

Emerging Careers in Welding Curriculum



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2709 Mondovi Road
Eau Claire, WI 54701 USA
800.830.1416
+1.715.830.2040
www.realityworks.com

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This curriculum introduces students to a variety of emerging careers in welding.

Curriculum Structure

The *Emerging Careers in Welding Curriculum* is comprised of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	Robotic Welding Technician	60-80 minutes
Two	Advanced Materials Welder	50-55 minutes
Three	Welding Quality Assurance and Inspection	55-75 minutes
Four	Welding Automation Integrated Specialist	50-55 minutes
Five	Renewable Energy Welding Specialists	30-40 minutes
	Total	4-5 hours

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table, which lists lesson activities, materials required, suggested preparation steps and approximate class time.

Lesson Sections

The actual lesson follows the overview, which contains some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, game, demonstration, or review of previous lesson information. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Robotic Welding Technician

Lesson Overview

Robotic Welding is an emerging career area. This lesson will expose students to just what this career entails and how they can become a robotic welding technician.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify what a robotic welding technician is
- Understand what a day on the job looks like
- Assess whether this job is one that they would like

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>A Day in the Life of a Robotic Welding Technician</i> worksheet • Welding videos	1. Print/photocopy the <i>A Day in the Life of a Robotic Welding Technician</i> worksheet (one per participant).	10-15 minutes
LEARN	• Welding videos • <i>Creating an Infographic: What's the Robotic Welding Buzz?</i> worksheet • Internet access	1. Prepare to share videos. 2. Print/photocopy the <i>Creating an Infographic: What's the Robotic Welding Buzz</i> worksheet – one per participant (one per participant).	30-45 minutes
REVIEW	• <i>Being Robotic Welding Technician Is/Is Not the Career Field for Me</i> worksheet • Infographics created and posted by participants in the LEARN portion of the lesson	1. Print/photocopy the <i>Being a Robotic Welding Technician Is/Is Not for Me</i> worksheet (one per participant).	20 minutes

Lesson One – Robotic Welding Technician

FOCUS: What Is Robotic Welding?

10-15 minutes

Purpose:

This lesson introduces students to robotic welding. They will learn what it is and the types of occupations they could pursue.

Materials:

- *A Day in the Life of a Robotic Welding Technician* worksheet
- Welding videos

It may be useful to preview the *Day in the Life of a Robotic Welding Technician* worksheet before watching the video. Have learners complete the third column identifying what they have learned in the video clip.

4. After the video is done, go through the worksheet and ask participants to share answers.

Facilitation Steps:

1. Share these statistics with the participants:
Employment of economists is projected to grow 2 percent from 2024 to 2034, with 457,300 positions open in the United States.

About 45,600 openings for robotic welding technicians are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who retire or other worker turnover.

Define robotic welding. Show this brief video to introduce students to the concept.

<https://www.youtube.com/watch?v=J5rAhNw5k0k>

2. Ask participants what they think a typical day is like in the life of robotic welding. Give participants the *A Day in the Life of a Robotic Welding Technician* worksheet. Have learners complete the column about what they already know and what they would like to know about this career.
3. Play a video on what it is like to work as a robotic welding technician.

Here are some video options:

[Being a robot weld operator at BTD](#)

[Day in the Life: Darron Threatt, Aerospace Weld Technician](#)

[How Welding Robot Works | ABAGY ROBOTIC WELDING](#)

A Day in the Life of a Robotic Welding Technician

Instructions: Identify what you already know about being a robotic welding technician, what you want to know, and what you have learned during the lesson.

Know	Want to Know	Learned

Lesson One – Robotic Welding Technician

LEARN: Robotic Welding Deep Dive

30-45 minutes

Purpose:

The purpose of this activity is to help participants better understand what a robotic welding technician does.

