Fayette Business Education Partnership

2018 Future Fayette Workforce
Teacher in the Workplace Program

LESSON PLANS

Lesson Plan Title: Welding in Manufacturing

General Information

Author: Nate White

Email: nwhite@fayettecti.org

Subject(s): Welding

Topic: Welding in Manufacturing

Grade-Level(s): 10th,11th,12th

Partner Company: Gerome MFG, Hranec Corp.

Summary: This lesson will inform the students of the possibilities they have to further themselves in their welding career, through the manufacturing industry. One of the hurtles students may face is the simple fact that they are just unaware of what is around them and their opportunities.

Resources: STEMjobs.com, catalyst connections videos from website

Alignment to PA Standards for Career Education and Work

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Desired Results

Established Goals:
What relevant goals will this lesson address?
The students will be able to identify what they are learning here at the CTI in regards of welding and be able to apply that knowledge and skill into a manufacturing specific career. Other goals of this lesson will have site specific relevance, such as GMAW on thin gauge steel. Hranec Corp is a manufacturing company that builds and produces HVAC ductwork for industrial and commercial applications. Their main substrate is 18 gauge galvanized steel, I believe basing this lesson around the needs of the companies will be beneficial to both the students and the

company. One of the goals is to demonstrate how to weld 18gauge steel and then have the students practice welding on the same material.

Overarching Understandings:
What are the big ideas?

The big ideas will be to get the students to understand what type of welding processes are being used in manufacturing and also how to adapt what the students already know to what customers may want. In this case the owner of Hranecs voiced concern that students may not be getting exposed to welding on thin gauge material in welding programs. I as an instructor can somewhat agree, the type of material they are using would be more found in an auto body or sheet metal class. This will be a great opportunity for the students to demonstrate what they have learned in theory about controlling heat for thinner materials and actually applying that knowledge.

What misunderstandings are predictable?

Misunderstanding that may be predictable, are that everything in manufacturing will be automated and that there is no need for hands on welders.

Essential Question(s):
What provocative question will foster inquiry, understanding, and transfer of learning.

The question that I will ask my students is, “What stands you apart from other applicants to the same job you want?” In this Lesson I will test their skills and challenge them to be the best they can be while doing something they have little to know experience with. They will find out quickly that material thickness is a major concern for welders and will determine the level of skill they really have. It will be a great learning experience for both the students and myself.

Knowledge:
What key knowledge will students acquire as a result of this unit?

The key knowledge I hope the students will take away from this unit is, the knowledge to adapt and apply skills they have learned to situations they come across. As a welding class of mostly 10^{th} and 11^{th} graders, they do not get much experience with thin gauge material. Being able to adapt to material thickness and adjust their parameters and heat will be very beneficial to the students in the work force. Also once the students have mastered this technique we will be able to show the students that they have just opened up a door of opportunity at Hranec’s Corp.

Skills:
What key skills will students acquire as a result of this unit?

Skills the students will acquire from this lesson will be the ability to recognize material thickness, set up welding parameters, and perform the correct welding technique to meet the standards set by a certain customer. This will be a great lesson for students to understand that in the real world they may be faced with challenges such as (material thickness) that they will need to overcome and be able to come up with a solution using knowledge they have gained.

Assessment Evidence

Performance Task:
Through what authentic performance task(s) will students demonstrate the desired understandings?

I am hoping to receive material from Hranec Corp, the exact material they use and provide that to students. The students will be performing GMAW on an outside corner joint on 18-gauge steel. The students will be evaluated on the profile, penetration, and lack of burn through of the weld. We will have a theory lesson covering some obstacles they may face while performing the weld and then go out into the shop for a demonstration, afterword's they will be tackling the weld on their own.

By what criteria will performances be judged?

Other Evidence:
Through what other evidence (e.g., quizzes, tests, academic prompts, observations, homework, journals, etc.) will students demonstrate achievement of the desired results?

The students will be judged on their welds and the ability to weld on thin gauge material along with setting up the parameters of the welders themselves to achieve the desired weld.

How will students reflect upon and self-assess their learning?

Once the students have practiced, they will be given opportunity to make their best weld. Once the students have made their weld we will take the welds into the classroom to evaluate as a group to determine what may be changed to kept the same to achieve their goal to produce the perfect weld

Lesson outline/activities (1-3 days)

Launch: Day one- Theory on GMAW and parameters to be set up while welding on thin gauge material. After the theory lesson we will go out into the shop for a demonstration that I will perform on the same material the students will be welding on along with the same machines they will be using.

Explore: Students will be given pieces of the material and a welding machine, using the correct PPE students will set up and perform welding on 18-gauge steel using GMAW on an outside corner joint configuration.

Summarize: Once students have practiced and make what they believe to be their best welds, we will go into the classroom to evaluate them to determine how they can be better. At this time we will also summarize on why we are covering this lesson and the opportunities the students have in manufacturing that they may not have known about in their own backyards of Fayette County.