Junior Achievement JA TRADES

Welding Training

Junior Achievement™ USA

Member of JA Worldwide

What is JA Trades?

- Junior Achievement of Greater St. Louis offers a program called JA Trades, designed to introduce middle and high school students to careers in the trades. This hands-on program emphasizes the value of STEM skills and provides real-world experiences across a variety of trade professions.

- Students rotate through different stations to gain practical insight into careers such as HVAC technicians, electricians, carpenters, and more.

- Volunteers play a vital role in the success of this program. We appreciate your support and hope your experience is both rewarding and memorable.

Why teach Trades?

- High Demand: Skilled workers are needed more than ever as many retire.
- Career Path: Trades offer a solid, well-paying alternative to college.
- Hands-On Learning: Ideal for students who prefer practical, real-world skills.
- Strong Earnings: Many trade jobs offer great pay and benefits.
- Essential Roles: Trades are critical to keeping our communities running.

Volunteer Role

- Students will rotate through several trade stations to gain first-hand experience with different skilled careers. Your role is to lead a simulation that teaches students how to weld. You'll introduce the activity, guide them through the steps, and help them understand how this equipment is used on real job sites.

What is Welding?

- Welding is like using a super-strong, very hot glue to stick two pieces of metal together, so they become one. A welder uses a tool that makes a lot of heat, which melts the edges of the metal. They often add a special filler metal that also melts and fills in the space between the two pieces.

Industries that use Welding

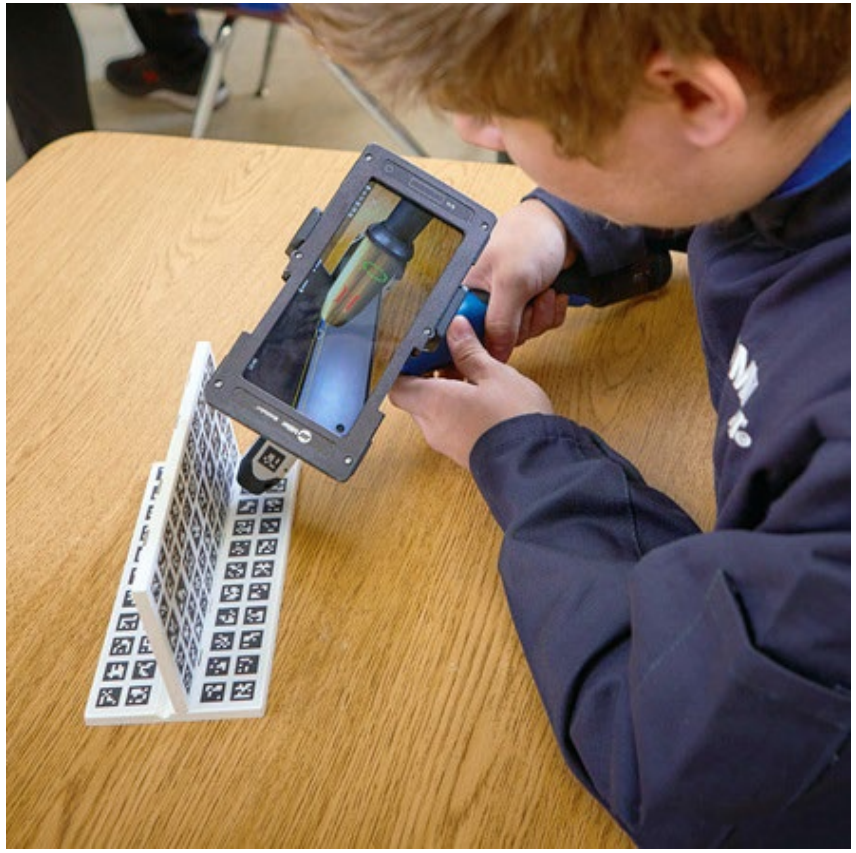
- Manufacturing
- Construction
- Automotive
- Shipping
- Railroad
- Agriculture
- Military
- Oil & Gas