Materials:

- *Creating an Infographic: What's the Robotic Welding Buzz?* worksheet
- Internet access

Facilitation Steps:

1. Distribute the *Creating an Infographic: What's the Robotic Welding Buzz?* worksheet. Explain to learners that they will make a digital infographic about this career field.
2. Share a sample infographic so they understand the look and feel of a typical infographic.

[10 Infographic Ideas to Inspire Your Next Visual Story](#)

3. Encourage participants to make sure their infographics include the required information. Using color, images, and a unique layout will make the infographic visually appealing for others.
4. Have participants print and post their infographics in a conspicuous location for use during the REVIEW part of the lesson. Allow time for participants to view infographics created by their peers.

Creating an Infographic: What's the Robotic Welding Buzz?

What is an infographic?

An infographic is a collection of pictures, charts, and text that gives an easy-to-understand overview of this occupation.

As you prepare to make your infographic digitally, use the internet to research the following information:

- ☐ Career as a robotic welding technician
- ☐ Education requirements
- ☐ Primary duties/responsibilities
- ☐ Professional organizations
- ☐ Work environment

Other requirements:

- ☐ At least one image or chart
- ☐ Neatness
- ☐ Use of some color
- ☐ Creative layout
- ☐ Large enough fonts ease of reading information

Lesson One –Robotic Welding Technician

REVIEW: Reflection

20 minutes

Purpose:

Participants will reflect on what they have learned about being a robotic welding technician and decide if this career is or is not a field for them to consider.

Materials:

- *Being Robotic Welding Technician Is/Is Not the Career Field for Me* worksheet
- Infographics created and posted by participants in the LEARN portion of the lesson

Facilitation Steps:

1. Distribute the *Being a Robotic Welding Technician Is/Is Not the Career Field for Me* worksheet.
2. Instruct participants to review the worksheet. As participants walk through the gallery and look at different participants' infographics, they must respond to facts they observe on the infographic.

Based on the number of participants/infographics to review, provide about 15 minutes for this activity.

3. Once participants have completed the worksheet, provide an opportunity for them to discuss what they recorded in each section of the worksheet.
4. Allow participants to share their thoughts about this career before wrapping up this lesson. Specific questions might include:
 - a. What would you enjoy?
 - b. What would you find the most challenging?

Being a Robotic Welding Technician

Is/Is Not the Career Field for Me

Instructions: Record information from the infographics in the spaces provided. Circle in the title if this career is or is not for you.

This is interesting!	Shocking info?!?!?!?	Is this for real?
I want to know more about this:	This sounds like something I would like:	I am not too sure about this:
I have a question:	I want to remember this:	Other (you choose):

Lesson Two – Advanced Materials Welder

Lesson Overview

An advanced materials welder is a professional who specializes in joining high-performance materials using advanced welding processes, which present unique challenges. Students will learn about this challenging emerging welding profession.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify what an advanced materials welder is
- Compare the different types of materials advanced materials welders works with
- Discuss the impact and job outlook of advanced materials welding

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• Advanced Materials Welder occupations video (choose one) • <i>What Is an Advanced Materials Welder?</i> worksheet	1. Print/photocopy the <i>What Is an Advanced Materials Welder professional?</i> worksheet (one per participant).	10-15 minutes
LEARN	• <i>Advanced Materials Welding Deeper Dive</i> worksheet	2. Print/photocopy the <i>Advanced Materials Welding Deeper Dive</i> worksheet.	15 minutes
REVIEW	• <i>Career Collage</i> worksheet • Career Collage Graffiti Space (made with a large piece of bulletin board paper (6 pieces total, 1 for each career) • Index cards • Glue • Markers	1. Before this activity, create a large poster space for each of the careers on the <i>Career Collage</i> worksheet. Label each space with one of the career titles on the worksheet list. 2. Print/photocopy the <i>Career Collage</i> worksheet.	25 minutes

Lesson Two – Advanced Materials Welder

FOCUS: What Is an Advanced Materials Welder?

10-15 minutes

Purpose:

Participants gain an overview of what an advanced materials welder is.

