Careers in Welding

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Welding is a dynamic industry with a BIG future

A CLEVER BRONZE-AGE WORKER WAS thinking outside the box one day 5,500 years ago when he came up with an inspired idea. A great way of making things with the bronze alloys that were being developed then, he reasoned, would be to heat them until they started melting and pound them together with a hammer. By combining heat and pressure in this way, craftsmen could make just about anything that required a metal like bronze.

This was the birth of welding, a process that has had a major impact on metalworking and product engineering ever since. Any number of metal, no matter how big or small, can be welded. Examples are everywhere, from vehicles like cars, trucks and motorcycles to rail cars, ships, aircraft, rockets and space stations. Construction is a huge market, with a pipeline, offshore oil platforms, giant wind turbines and solar panels. Welders help install and maintain boilers, antipollution systems and other large structures, as well as piping for industrial, commercial and residential facilities.

Welding is even used by artists to create sculptures and decorative items. There is almost no limit to what welding can do, especially since developments in the technology continually improve its accuracy, quality and versatility. Welding is, in fact, an increasingly high-tech skill. Welders are being trained to operate robots and other automated systems that use powerful lasers, electron beams and sometimes explosives to bond metals.

The ability to work with computers and program software is consequently vital to the successful operation of these systems.

Don Howard, a welding specialist at Concurrent Technologies Corp., an engineering firm in Johnston, Pa., estimates that 20%-25% of U.S. welding is automated and predicts this trend will grow by about 20% in the next few years.

“A lot of very intelligent people are coming into the welding community,” says Howard. There is money to be made, he notes, but the industry also offers career paths. “Welding is not just about working on a manufacturing line anymore. Once in the industry, people know they can find a niche.”

“Those are good times to be in welding,” says Patricio Mendez, director of the Canadian Center for Welding and Joining at the University of Edmonton in Alberta, Canada. Mendez notes that students who like designing and building with metal and are interested in fields such as materials engineering, robotics, lasers, computer programming and systems integration will find plenty of career opportunities in welding.

Many students are being introduced to the process with the help of virtual welding devices. Edison Welding Institute (EWI) of Columbus, Ohio, and Lincoln Electric of Cleveland, Ohio have developed virtual welding devices that are designed to teach the basics of welding in classrooms. The EWI system uses sensors that duplicate the look and feel of welding. Lincoln’s system includes a torch with sensors and a welding mask with special lenses that create realistic images of welding applications.

There are more than 80 welding processes. Most involve a skilled worker using a high-heat torch (2,800-plus degrees Fahrenheit), filler material that is usually in wire or stick form (though some welds don’t use fillers) to permanently bond metal pieces. Welding can also be used to cut and dismantle objects of all sizes as well as for repairs.

One common process is Gas Metal Arc Welding, or GMAW. In GMAW, an electrode, which is also the filler, is continuously fed through the nozzle of an arc torch. When the welder activates the torch, several operations take place: The electrode begins feeding through the nozzle, a direct current is generated that creates an arc when it comes in contact with the workpiece and shielding gases are released around the nozzle to protect the weld from atmospheric gases that could degrade its quality. The arc, whose movement the welder controls, consumes the electrode and fills in the weld joint, which creates the weld.

Other widely used techniques like Gas Tungsten Arc Welding (GTAW) and Shielded Metal Arc Welding (SMAW) are variations of the process. GTAW, for example, is a relatively low-heat method that uses a non-consumable tungsten electrode. Its low heat characteristic reduces distortion in thin metals, such as those used in aerospace. SMAW, also called “stick welding,” uses a flux-coated consumable electrode (“flux” is a chemical cleaning agent that removes oxidation from the metals to be joined) and is primarily used for repair and steel welding.

As the electrode burns, the flux disintegrates, which releases a shielding gas that protects the weld from degradation.

In more advanced welding technologies, lasers are combined with GMAW in a hybrid process to make what one expert calls “scalpel-like cuts” that are up to 1/4-inch deep, narrow and extremely precise. The GMAW part of the process then deposits the filler and melts it with a secondary heat source.

The influence of welding is so broad that many of the product designs and building techniques people take for granted would not be possible without it. With demand for skilled welders rising and the technology of welding becoming more advanced, especially where automation is concerned, students have a unique opportunity to learn a career that can be shaped around their interests.

“There are many aspects to welding,” Mendez says. “When people come in contact with it, they love it.”

