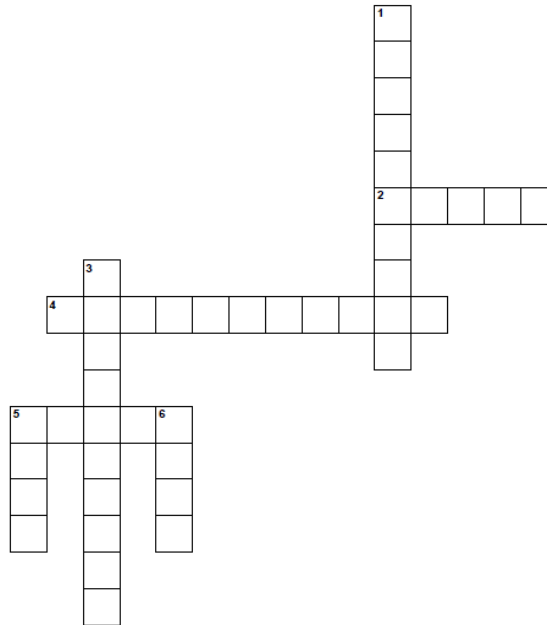


## WELDING PRINCIPLES

### 4.1. Vocabulary

*Ex. 1. Solve the crossword puzzle.*



#### Across

[2] a thick stick with material that burns tied to the top of it, used to give light

[4] a substance that makes something less pure or makes it poisonous

[5] a stream of hot, burning gas from something on fire

#### Down

[1] a small change

[3] being suitable or right for each other

[5] to join together physically, or to join things together physically

[6] the outer or furthest point of something

*Ex. 2. Complete the sentences with the given words:*

**contaminants, adjustment, compatible, bead, torch (2), fuse, flame, MIG-welding, edge, parent metal, mild, filler**

The welder made a precise \_\_\_\_\_(1) to ensure the proper settings for the job.

Before beginning the welding process, the technician checked for any \_\_\_\_\_(2) on the metal surface.

It's crucial to use \_\_\_\_\_(3) materials when welding to achieve a strong bond.

He demonstrated his expertise in \_\_\_\_\_(4) by creating seamless joints.

Holding the \_\_\_\_\_(5) steady is essential for achieving a clean and accurate weld.

The \_\_\_\_\_(6) from the welding \_\_\_\_\_(7) was bright and intense, melting the metals together.

When working with \_\_\_\_\_(8) steel, it's important to follow the specific welding guidelines.

After completing the weld, a smooth \_\_\_\_\_(9) formed along the edge of the joint.

The \_\_\_\_\_(10) provided a solid foundation for the weld to adhere to.

Choosing the right \_\_\_\_\_(11) metal is essential for ensuring a strong and durable weld.

She carefully aligned the two pieces of metal to create a seamless \_\_\_\_\_(12) before welding.

As the metals melted together, they began to \_\_\_\_\_(13) into a single, unified piece.

## **4.2. Reading**

*Ex. 1. Read the text.*

### **Welding Principles**

Welding is a process that joins two materials, usually metals, by causing their atoms to combine at the joint. Welding is different from other processes that join materials such as gluing or soldering because in welding, the original materials are melted at the joint and then cooled so that they form a single solid piece.

The basic principles of welding have been known for thousands of years. The earliest evidence of welding comes from the Bronze Age when gold boxes were made by pressure welding lap joints together. In the Middle Ages, blacksmiths used forge welding to join iron and steel by heating

them in a fire until they were red hot and then hammering them together. Today, there are many different methods of welding, but all of them use heat to melt the materials being joined.

The most common type of welding is arc welding. In arc welding, an electric current is passed through an electrode (a metal wire) and an inert gas called a shielding gas flows out of the nozzle of a torch to protect the weld area from oxidation. The heat generated by the electric current melts the end of the electrode and the surface of the metal being welded. As the molten materials cool, they fuse together to form a strong bond. Arc welding can be done with or without the use of a filler material, depending on the specific application.

Another common type of welding is resistance welding. In resistance welding, two pieces of metal are pressed together and an electric current is passed through them. The resistance to the flow of electricity causes the metal to heat up and melt at the joint. Resistance welding is often used in the automotive industry to join sheet metal parts together.

Welding is an essential process in many industries, including construction, manufacturing, and transportation. It is used to build everything from bridges and buildings to cars and airplanes. Welders play a critical role in these industries, using their skills and expertise to create strong, durable, and high-quality welds.

***Ex. 2. Answer the questions.***

1. How does welding differ from other processes that join materials like gluing or soldering?
2. What are the basic principles of welding and how long have they been known?
3. Can you explain the process of arc welding and the role of the shielding gas?
4. What is resistance welding and how does it work?
5. In what industries is welding an essential process and why?
6. How has welding evolved over time from ancient methods to modern techniques?

7. Why are welders considered critical in industries such as construction, manufacturing, and transportation?

### **4.3. Communication**

*Ex. 1. Make sentences using the following words:*

1. joining/metal/pieces
2. Heat/melt/metal
3. welding/safety/equipment
4. protective/gear/injuries
5. tools/welding/torches
6. welding/machine/essential
7. skilled/welders/create
8. welding/common/technique
9. challenging/rewarding/process
10. learning/weld/takes