Materials:

- Advanced Materials Welder videos (choose one)
- *What is an Advanced Materials Welder* worksheet

Facilitation Steps:

1. Define an advanced materials welder for students. According to the Bureau of Labor Statistics:

An advanced materials welder is a welding professional who specializes in joining high-performance materials—such as high-strength alloys, titanium, composites, and other engineered materials—using advanced welding processes like laser welding, electron beam welding, and friction stir welding. These materials present unique challenges, including thermal distortion, microstructural changes, and sensitivity to heat, requiring welders to apply specialized techniques and quality controls.

Key Responsibilities

- Join high-strength and engineered materials using advanced welding processes
- Adapt welding procedures to minimize distortion and preserve material properties
- Interpret technical specs for advanced alloys and composites
- Work with advanced inspection tools, including ultrasonic and radiographic testing
- Collaborate with engineers on material behavior, process optimization, and quality control

2. Ask participants to identify what they think the benefits of working as an advanced materials welder are. Explain that they are going to watch a short video that introduces them to this as a career option. Give students the *What is an Advanced Materials Welder?* worksheet.
3. Play a few advanced materials welder videos of your choice. Here is one suggestion, but there are many more available on YouTube.
[Types of Advanced Welding Processes & Material Applications](#)
4. If you choose not to watch the video, you can have participants complete the worksheet using their own research or opinions on the answers.
5. After the video is done, go through the worksheet and ask participants to share answers.

What Is an Advanced Materials Welder?

1. What qualities would an effective advanced materials welder have?
2. How can you become an advanced materials welder?
3. What types of duties would you do as an advanced materials welder?
4. What kind of job market is there currently for advanced materials welders?
5. What would be the most difficult part of being an advanced materials welder?

Lesson Two – Advanced Materials Welder

LEARN: Adding to What You Know

15 minutes

Purpose:

The purpose of this activity is to help participants understand what it would be like to be an advanced materials welder.

Materials:

- *Advanced Materials Welding Deeper Dive* worksheet

Facilitation Steps:

1. Share the following information with students:
An advanced materials welder is a welding professional who specializes in joining high-performance materials using advanced welding processes. These materials present unique challenges requiring welders to apply specialized techniques and quality controls.
2. Distribute the *Advanced Materials Welding Deeper Dive* worksheet.
3. Students are to complete each column on the worksheet
4. After all students have completed their research, have them share the information for each column that they found.
5. Here is additional information in case students do not find all of the answers.

High-Performance Materials Used by Advanced Materials Welders

- Titanium alloys
- Nickel-based superalloys (e.g., Inconel, Hastelloy, Monel)
- High-strength low-alloy (HSLA) steels
- Maraging steels

- Duplex and super-duplex stainless steels
- Aluminum-lithium alloys
- Carbon fiber-reinforced composites
- Ceramic matrix composites (CMCs)
- High-performance engineering polymers (e.g., PEEK)
- Copper-based high-performance alloys (e.g., beryllium-copper)

Advanced Welding Processes Used by Advanced Materials Welders

- Laser welding
- Electron beam welding
- Friction stir welding
- Narrow gap welding
- Laser-arc hybrid welding
- Underwater welding

Unique Challenges in Advanced Materials Welding

- Thermal distortion due to high-performance materials' sensitivity to heat
- Microstructural changes requiring precise heat control
- Material sensitivity to heat causing potential degradation
- Need for specialized techniques to preserve material properties
- Use of advanced inspection tools like ultrasonic and radiographic testing
- Adapting welding procedures to minimize distortion
- Working with engineered materials that require strict quality controls

Advanced Materials Welding Deeper Dive

Instructions: Use the space provided to research key facts about the career's challenges. Let's find out more!

High-Performance Materials Used	Advanced Welding Processes Performed	Unique Challenges Presented on the Job

Lesson Two – Advanced Materials Welder

REVIEW: Reflection

25 minutes

Purpose:

Participants will reflect on this welding-related career. They will research to assess their desire for a career in this area.