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Welding Jobs: Awesome Choices

Amazing Pay

"NO WAY!"
What’s that you'll say when you hear about the amazing variety of welding jobs that are out there and how much they pay.

You like the idea of working outdoors? Traveling? Getting new skills and moving up in the world? There’s a welding job for you.

The same is true if you want an indoors-only job close to home. Or if you like sales or teaching or science or even research. Or if you want to start your own company.

The starting pay for most welding jobs is pretty basic, especially right out of high school. But, with more experience, the potential to earn two or three times that amount is definitely there.

And making $100,000 or more isn’t out of question. But only if you are willing to work in some far-off spots.

To put it bluntly, though, a big part of what a commercial diver does, says Allen Garber, who is the chief administrative officer at the Commercial Diving Academy in New Bern, Florida, out.

“Commercial divers have to find it, clear it, inspect it and repair it or build it new”—all in diving gear, says Garber. A lot of that involves welding. It’s challenging work, for sure.

OK, by now you know there is a wide range of jobs out there for welders. Everything from building dinosaur sculptures to building nuclear powerplants.

To put it bluntly, though, a big part of the job satisfaction is making money and a good living.

So what does welding pay? It depends on the kind of welding you do, where you do it, how long you’ve been doing it and how good you are at it.

Starting just out of high school with only basic welding skills, you are looking at $10, $12 or $14 an hour.

Underwater welding also pays well, but it depends on where you’re working. Garber, from the Commercial Diving Academy, says commercial divers doing “inland” work on bridges and powerplants mostly make $40,000 to $50,000 a year, but some make $60,000 or even $70,000 if they get a lot of overtime.

Work “offshore” on an oil rig, though, and you probably will start out at $60,000, Garber says. After a few years, you could make $100,000 or more. “But that’s a different type of career,” he says.

On an oil rig, you usually work 12 hours on, 12 hours off, every day for six weeks, then you come back to dry land for a week. It’s not for everyone.

Generally, “the more types of welding you master the more you can earn,” says Richard Seif. He’s the senior vice president of global marketing at Lincoln Electric, Cleveland, which makes all kinds of welding equipment and offers welding training.

If you have math and science skills, going to college to become a welding engineer just about guarantees good pay—more than $50,000 a year to start and thousands more a year after that, Seif says.

So where can welding take you in life? It’s really up to you.
OK, SO YOU’RE THINKING, “I COULD see getting into welding.” But you also may be thinking, “How do I make it happen? How do I get from here to there?”

The good news is there are plenty of routes you can take. Of course, like any trip, it depends on where you start. Some people are almost born into welding. It’s part of them. Maybe you grew up on a farm, where there is always something to build or repair. Or maybe your dad does construction, works in a factory or messes around with cars. For others, like Branden Muehlbran, it’s a thing that gets them hooked on welding.

“I was 13 on a family vacation. I watched a guy repair a dump truck. I thought it was the coolest thing I had ever seen,” says Muehlbrandt. Now he trains pipe welders at the Mechanical Trades Institute in Atlanta.

For a lot of people though, welding is something you get your first look at in high school. If that’s the case for you now, here’s what you should do: take every shop course you can in welding and metal fabrication.

You’ll learn about the different types of welding, like Gas Tungsten Arc Welding (GTAW), frequently referred to as TIG (Tungsten Inert Gas) and Gas Metal Arc Welding (GMAW), frequently referred to as MIG (Metal Inert Gas). There’s nothing like hands-on experience with a good instructor to convince you welding is awesome. And don’t forget about your other high school classes. You’ve got to have good math skills to do welding. You don’t need to know just addition, subtraction, multiplication and division; you also have to be good at problem solving and know basic geometry.

Science is key, too. After all, when you come down to it, welding is a kind of science. You need a basic understanding of how and why welding actually works before you can do it. It’s also a big plus to be a well-rounded person. You’ll find out that in just about any welding job you need to work with other people. To be able to talk a problem out. To be part of a team. Being a good student helps with that.

So, if you’re in high school and thinking about welding as a career, take whatever shop classes you can. Keep up with your math and science. Be well rounded.

Also look for chances to find real work experience with welding. Maybe you can find a part-time job in an autobody or tractor repair shop.

Here’s something else: Ask your shop teacher about courses you could take at a local or regional career-tech school, or a technical school or a community college. You can also look up schools that offer welding on the School Locator at www.careersinwelding.com.

Muehlbrandt, for instance, took a lot of welding classes in his high school in St. Petersburg, Fla., and ended up as an applied welding technology graduate of the Pinellas Technical Education Center in Clearwater, Fla.