Certification Information

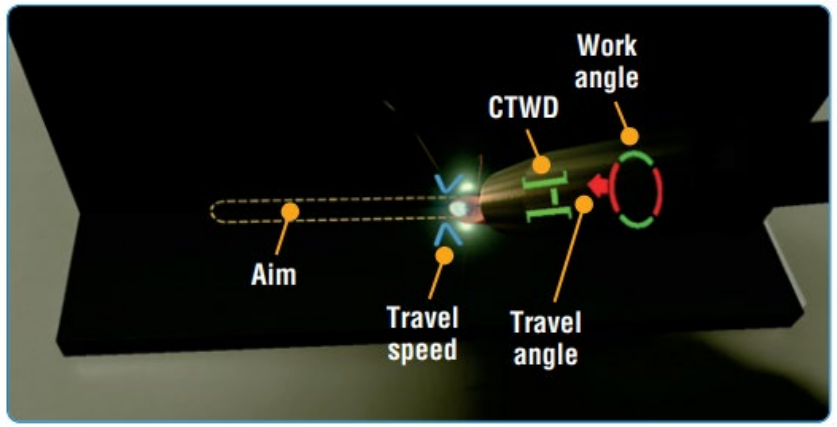
- High School diploma or GED
- Enroll in a welding technician program to learn fundamental welding techniques and procedures.
- Choose a Certification: Select the type of certification that aligns with your career goals, such as the American Welding Society Certified Welder (CW).
- Performance-based certification exam.

Welding Simulation

Welding System



Welding Simulation Screen



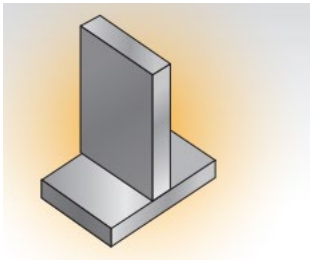
Post-weld Feedback Screen

Student Activities

Students will take turns practicing three different types of welding:

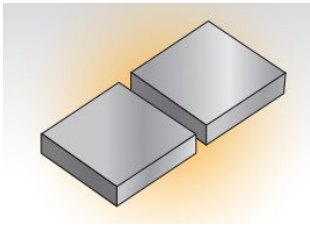
- T-Joint
- Butt Joint
- Lap Joint

These hands-on simulations give students a feel for real equipment operation and basic material handling techniques.



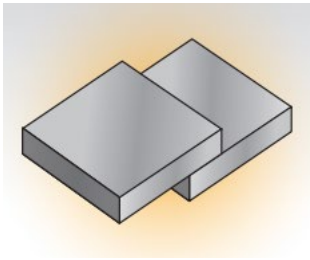
» T-Joint

- Joins two members that meet at a T-shaped angle
- Good mechanical properties, especially when welded from both sides
- Easily welded with little or no joint preparation
- Usually fillet welded, although J-grooves are possible



» Butt Joint

- Joins two members that meet at their edges on the same plane
- Used in applications where a smooth weld face is required
- Fillet or groove welded; groove welding requires added expertise and expense
- Improper design/welding risks distortion and residual stresses