Materials:

- *Career Collage* worksheet
- Career Collage Graffiti Space (made with a large piece of bulletin board paper (6 pieces total, 1 for each career)
- Index cards
- Glue
- Markers

Facilitation Steps:

1. Before this activity, create ample poster space for each question on the *Career Collage* worksheet.
2. Distribute the *Career Collage* worksheet. Ask participants what they think a career collage might look like.
3. Explain to participants that they will have about 15 minutes to research this career and take some notes.
4. From there, they will use the markers, index cards, and *Career Collage* worksheet to add to their Career Collage Graffiti Space. Encourage participants to write keywords and draw related images to create a graffiti wall all about this career.
5. Allow participants time to research and then use the index cards and other resources to complete the Career Collage Graffiti Space.

Career Collage

Instructions: Use the space provided to research key facts about the career. Collect as much information as possible to assist you in creating the Career Collage Graffiti Wall. After completing the research, use index cards, markers, etc. to add to the graffiti wall. Take information from the research notes below.

Main Duties:	Required Training:
Job Outlook:	Other:

Lesson Three – Welding Quality Assurance Professional or Inspector

Lesson Overview

Welding quality assurance workers and welding inspector roles often overlap, but their focus, authority, and responsibilities differ. In this lesson, students will explore what each occupation is and does.

Lesson Objectives

After completing this lesson, participants will be able to:

- Compare the roles and requirements of careers in welding quality assurance and inspection
- Identify typical job duties performed by welding quality assurance workers and inspectors

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• Welding Quality Assurance and Inspection videos • <i>Pros and Cons: Welding Quality Assurance Versus Welding Inspection</i> worksheet	1. Print/photocopy the <i>Pros and Cons: Welding Quality Assurance Versus Welding Inspection</i> worksheet (one per participant). 2. Prepare to share videos.	15-25 minutes
LEARN	• <i>Welding Quality Assurance Professional or Welding Inspector for a Day</i> worksheet • Internet access	1. Print/photocopy the <i>Welding Quality Assurance Professional or Welding Inspector for a Day</i> worksheet (one per participant).	20-30 minutes
REVIEW	• <i>Welding Quality Assurance and Welding Inspection Careers Investigation Station</i> worksheet	1. Print/photocopy the <i>Welding Quality Assurance and Welding Inspection Investigation Station</i> worksheet (one per participant).	20 minutes

Lesson Three – Welding Quality Assurance Professional or Inspector

FOCUS: QA Versus Inspection

15-25 minutes

Purpose:

This lesson will take a look at what it is like to work in two related but different areas, quality assurance and inspection

Materials:

- Welding QA and Inspection videos
- *Pros and Cons: Welding Quality Assurance Versus Welding Inspection* worksheet

Facilitation Steps:

1. Ask participants how they think working in quality assurance differs from welding inspection. Share the information in these videos about the differences.

[Welding Inspection & Quality Assurance, Owen Francis](#)

[Quality Assurance Manager \(Welding Engineering\), Career Video from drkit.org](#)

[Welding Inspection - An Ordinary Day With QCTURK](#)

2. Distribute the *Pros and Cons: Welding Quality Assurance Versus Welding Inspection* worksheet. Have students use the internet or their own background knowledge to complete this worksheet.
3. After the video is done, go through the *Pros and Cons: Welding Quality Assurance Versus Welding Inspection* worksheet, and ask participants to share answers.

Welding Inspection Careers	
Pros:	Cons:

Lesson Three –Welding Quality Assurance Professional or Inspector

LEARN: QA or Inspector for a Day

20-30 minutes

Purpose:

The purpose of this activity is to help participants better understand what it is like to be either a welding quality assurance worker or inspector on a typical workday.