If you’re not sure what, answer the question: “If you had to do this forever, would you like it?” What would you say? For some, the answer is yes and welding is their career.[2]

Step back a second. Remember how there are a lot of different routes to a good career in welding? Another one is going straight from high school to a four-year college. Or going from high school to work and then to college.

There are a lot of great jobs out there for people with welding talent and an engineering degree. Listen to Caleb Roepke.

Roepke’s a graduate student in the Department of Metallurgical and Materials Science at the Colorado School of Mines’ Center for Welding, Joining and Coating Research in Golden, Colorado. As you might guess from that last sentence, Roepke is neck-deep into the science behind welding.

He got his undergraduate degree in welding and metallurgical engineering from LeTourneau University in Longview, Texas. (You can major in that field at several other colleges, too, including Ohio State University in Columbus, Ferris State University in Big Rapids, Michigan, and the Colorado School of Mines in Golden, Colorado.)

“I like engineering, but I really wanted to be in something that’s very hands-on,” says Roepke. Welding/metallurgical engineering is just that.

Roepke’s—the big report he has to write to get his Ph.D.—is about hybrid laser-arc welding. Serious stuff.

After school he hopes to land a good-paying research-and-development job with a big company, maybe one that manufactures heavy equipment.

You’ve probably got the point. No matter where you are in life right now, there are a lot of options out there for you in the field of welding.

There’s a pattern to it all though. Getting into welding is all about being open to opportunities. Taking courses. Working hard. Learning on the job. Working as a welder who has been doing it for a living. And taking even more courses so you know more, get better and can offer more.

Because the more you know, the more people you can offer, and the better your chances are of doing well. And being happier. ☉
You can weld in construction, manufacturing, outdoors, underwater or even in space! The work environments. The possibilities are endless for careers in the welding industry. There is something for everyone, from hands-on (pipe welder), to education (welding educator) to entrepreneur (company founder) and adventure (underwater scientist) to politician (company founder) to high-tech (robotics welding technician) to research (research scientist) to entrepreneur (company founder and president) and adventure (underwater welder). Welding careers offer many kinds of paths you decide, you are only limited by your imagination.

The possibilities are endless for careers in the welding industry. There is something for everyone, from hands-on (pipe welder), to education (welding educator) to high-tech (robotics welding technician) to research (research scientist) to entrepreneur (company founder and president) and adventure (underwater welder). Welding careers offer many kinds of work environments. You can work indoors, outdoors, underwater or even in space! You can weld in construction, manufacturing, research lab, or in an art studio or you can negotiate deals in a conference room. You can work for a large firm or small start-ups or even explore entrepreneurial opportunities. On the following pages we will detail 10 popular career paths in the welding industry and answer some of your questions. What do the people who have these jobs do? Why are these jobs important? What type of training and education do you need to get these jobs? These stories could help you decide, “Is this job for me?”

**Q&A**

**Bernardo Loya Jr.** Age: 25

*Apprentice ironworker*

*Ironworkers Union Local 300, Dayton, Ohio*

*HIGH SCHOOL: Francisca Villa High School, Ascension, Mexico*

*How did you get interested in your career?*

Bernardo: I grew up in Chihuahua, Mexico. My mom wanted me to be a teacher, but I like to work with my hands and build stuff. My dad is an ironworker. In this job you get to do lots of different things.

*What kind of training and education did you need to get this job?*

Bernardo: The union trains you while you work. I'm a fourth-year apprentice. In nine more weeks I will qualify as a journeyman. Then I can take classes to get other certifications or refreshers courses to renew my certifications. The more jobs you are certified to do, the more work opportunities there are.

*What's a typical day like in your job?*

Bernardo: We work in places like construction sites, steel factories and powerplants. Right now I'm doing maintenance and machine repair on a blast furnace. It's a gruelling job. I prefer structural work. The job is outside, you can move around more, and it's quick—in six months you're on to something else.

*What do you like most about your job?*

Bernardo: I go places no one else goes—like the inside of a blast furnace!

*What advice do you have for young people who are considering this career?*

Bernardo: Stay in school. That was hard for me because I was working to pay my way through high school in Mexico. Also, study math. That was hard for me, too. I never really liked it, but now I need to know how to calculate things like how much load a crane can lift and at what angle you need to lift it.