» Lap Joint

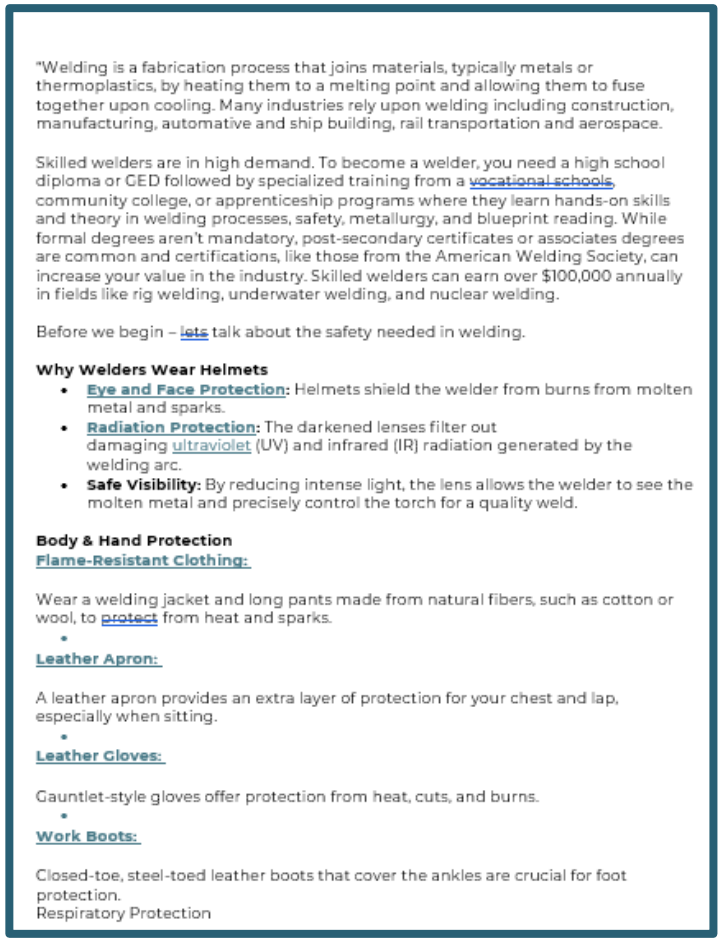
- Joins two members having overlapping surfaces
- Good mechanical properties, especially when welded from both sides
- Usually fillet welded
- Thicker material requires more overlap

Safety as a Priority

- Welders protect themselves from the heat and electricity generated by the welding process.
- The items used include:

  flame resistant gloves, safety glasses, welding helmet, long-sleeved welding jacket, flame resistant clothing, steel-toed shoes.

Simulation Activity Instructions



"Welding is a fabrication process that joins materials, typically metals or thermoplastics, by heating them to a melting point and allowing them to fuse together upon cooling. Many industries rely upon welding including construction, manufacturing, automative and ship building, rail transportation and aerospace.

Skilled welders are in high demand. To become a welder, you need a high school diploma or GED followed by specialized training from a vocational schools, community college, or apprenticeship programs where they learn hands-on skills and theory in welding processes, safety, metallurgy, and blueprint reading. While formal degrees aren't mandatory, post-secondary certificates or associates degrees are common and certifications, like those from the American Welding Society, can increase your value in the industry. Skilled welders can earn over $100,000 annually in fields like rig welding, underwater welding, and nuclear welding.

Before we begin – lets talk about the safety needed in welding.

Why Welders Wear Helmets

- **Eye and Face Protection:** Helmets shield the welder from burns from molten metal and sparks.
- **Radiation Protection:** The darkened lenses filter out damaging ultraviolet (UV) and infrared (IR) radiation generated by the welding arc.
- **Safe Visibility:** By reducing intense light, the lens allows the welder to see the molten metal and precisely control the torch for a quality weld.

Body & Hand Protection

Flame-Resistant Clothing:

Wear a welding jacket and long pants made from natural fibers, such as cotton or wool, to protect from heat and sparks.

Leather Apron:

A leather apron provides an extra layer of protection for your chest and lap, especially when sitting.

Leather Gloves:

Gauntlet-style gloves offer protection from heat, cuts, and burns.

Work Boots:

Closed-toe, steel-toed leather boots that cover the ankles are crucial for foot protection.
Respiratory Protection

- You will receive a handout with detailed instructions upon your arrival to JA Trades. JA staff will check in to ensure you are comfortable with the task at hand and answer any questions you may have.

THANK YOU!

We look forward to seeing you at JA Trades!

Enjoy the Day!

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