Materials:

- *Welding Quality Assurance Professional or Welding Inspector for a Day* worksheet
- Internet access

Facilitation Steps:

1. Distribute the *Welding QA or Inspector for a Day* worksheet.
2. Explain to participants that, using the internet and their knowledge, they will create a detailed journal for what their day might be like.
3. Encourage participants to make sure their detailed journal entries contain accurate information.

Teacher notes for reference:

Welding Quality Assurance Professional:

A welding quality assurance (QA) professional focuses on developing, implementing, and maintaining the systems and processes that ensure all welding work meets required codes, standards, and customer specifications.

These professionals are responsible for quality planning, procedure development, compliance documentation, and oversight of the overall quality management program. They often work at an organizational or project-wide level.

Key Responsibilities:

- Develop Quality Assurance programs and procedures for welding operations
- Ensure compliance with codes such as AWS, ASME, ISO, or API

- Oversee welder qualifications and welding procedure specifications (WPS/PQR)
- Conduct audits and verify documentation
- Work with engineering, inspection, and production teams to resolve quality issues

Welding Inspector:

A welding inspector focuses on the direct examination of welds to ensure they meet applicable standards and specifications.

Inspectors perform visual inspections, nondestructive testing (NDT), and dimensional checks. They work hands-on in the field or shop to verify that welder performance and welding processes produce acceptable results.

Key Responsibilities:

- Perform visual inspections of welds (VT)
- Conduct or coordinate nondestructive testing (e.g., UT, RT, MT, PT)
- Verify fit-up, joint preparation, and welding parameters
- Document results and report nonconformances
- Ensure welds meet approved WPS requirements

Summary of Differences:

- A QA professional manages systems; an inspector evaluates individual welds
 - QA focuses on processes; inspection focuses on results
4. Give students time online to research the occupations.
 5. Divide participants into groups of four and have them discuss their detailed journal entries.

Welding QA or Inspector for a Day

Instructions: Use the space provided to record the details of your day as either a welding QA or Inspector. Use personal knowledge and internet information to make your journal sound as interesting and accurate as possible.

Time	Activity	My Reaction

Lesson Three –Welding Quality Assurance Professional or Inspector

REVIEW: Reflection

20 minutes

Purpose:

Participants will reflect on the different careers in QA or inspection. They will complete a short research project to learn more about career opportunities.

Materials:

- *Welding Quality Assurance or Welding Inspection Career Investigation Station* worksheet

Facilitation Steps:

1. Distribute the *Welding Quality Assurance or Welding Inspection Career Investigation Station* worksheet.
2. Instruct participants to complete a short research project to learn more about this career path.
3. Once participants have completed *Welding Quality Assurance or Welding Inspection Career Investigation Station* worksheet, have them discuss what they recorded in each worksheet section.
4. Allow participants to share their thoughts about a career in QA or Inspection before wrapping up this lesson. Specific questions can be:
 - a. What would you find most interesting?
 - b. What would be the most challenging for you?

Welding Quality Assurance or Welding Inspection Career Investigation Station

Instructions: Use the internet to research more about a career in QA and Inspection.

Choose the type of occupation you wish to investigate: Welding Quality Assurance Professional or Welding Inspector	Job Description (list at least 3 requirements): 1. 2. 3. 4. 5.
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Required Training:	
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Lesson Four – Welding Automation Integration Specialist

Lesson Overview

In this lesson, participants will explore an occupation in welding automation. Participants will learn about typical job duties, pay, job outlook, and potential for this position.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify what a welding automation integration specialist is and does
- Discuss the impact and job outlook of welding automation integration specialists

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• Welding automation integration specialist video (choose one) • <i>What is a Welding Automation Integration Specialist?</i> worksheet	1. Print or photocopy the <i>What is a Welding Automation Integration Specialist?</i> worksheet (one per participant).	10-15 minutes
LEARN	• Internet • <i>Welding Automation Integration Specialist Job Posting Review</i> worksheet	1. Print or photocopy the <i>Welding Automation Integration Specialist Job Posting Review</i> worksheet (one per participant).	25 minutes
REVIEW	• <i>Employability Skills in Welding</i> worksheet	1. Print or photocopy the <i>Employability Skills in Welding</i> worksheet (one per participant).	15 minutes

Lesson Four –Welding Automation Integration Specialist

FOCUS: What Is a Welding Automation Integration Specialist?