**Lisa Legohn**

*Associate professor of welding*

*Los Angeles Trade Technical College, Los Angeles, Calif.*

*How did you get interested in welding?*

Lisa: In high school, I enrolled in the Regional Occupational Program (ROP), which provided high school students with training for various trades on weekends. I saw welding on the list of trades but had no idea what it was. I asked my counselor about it and she said, "I think you put a helmet on and fire shoots out." I said sign me up! I was not sure what it was. I asked my counselor about it and she said, "I think you put a helmet on and fire shoots out." I said sign me up! I was not sure what welding was when I signed up, but I was hooked the first time I tried it.

*What type of experience and training did you need to get your job?*

Lisa: Because of the ROP training, I was able to start working as a welder right after graduation. After high school, I worked full time and went to college. I built up my field experience while pursuing my college education.

*What advice do you have for young people who are considering this career?*

Lisa: Take as many math, English, and computer classes as you can. They will help you, no matter what type of welding career you choose.

*What do you like most about your job?*

Lisa: Welding educators change lives by equipping and empowering people to achieve fulfilling careers that pay very well. Many of my students tried the corporate world and did not like it but with welding they have found their calling. Another thing I love about my job is that I think of welding as "the second chance profession." At least 10% of my students are certified to do, the more work opportunities there are. The more work opportunities there are.
Sara Bingham  
Age: 19  
Hull technician  
U.S. Navy, Great Lakes, IL.

**COLLEGE:** Uintah Basin Applied Technology College, Vernal, Utah  
**HIGH SCHOOL:** Uintah High School, Vernal, Utah

**Why did you get interested in your career?**
Sara: My dad has a metal recycling business. I’ve been working for him since I was eight years old doing scrap-yard stuff.

**What do you like most about your job?**
Sara: My work takes me all over the world. I never know where I would be stationed, because wherever I’m stationed it is on a ship that goes everywhere.

**What is a typical day like in your job?**
Sara: While I was working in a clothing store then, and I knew I didn’t want to do that forever. So I tried a welding class.

**What kind of training and education did you need to get this job?**
Sara: At technical college I did 600 certified hours of welding and learned lots of different processes. I intended to go to college, but when I spent a week on campus I decided it wasn’t right for me. The military always interested me, just because I wanted to serve. So I sat down with a recruiter, and it became a question of when, not if, I would go.

**What do you like most about your job?**
Tiffany: I’ve never been book smart, but I’ve always been good with my hands. I like crafts. In high school I took auto mechanics and could change a brake drum faster than anyone. Even though my dad and uncle are welders, I never thought of being one.

**How did you get interested in your career?**
Tiffany: It was my grandmother’s idea. She read about the increased demand for welders. At first I dismissed the idea, but I thought of being one.

**Why is your job important?**
Tiffany: It’s good experience because the teams are small, so each person has more responsibility.

**What’s a typical day like in your job?**
Justin: I’m working at a powerplant in Maryland right now. Every morning we start with a safety meeting. There are a lot of hazards on a jobsite, a lot going on. You need to be alert and aware, or you can get hurt. After that, we grab our tools and go do our assignment.

**What do you like most about your job?**
Justin: I work in the shop during the week, but on weekends I’m one of seven people on a nationwide pit crew on the NASCAR circuit. During the week in the shop we rebuild the fleet of cars pretty much from the ground up for the next weekend’s race. We change the engine, service the suspension, fix any damage to the chassis and do any welding or fabrication that’s necessary.

**Why is your job important?**
Justin: Fit stops are a critical part of the race. My performance is important to the team.

**What do you like most about your job?**
Justin: I enlisted for four years, and I have been assigned to Japan, which was one of my top choices. But it really did not matter where I would be stationed, because wherever I’m stationed it is on a ship that goes everywhere.

**What were your future career plans?**
Sara: I enlisted for four years, and I have been assigned to Japan, which was one of my top choices. But it really did not matter where I would be stationed, because wherever I’m stationed it is on a ship that goes everywhere.

**What kind of training and education did you need to get this job?**
Justin: I attended Black River Technical College, Pocahontas, Ark.

**What do you like most about your job?**
Justin: I think a lot of people don’t realize how many everyday things are welded. I didn’t until I started doing it. Now when I go into a restaurant or a store, I’m always noticing the welds everywhere.
**Guillermo Gallardo**  
**Age:** 40  
**President**  
Complete Welding & Cutting Supplies, Pomona, Calif.

