ask your instructor for help if you need it.

Passage 1 - Maintenance Career: HVAC Technician

HVAC technicians are experts who install, fix, and take care of heating, cooling, and ventilation systems in homes, stores, and factories. They check the systems, find problems, and make them work again. HVAC technicians have a series of steps they follow to make sure the heating, cooling, and ventilation systems work well and use energy efficiently.

First, HVAC technicians carefully look at the heating, cooling, and ventilation systems. They check things like air filters, fans, motors, and ducts to see if there are any issues or things that don't work. After looking at everything, they use their knowledge to find problems or things that don't work right. This could be an issue with keeping the temperature right, having clean air, getting enough air to flow, or using too much energy. They look at information, do tests, and listen to what customers say to find the main cause of the problem.

Once they know what's wrong, HVAC technicians get to work fixing it. They may repair things that don't work well, replace parts that are too old, clean the ducts, change settings, or make adjustments. They do whatever is needed to make sure the systems work at their best and make customers happy.

1. Identify the **sequence of tasks** that might be performed by HVAC technicians and **write** it down in the space provided.
2. Based on the passage, **discuss** with your partner how advancements in HVAC technology might impact the work of HVAC technicians.

The sequence of tasks performed by HVAC technicians is:

Passage 2 - Maintenance Career: Elevator and Escalator Installers and Repairers

Elevator and escalator installers and repairers are skilled professionals who install, maintain, and fix elevators, escalators, and other lifts. They put together and install elevator parts, check them regularly, find problems, and repair or change parts that don't work right.

These experts take care when assembling and installing elevator and escalator parts to make sure everything fits and works smoothly and safely. They also do regular checks and maintenance to make sure the transportation systems work well. They look for signs of damage, fix mechanical parts, and test safety features. When something goes wrong, they figure out the problem and repair or replace the parts that aren't working.

Elevator and escalator installers and repairers also talk to customers, building owners, and their teams to discuss what's needed for projects, give updates on maintenance and repairs, and give advice on how to use elevators and escalators safely.

1. Identify instances where **professionalism** is required in the role. **Discuss** these with your partner.
2. **Make predictions** about how professionalism can positively impact the work of elevator and escalator installers and repairers. **Write** them in the space provided.

Professionalism can positively impact the work of elevator and escalator installers by...

Passage 3 - Maintenance Career: Septic Tank Servicers and Sewer Pipe Cleaners

Septic tank servicers and sewer pipe cleaners have the important job of checking, taking care of, and cleaning septic tanks and sewer pipes. They do tasks like taking out waste from septic tanks, getting rid of things blocking sewer pipes, and looking at how well the systems are working. These experts play a big part in making sure septic systems and sewer infrastructure work well and stay clean.

Septic tank servicers and sewer pipe cleaners inspect septic tanks and sewer pipes to make sure they are in good condition. They check for any problems, leaks, or damages that need fixing. When there are blockages or things stuck in the pipes, they work to remove them and make

everything flow smoothly again. They also pump out waste from septic tanks to keep them from getting too full.

These skilled professionals help keep our environment clean and safe by taking care of septic systems and sewer pipes. They make sure everything works properly and there are no issues that could cause problems.

1. Identify a **sequence of tasks** that septic tank servicers and sewer pipe cleaners typically perform. **Discuss** them with your partner.
2. Write a paragraph describing the importance of septic tank servicers and sewer pipe cleaners in maintaining the sanitation and functionality of septic systems and sewer infrastructure. Your paragraph should contain at least four sentences.

Septic tank servicers and sewer pipe cleaners have an important role to play in maintaining the sanitation and functionality of septic systems and sewer infrastructure...

Maintenance Tasks - Steps

Name: _____

Date: _____

Directions:

- Select a common maintenance task from the list below.
- Write down the steps you will take to complete this task. Include the tools and materials you will use, the order in which you will complete the task and the safety precautions you will take.
- Task options:
 - Changing a light bulb
 - Fixing a loose doorknob
 - Unclogging a sink
- If you finish the first task within time, pick a second task and write down the steps.

Task 1 : _____

Tools/ Materials:

Safety Precautions:

Steps to complete the task:

Task 2 : _____

Tools/ Materials:

Safety Precautions:

Steps to complete the task:

Reflection Exit Slip

In one sentence, describe what you learned in this lesson.

Today, I learned _____.

Is one of the careers discussed today of interest to you? Why or why not?

I liked / did not like _____ career because _____

Is there anything you still need help understanding?

What's one question you have?

Circle the emoji that shows how you feel about your mastery of content in this lesson.



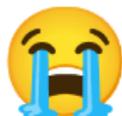
Happy



Smart



Confused



Sad



Angry