10-15 minutes

Purpose:

Participants gain an overview of what a welding automation integration specialist is.

Materials:

- Welding automation integration specialist video (choose one)
- *What is a Welding Automation Integration Specialist?* worksheet

Facilitation Steps:

1. Share these statistics with the participants:
 - The median annual wage for welding specialists is \$47,505 per year.
 - Projected growth: 2% from 2018 to 2028.

The source of this information is the Bureau of Labor Statistics. They do not track welding automation integration specialists specifically. They do have a category that is closely aligned, called a welding specialist.

2. What is a welding automation integration specialist?

Define it for students.

A welding automation integration specialist is a professional who designs, integrates, and oversees automated welding systems. They analyze welding processes, integrate robotics and smart technologies, and develop custom automation solutions.

Their role includes concept development, system design, process integration, verification, and ongoing support, combining welding engineering with automation and digital manufacturing technologies.

3. Ask participants what they think are the benefits of working as a welding automation integration specialist.

4. Distribute the *What Is a Welding Automation Integration Specialist?* worksheet and explain that learners are going to watch a short video.
3. Play a few welding automation videos of your choice. Here are a few suggestions but there are many more available on YouTube.

Note: Most sources equate welding automation with robotic welding

[KUKA Robots Driving Innovation in the Automotive Industry #weldingrobot #kuka #automation #robots](#)

[From Doubt to Success. From Manual to Automated Welding | ABAGY ROBOTIC WELDING](#)

[Hyundai Robotics HS220 for Automotive welding process](#)

If you choose not to watch the video, you can have participants complete the worksheet using their own research or opinions on the answers.

4. After the video is done, go through the worksheet, and ask participants to share answers.

What Is a Welding Automation Integration Specialist?

1. What do you think would make a good welding automation integration specialist? What qualities should they have?
2. How can you become a welding automation integration specialist?
3. What types of duties would you have as a welding automation integration specialist?
4. What kind of job market is there currently for this occupation?
5. What would be the most difficult part of being a welding automation integration specialist?

Lesson Four – Welding Automation Integration Specialist

LEARN: Adding to What You Know

25 minutes

Purpose:

The purpose of this activity is to help participants understand what employers are looking for in a welding automation integration specialist.

Materials:

- Internet
- *Welding Automation Integration Specialist Job Posting Review*

Facilitation Steps:

1. Distribute the *Welding Automation Integration Specialist Job Posting Review* worksheet.
2. Using the internet, have learners search for a real job posting for a welding automation integration specialist.
3. Give students 15-25 minutes to complete the questions.
4. Call the class back together and ask for volunteers to read the original job posting. Then, share some of the answers to the questions.
5. Explain that while technical skills are important on the job, employability skills, sometimes called soft skills, are just as important.

Welding Automation Integration Specialist Job Posting Review

Instructions: Using your job posting and the internet, answer the questions below in the space provided.

Job Posting Information

1. Job title as listed in the posting:
2. Company name:
3. Job location:
4. Link to the job posting:
5. Brief summary of the job posting:

Understanding the Position

1. What primary responsibilities does this position include?
2. What types of welding automation systems or technologies does the posting mention?
3. What technical skills or certifications are required or preferred?
4. What soft skills (communication, teamwork, problem-solving, etc.) is the employer looking for?
5. What education or experience level is required?

6. What industries does the role support (e.g., aerospace, automotive, manufacturing)?

Deeper Understanding

1. Why do you think welding automation is important in this job?
2. What part of this job seems most interesting to you and why?
3. Would you consider a career in welding automation integration? Explain.