**How did you get interested in your career?**  
Guillermo: Right out of high school I started driving trucks for a welding supply company in California. I did that for four years until I broke a finger rolling a cylinder, and then they put me at the counter. Working in the shop made me want to learn more about welding so I enrolled at Riverside Community College. Eventually I worked my way up to store manager and then an opportunity in sales came up. I found out that’s what I do best.

**What is a typical day like in your job?**  
Guillermo: Nothing is built without welding supplies. Even if it’s plastic, it came from a mold, and that has to start with a few moments. Welding is part of every industry. It’s one of the last industries that will ever die.

**What advice do you have for young people who are considering this career?**  
Guillermo: They need to stay focused. For 10 years I was making $10 to $15 an hour. But I was learning. If anyone had told me I would end up owning my own business, I would have worked for free. The experience and knowledge I gained to start my own business was priceless.

**What is a typical day like in your job?**  
Paul: I lead the welding and forming technology group for Boeing, Seattle, Wash. I facilitate new airplane designs and high-performance structures that allow Boeing to make a better airplane. But the work we do here impacts the state of technology across multiple industries and countries. We explore innovations at the leading edge of research. We’re the guys working on new stuff for the future.

**What do you like most about your job?**  
Paul: I enjoy being in the shop and playing with the machines. I’m not stuck behind a desk. I get to work with my hands, apply the fundamentals of science in the real world and see the fruits of my labor.

**What kind of training and education did you need to get this job?**  
Paul: An engineering degree in any field gives you the background you need, but mostly you are learning on the job. I’ve always liked science and math and enjoyed hands-on work—things like shop class in high school and machine class in college. I didn’t know what I would end up doing until I was in the middle of my master’s program and began working with one of my professors on a stir-welding project. Now I’m pursuing a Ph.D. with support from Boeing’s “Learning Together” program, which covers tuition and includes a stipend for books.
1. NASCAR—Long before the rubber hits the road, roughly 950 man-hours are spent on welding and fabrication for each race car. Hundreds of parts are hand-cut, welded and machined, from the chassis and suspension to the drivetrain.

2. In 1961, General Motors installed the first industrial robot in history, the Unimate. Featuring a motorized arm that weighed more than two tons, the Unimate performed spot welds by following step-by-step commands stored on a magnetic drum.

3. Which famous comedian has a large antique car and motorcycle collection and employs welders regularly? Jay Leno! His large collection includes models from the early 1900s to modern vehicles.

4. Explosion welding is a powerful welding process that can accomplish what many other welding methods can’t—it can join nearly every kind of metal together, even the most highly dissimilar ones.

5. Welding in space was first attempted in 1969 by Russian cosmonauts. Today, advances in welding technology have made it essential for projects like the construction of the International Space Station.

6. President Roosevelt, in a letter to Prime Minister Winston Churchill, boasted about the discovery of new welding techniques that enabled America to build ships with a speed unequalled in the history of shipbuilding.

7. The first car made with an entirely plastic body was assembled using ultrasonic welding. Even though plastic cars did not catch on, ultrasonic welding did. Ultrasonic plastic welding is an example of a friction welding process, which creates energy through high-intensity acoustic sounds that cause plastic pieces to vibrate together and form a bond.

8. Did you know that if two pieces of metal touch in space, they become permanently stuck together? This may sound unbelievable, but it is true. Two pieces of metal without any coating on them will form into one piece in the vacuum of space. This doesn’t happen on Earth because the atmosphere puts a layer of oxidized material between the surfaces.

9. More than 95% of U.S. products require welding. Do you know which of the following products rely on welding?
   - Race cars
   - Bridges
   - Ships
   - Medical devices
   - Oil rigs
   - Farm equipment
   - Motor scooters
   - Cell phones
   - MP3 players

   Answer: All of them.

10. What is a “fume plume”? It is the visible column of fume that rises directly from the spot of welding or cutting.

11. The current record for the world’s deepest underwater dry weld, which is carried out in a chamber sealed around the structure to be welded, was set by Global Industries in 1990, at 1,075 ft. deep. But that is only half as deep as the world’s record wet weld, set by the U.S. Navy in 2005, at 2,000 ft. deep. Wet welding is performed underwater, directly exposed to the watery environment.

12. The earliest recorded welds occurred in 3,500 B.C., the Bronze-Age. Pictures of welders and their ancient tools have been discovered in long-sealed Egyptian tombs!
Computers and robots play a big role.

by Pat Toensmeier

THE IMAGE MOST PEOPLE HAVE OF welding is someone in heavy gloves and a mask using an arc torch to join two pieces of metal. But this image, like welding technology, is changing. It won’t be long before new welders enter the field trained to work with computers, lasers and robots rather than gloves, masks and torches.