Lesson Four –Welding Automation Integration Specialist

REVIEW: Importance of Soft Skills

15 minutes

Purpose:

Employability skills are skills that help you get and keep a job. This activity will explore the soft skills that make a welding automation integration specialist successful.

Materials:

- *Employability Skills in Welding* worksheet

Facilitation Steps:

1. Distribute the *Employability Skills in Welding* worksheet.
2. Give students the following definition to ensure they understand what employability skills are:

Employability skills are the essential abilities, behaviors, and personal qualities that help individuals succeed in the workplace—regardless of the specific job or industry. These skills are not technical or job specific. These skills relate to how a person works, communicates, solves problems, and interacts

with others. They help workers perform effectively on the job, adapt to changing work environments, collaborate with team members, and meet employer expectations.

In welding careers, employability skills support workplace safety, quality craftsmanship, productivity, professional relationships, and overall career advancement.

Students who build strong employability skills are better prepared for real-world job expectations, interviews, and long-term career growth.

3. Explain that learners are to choose which employability skills they believe would be the most important in a welding automation integration specialist job and why.
4. Ask for volunteers to share their top five skills. Keep track on a whiteboard and see which top five the entire class identifies collectively.

Employability Skills in Welding

Instructions: Choose the top five employability skills you believe a welding automation integration specialist should have to be successful and why.

Employability Skills as a Welding Automation Integration Specialist

- Reliability and punctuality
- Strong work ethic
- Teamwork and collaboration
- Communication skills
- Problem-solving abilities
- Critical thinking
- Adaptability and flexibility
- Time management
- Professionalism
- Attention to detail
- Accountability and responsibility
- Positive attitude
- Willingness to learn
- Stress management
- Interpersonal skills
- Perseverance and resilience
- Self-motivation
- Organizational skills

Soft Skill Chosen	Why

Lesson Five – Renewable Energy Welding Specialist

Lesson Overview

In this lesson, participants will explore an occupation in renewable energy. Participants will learn about typical job duties, pay, job outlook, and potential for a renewable energy welding specialist.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify what a renewable energy welding specialist is and does
- Discuss the impact and job outlook of renewable energy welding specialists

Lesson at a Glance

Activity		Preparation	Approximate Class Time
FOCUS	• <i>What Is a Renewable Energy Welding Specialist?</i> worksheet	1. Print/photocopy the <i>What Is a Renewable Energy Welding Specialist?</i> worksheet (one per participant).	5-10 minutes
LEARN	• <i>Compare and Contrast</i> worksheet • Internet access	1. Print/photocopy the <i>Compare and Contrast</i> worksheet (one per participant).	10-15 minutes
REVIEW	• <i>Being a Renewable Energy Welding Specialist Is/Is Not the Career for Me</i> worksheet	1. Print/photocopy the <i>Being a Renewable Energy Welding Specialist Is/Is Not the Career for Me</i> worksheet (one per participant).	15 minutes

Lesson Five – Renewable Energy Welding Specialist

FOCUS: What Is a Renewable Energy Welding Specialist?

5-10 minutes

Purpose:

Participants gain an overview of what a renewable energy welding specialist is.

Materials:

- Renewable Energy Welding Specialist video (choose one)
- *What is a Renewable Energy Welding Specialist?* worksheet

Facilitation Steps:

1. On a whiteboard, break this occupation into two parts: Renewable Energy and Welding Specialist.
2. Distribute the *What is a Renewable Energy Welding Specialist* worksheet.
3. Have each student complete the worksheet to come up with what they believe is the definition of a renewable energy welding specialist.
4. Have several students volunteer their definition.
5. Share the following definition:

A renewable energy welding specialist is a welding professional who supports the construction, installation, and maintenance of renewable energy systems—such as wind turbines, solar arrays, and other clean-energy structures.

They apply advanced welding skills to fabricate and assemble metal components that must withstand harsh outdoor environments, extreme temperatures, and structural stresses. Their work ensures the integrity, safety, and longevity of renewable energy infrastructure.

What Do They Do?

- Weld and fabricate steel components for wind turbine towers, nacelles, and internal structures
- Perform precision welding for solar panel mounting systems requiring minimal distortion
- Conduct repairs, inspections, and maintenance on renewable energy equipment in demanding conditions such as offshore sites, high elevations, or remote environments
- Follow strict quality, safety, and environmental standards to ensure reliable operation of clean energy systems
- Apply advanced welding processes and adapt techniques for corrosion resistance and durability in renewable-energy-specific applications

What Is a Renewable Energy Welding Specialist?

Renewable Energy	Definition:
Welding Specialist	Definition:

Renewable Energy + Welding Specialists =

Put both parts together and create your personal definition of what you believe a renewable energy welding specialist is and does.



Lesson Five – Renewable Energy Welding Specialist

LEARN: Compare and Contrast

10-15 minutes

Purpose:

Participants gain an overview of what a renewable energy welding specialist is compared to a fossil fuel industry welding specialist.

Materials:

- *Compare and Contrast* worksheet
- Internet access

Facilitation Steps:

1. Share a short video with the class about the difference between renewable energy welding and fossil-fuel industry welding. These would definitely be opposites!

[Fossil Fuels vs Renewable Energy](#)

[Underwater Welding: A Deep Dive into Renewable Energy](#)

[Northwoods Future PAC - Warriors in Congress](#)

[Oil and Gas Product Equipment Manufacturer Evolves Welding Processes for Increased Production](#)

2. Distribute the *Compare and Contrast* worksheet. Instruct learners to research more information about each profession and record similarities and differences on the chart.
3. After participants complete the worksheet, discuss their answers.

4. Share the following information with the class:

A renewable energy welding specialist focuses on constructing, maintaining, and repairing structures used in clean-energy systems such as wind turbines and solar arrays. The opposite of this role is a welding specialist who works in the fossil-fuel industry.

This opposite role—often called an oil and gas pipeline welder, refinery welder, or fossil-fuel industry welding technician—focuses on welding tasks that support traditional energy systems such as oil rigs, petroleum refineries, coal-fired plants, and gas pipelines.

Instead of supporting renewable energy infrastructure, these welders fabricate, repair, and maintain equipment used in extracting, transporting, and processing fossil fuels. Their work often involves high-pressure systems, extreme heat environments, and strict industrial standards related to petroleum and chemical processing.

In summary, while renewable energy welding specialists support clean-energy structures designed for sustainability, their counterparts support conventional fossil-fuel-based energy systems that rely on non-renewable resources.

Compare and Contrast

Instructions: Record similarities and differences for these careers in the respective spaces.

Renewable Energy Versus Fossil Fuel Industry Welding Specialists	
Similarities	Differences

Lesson Five – Renewable Energy Welding Specialist

REVIEW: Reflection

15 minutes

Purpose:

Participants will reflect on what they have learned about being a renewable energy welding specialist and decide if this career is or is not for them.

Materials:

- *Being a Renewable Energy Welding Specialist Is/Is Not the Career for Me* worksheet

Facilitation Steps:

1. Distribute the *Being a Renewable Energy Welding Specialist Is/Is Not the Career Field for Me* worksheet.
2. Once participants have completed the worksheet, provide an opportunity for them to discuss what they recorded in each section of the worksheet.
3. Allow participants to share their thoughts about a career as a renewable energy welding specialist before wrapping up this lesson. Specific questions might include:
 - a. What would you enjoy?
 - b. What would you find the most challenging?

Being a Renewable Energy Welding Specialist Is/Is Not the Career for Me

Instructions: Record information from the infographics in the spaces provided. Circle in the title if this career is or is not for you.

This is interesting!	Shocking info?!?!?!?	Is this for real?
I want to know more about this:	This sounds like something I would like:	I am not too sure about this:
I have a question:	I want to remember this:	Other (you choose):