Welding is becoming very hi-tech. One reason is that the use of specialty metals in more products requires extremely precise welding capabilities. Another is that companies are looking for ways to increase the productivity and quality of welding. The best way to meet these needs is with automated systems.

As the industry adds automation and other technologies, students interested in welding will have the opportunity to learn advanced processes that improve their skills and expand job prospects.

An Edison Welding Institute engineer explains the operation of a gas metal arc welding robot equipped with a laser sensor for accuracy.

friction-stir welding; and robotics. Each requires students to not only learn welding, but also learn how to set up, program and operate high-tech equipment.

“These are automated technologies that require a high level of training,” says Patricio Mendez, director of the Canadian Center for Welding and Joining at the University of Alberta. “These technologies are shifting welding from being entirely a manual skill to one that requires insight and expertise to run sophisticated equipment.”

Hybrid/laser GMAW welds thick pieces of metal rapidly and with greater control than manual welding. These systems use high-power lasers that one expert says are about the size of computer servers. The laser makes a thin cut up to ½ inch deep, liquefying metal as it moves. The GMAW then deposits filler metal (usually wire) in the groove and melts it with a secondary heat source to create the weld. Process benefits include reduced weld distortion, greater retention of base-metal properties and speed.

Friction-stir welding does not melt metal. It generates frictional heat through a rotating tool bit that penetrates, distorts and softens two pieces of metal that are clamped together on a special machine. The pieces almost immediately fuse together when clamping pressure is applied. Friction-stir welds are called autogenous, which means they don’t use filler metal. One advantage of this is no cracking or deformation as the weld solidifies. The weld also has excellent strength and fatigue-resistance.

Robotic welding has been used for years by automakers and others. Robots, usually weld flat surfaces laid out in front of them, which limits their use. Work is underway on software and sensors that will permit robots to weld metal shapes placed at all angles. Mendez and his students for example, are trying to improve computer control of robots to broaden the capabilities of welding automation. “We are trying to invent the machine of tomorrow,” Mendez says of the work. “Welding is incredibly exciting because it combines a bit of everything. Welding offers many possibilities and allows lots of room for creative thinking.”

Resource Guide

Dozens of professional organizations, government Websites and trade unions exist to help you learn more about careers in welding. Here is a sampling of resources to get you started.

American Ceramic Society
(866) 721–3322
www.ceramics.org

American National Standards Institute
(202) 293–0800
wwwansi.org

American Society for Civil Engineers
(800) 548–2723
wwwasce.org

American Society for Nondestructive Testing
(614) 774–6003
wwwasntl.org

American Society for Quality
(800) 245–1946
wwwasq.org

American Society of Mechanical Engineers
(800) 843–2765
wwwasme.org

American Society of Safety Engineers
(847) 699–2929
wwwasse.org

American Water Works Association
(303) 794–7711
wwwawwa.org

American Welding Society
(800) 443–9353
wwwaws.org
wwwcareerinwelding.com
wwwjobsinwelding.com

ASM International
(440) 338–5151
www.asminternational.org

Association for Iron and Steel Technology
(724) 814–3000
wwwainst.org

Edison Welding Institute
(614) 688–5000
wwwewi.org

Fabricators & Manufacturers Association
(815) 899–8775
wwwfmanet.org

Gas and Welding Distributors Association
(215) 564–3484
wwwgawda.org

Institute of Electrical and Electronics Engineers
(800) 848–4313
wwwieee.org

Minerals, Metals & Materials Society
(800) 759–4887
www tms.org

National Association of Manufacturers
(213) 637–3000
wwwnam.org

National Center for Welding Education & Training (Weld-Ed)
(866) 529–9353
wwwweld ed.org
wwweducatorsinwelding.com

National Council for Advanced Manufacturing
(202) 467–1178
wwwncam.org

Plumbing, Heating and Cooling Contractors Assn.
(703) 227–8100
wwwphcweb.org

Society of Automotive Engineers
(713) 766–4781
wwwsaeg.org

Society of Manufacturing Engineers
(813) 271–1500
www sme.org

Society of Naval Architects and Marine Engineers
(212) 798–4800
wwwsiname.org

Society of Petroleum Engineers
(800) 456–6863
wwwspe.org

U.S. Department of Labor Employment & Training Administration
(877) 872–5627
wwwdoletagovwwwcareervoyages.gov

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ASM International
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wwwasminternational.org

International Association of Machinists & Aerospace Workers
(301) 967–4500
wwwiamaw.org

International Brotherhood of Electrical Workers
(202) 833–7000
wwwibew.org

International Brotherhood of Teamsters
(202) 624–6800
wwwteamster.org

International Union of Operating Engineers
(202) 429–9100
wwwiuec.org

International Union of Plumbers, Steamfitters & Pipefitters
(202) 783–5880
wwwsmwia.org

National Association of Manufacturers
(703) 237–8100
wwwnam.org

National Joint Apprenticeship Training Committee
wwwnjatc.org

Sheet Metal Workers’ International Association
(202) 783–5880
wwwsmwia.org

United Auto Workers
(313) 926–5000
wwwuaw.org

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Johnson Space Center’s Robonaut (foreground) performing a mock weld.
Achieving SUCCESS

Tips for Counselors, Parents
Navigating Students toward Welding Careers

TIPS FOR COUNSELORS

High school students today face some difficult choices about what they want to do with their lives. Amid this information overload, professional counselors can steer students toward careers they may have overlooked. As a career expert, you can point out the benefits of a future in the growing field of welding.

From spaceships to bridges to nanotechnology, welding is an essential part of the structure of our world. A new generation of skilled technicians will be required in the future. You can help fill that need by pointing students in the direction of a rewarding career at all training levels.

Right Fit

The welding industry has something to offer to just about every student. Some may be drawn to the precision of a nanotechnology career. Others may like the adventure of an underwater welding job. Work locations are as varied as the projects. Welders are on location at military bases, at space centers, on construction sites and in university labs, hospitals and auto shops. A growing number of graduates enter the field building cell phones and computers. You can help future metalworkers decide whether one of the myriad of welding jobs would be a good career fit by asking a series of lifestyle questions like the ones on the U.S. Department of Education’s Prepare for My Future Website (www.ed.gov/students/prep/college/consumerinfo/index.html). This is a great place to check out college options to determine what fits a student’s financial, family and career goals.

Another free online Career Personality Assessment is offered by Fun-Education (www.funeducation.com). Students rate for accuracy a series of 485 questions such as “Am I the life of the party?” The whole process takes about an hour, and the resulting report gives a range of jobs that may fit the student’s personality type.

Asking questions about workplace, salary, along with hobbies and interests, can start a conversation about a career in welding. You can help bridge the gap between possibilities and reality by showing the things they are already doing in their spare time—jewelry making, auto repair or odd construction jobs—that could lead to a profitable career and help them balance their dreams of family, home and stability.

Resources


Along with the other resources in this guide, you may want to visit the U.S. Department of Labor Career Voyages Website (www.careervoyages.gov). The Career Changers section is a valuable tool to show students that welders, cutters, solderers and brazers are considered an in-demand occupation. This site is also home to the Career Myths brochure, in the Career Advisors section, which can be a valuable resource in educating students about the opportunities available to them. For instance, one of the myths busted is “No one will hire me because I lack experience, have low grades, and have gaps in my work history.” The Occupational Outlook Quarterly encourages students to not only find ways to overcome these challenges, it lays out strategies for informational interviewing to get to the next level.

The U.S. Department of Labor also sponsors www.careeronestop.org, a snapshot of jobs, salaries and search tips that can help paint an accurate picture of life as a welder.

These resources will allow students to make informed decisions about which of the many welding careers may fit their educational and lifestyle goals. Once you show them what is out there, watch the sparks fly.

TIPS FOR PARENTS

Did your child build elaborate castles out of blocks as a toddler? Did he glue the remote control to the television? Does she like to work on cars? These may be signs your child has a natural instinct for welding. Welders understand that by joining things together, they are creating more useful products.

Sharing the Dream

The earlier teens start thinking about what kind of career they would enjoy, the better off they’ll be. Just because they change aspirations every six months doesn’t mean they aren’t dedicated. They are trying on different possibilities to find the right fit. You can help in this process by asking questions and guiding them to resources that will give them answers.

The U.S. Department of Education’s Think College Website (www.ed.gov/students/prep/college/thinkcollege/edit-lite-index.html) can help. It includes basic questions about desired education levels, sources of funding for higher education and tips for picking the right school.

Another way to spend a productive afternoon is at the Vocational Information Center Welding and Metalworking Career Guide (www.khake.com/page9.html). You will find career descriptions, skill requirements, schools and job-market statistics. Or cruise over to Careers in Welding (www.careersewelding.com) for a sampling of the jobs available.

You can also help your teen get a part-time job or internship. Even if it is unpaid volunteer work, it will help prepare him or her for college and narrow the choices.

Encourage your teen to think big. Opportunities abound regardless of financial background. The AWS Foundation can make dreams reality thanks to a number of scholarships and fellowships offered each year. You can learn more at www.aws.org/wa/foundation/index.html.

Get Personal

Share your career choices with your teens. Talk about what you do, how you got to where you are and your goals for the future. Take your child to see where you work and why you get up in the morning. You can do this through the national Take Our Daughters and Sons to Work Day (www.dauthersandsonstowork.org) or on your own, informally. Use the experience as an opportunity to ask questions. What do they think about the prospect of doing something similar? What would be more interesting? What are their income and lifestyle goals? What is realistic?

Do you have an interesting career in construction? Volunteer to speak in your teen’s classroom or at a career day. Who knows, it just may get you fired up about going to work tomorrow.

Encourage your teens to do the best they can regardless of their educational goals. Whether their future includes college or technical school will depend on the individual student but make sure they get a high school diploma. Counsel your student to take as many courses in math and science as possible. If your child hasn’t caught the “math is fun” bug yet, try finding a summer math camp at www.ams.org/employment/mathcamps.html or check out www.sciserv.org. Math and science skills will help them in work and everyday life. Teach them to speak and write effectively. Regardless of their career choice, the ability to communicate is essential in today’s world.
TIPS FOR TEACHERS

Teachers can play a vital role in showing students the many opportunities welding opens. An emphasis on collaboration and logical thinking can give students the basic skills needed to pursue a variety of careers. Additional classroom exercises focused on building, following directions and working as a team can also lay a strong foundation.

Regardless of which aspect of the welding industry attracts a student, a grounding in math and science is a great foundation. Employers also value communication, so a well-rounded education can help your students succeed whether they are fabricating medical devices or communications satellites. Shop classes, of course, can be a practical way to open the door to a welding career. For more ideas and resources, check out www.educatorsinwelding.com. It is a great tool for educators and counselors to get additional information on careers in welding, network with fellow educators, and get curriculum and recruiting resources.

Bring a Welder to the Classroom
You can bring the vague idea of a welding career to life by inviting guest speakers from local companies to share stories from their daily lives. Look to local manufacturers, or construction companies for possible speakers. Job fairs and career days are opportunities for local welders to share their passion. Internships for teachers can also give you real-world experience. When you come back to class with stories about things you made, it will fire kids up to find a meaningful career. Internships for teachers can also give you real-world experience. When you come back to class with stories about things you made, it will fire kids up to find a meaningful career.

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IDEAS FOR TEACHERS

A great way to make the idea of a welding career real is to have students create a “dream job” classified ad. After they use the Websites listed in this section, ask them to do some research about welding jobs that fit their interests. Then turn the responses into an ad that fits their skills and career goals perfectly.

1. What activities do you like to do? Are they done mostly indoors or outdoors? (Welding workplaces vary from being underwater or at the peak of a skyscraper to an automobile manufacturing plant or the laboratory of a technology campus.)
2. What are your favorite school subjects and activities? (Students who have a firm grasp of math, science and communication would do well in a welding career.)
3. Do you enjoy working on projects alone or with a large group? (Welders can take pride in their contribution to the team effort of building a bridge or the artistry of creating a unique sculpture on their own.)
4. What job holds the most interest for you at this time? (What have you learned about welding through your research?)
5. Where do you want to live when you enter the workforce? (Unlike many other careers, welding jobs are available in all states.)

ADAPTED FROM ORIGINAL EXERCISE IN EDUCATION WORLD, WWW.EDUCATIONS-WORLD.COM

Surf the Web
Tell parents they can find lots of career information at the National Center for Welding Education and Training, at www.weld-ed.org. This site provides access to:
- Different types of careers.
- The knowledge and skills needed to enter these careers.
- Information about education and training opportunities needed to prepare for a chosen career.

Another good place to browse with your teen is the American Welding Society’s website, www.aws.org.
WELDING CROSSWORD

Now that you have learned about welding and all the exciting opportunities it offers, let's test your knowledge!

Visit www.careersinwelding.com for the answers of this puzzle.