

‘degrees that work, Welding and Fabrication’

Lesson Planning Guide – Technology Education Version

Unit: Technological Devices / High Tech Careers

Competency: Evaluate a personal career in welding.

PA Academic Standards Included: 3.6.8C; 3.7.8A, B; 13.1.8A, B

Approximate Time: Two to three 45-minute periods.

Prerequisite Skills

Reading, Writing, Speaking and Listening*

1.4.8 Types of Writing

B. Write multi-paragraph information pieces.

1.6.8 Speaking and Listening

E. Participate in small and large group discussions and presentations.

1.8.8 Research

B. Locate information using appropriate sources and strategies.

C. Organize, summarize and present the main ideas from research.

Mathematics*

None

Science and Technology*

3.6.10 Technology Education

C. Apply physical technologies of structural design, analysis and engineering, personal relations, financial affairs, structural production, marketing, research and design to real world problems.

3.7.10 Technological Devices

A. Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.

B. Apply appropriate instruments and apparatus to examine a variety of objects and processes.

* Academic Standards, Pennsylvania Department of Education
<http://www.pde.state.pa.us>

Career Education and Work*

13.1.8 Career Awareness and Preparation

- A. Relate careers to individual interests, abilities, and aptitudes.
- B. Relate careers to personal interests, abilities, and aptitudes.

Performance Standards

Performance Standard	Suggested Evaluation Method
1. In a report, explain why a career in welding could become a part of your career plan with 90% accuracy on the rubric. Focus on welding technology, personal interests, abilities and career goals to complete the report.	Product evaluation - rubric

Suggested Projects

None

Multiple Intelligence Types

Verbal/Linguistic
Visual/Spatial
Bodily/Kinesthetic
Interpersonal

Resources

1. Display Packet – Welding Related Materials
Teacher developed
2. Video - Degrees That Work: Welding and Fabrication
<http://www.pct.edu/degreesthatwork/>
3. Handout - Overview of Video- Degrees That Work: Welding and Fabrication
See attached
4. Handout - Welding Technology
<http://www.pct.edu/schools/iet/weld/>
5. Worksheet - Careers
See attached
6. Website – Weld-Ed
<http://www.weld-ed.org/>
7. Website – Sciences in a Weld
<http://www.welding.org/popup.aspx?src=images/Product/large/348.jpg>

* Academic Standards, Pennsylvania Department of Education
<http://www.pde.state.pa.us>

8. Website – Welding Around the World
<http://www.weldinghistory.org/whistoryfolder/welding/index.html>
9. Rubric – Pennsylvania Writing Assessment Domain Scoring Guide
<http://www.cheltenham.org/sdct/lib/sdct/Rubric.pdf>

Equipment/Materials/Software

1. Soldering iron, solder, flux, supplies
 Any supplier
2. Oxyacetylene torch, plasma cutter
 Any supplier
3. DC or MIG welder
 Any supplier
4. Metal supplies
 Any supplier
5. Safety glasses, dark welding curtain
 Any supplier

Suggested Learning Sequence

Strategy	Outline	Resources/Equipment
Performance Standard 1		
Introduction	Preceding the lesson, display posters and structural examples about welding. Include in the display local, state and national classified job listings and yellow page advertisements of welding fabricators and suppliers. Make sure students observe and read the display.	Resource #1
Demonstration	Assemble the class in the shop for a short presentation on soft soldering, heating metal with an oxyacetylene torch and stick welding. Have students observe all safety rules during the presentation. Allow students the opportunity to try their hand at the demonstrated skills. Have a question and answer period at the conclusion. Related Academic Skills: 3.6.10C; 3.7.10A, B Related SCANS/Soft Skills: Information A; Technology B	Equipment #1 Equipment #2 Equipment #3 Equipment #4 Equipment #5
Presentation	Review with the class the bulletin board display and welding demonstration. Highlight the following: <ul style="list-style-type: none"> • careers in welding • local job listings • Do you know someone who is a welder? • Could you be a welder? 	Resource #1

* Academic Standards, Pennsylvania Department of Education
<http://www.pde.state.pa.us>

	<p>Continue the presentation about welding:</p> <ul style="list-style-type: none"> • history time line • definition • metallurgy • careers 	
Activity	<p>As a class, show the video “Degrees That Work- Welding and Fabrication.” Talk to them about what academic skills it would take to be a good welder and how welding could fit into a student’s career plan:</p> <ul style="list-style-type: none"> • oral and written communication skills • math • science <p>Give each student an overview sheet. Have them follow it as a guide during the video presentation. At the end of the video talk with them about welding as a career and what types of training are available:</p> <ul style="list-style-type: none"> • Apprenticeship • Certificate • Associate degree • B.S. degree • Military 	<p>Resource #2 Resource #3 Resource #4</p>
Activity	<p>Have students work in pairs, using at least three sources, to complete a worksheet on careers in welding:</p> <ul style="list-style-type: none"> • demonstration • bulletin board • internet • handouts-overview • posters • examples • careers <p>Have each team discuss their findings with the class. "Careers in welding" is the topic for each team. Related Academic Skills: 1.6.8E; 1.8.8B,C Related SCAN/Soft Skills: Information A</p>	<p>Resource #5 Resource #6 Resource #7 Resource #8</p>
Assessment	<p>Have each student write a one page report about welding as a career. Have them explain why or why not they could select welding as a career. Make certain they focus on their individual and personal interests and abilities. Evaluate the reports on the information and correlations using the PSSA scoring rubric for written pieces. Related Academic Skills: 1.4.8B; 13.1.8A, B Related Scan/Soft Skills: Thinking Skills B</p>	<p>Resource #9</p>

Related SCANS/Soft Skills

Resources

None

Interpersonal

None

Information

A. Acquires and Evaluates Information

Systems

None

Technology

B. Applies Technology to Task

Thinking Skills

B. Decision Making

Personal Qualities

None

Related Worksite/Work Based Activities

None

Additional Resources

None

This planning guide was written by Robert Tule, Former Technology Transfer Teacher, Muncy, PA.

Degrees That Work: Welding Overview – Terms

Mike Patterson, Artist/Welding Instructor

- plasma cutter
- oxyacetylene torch
- safety
- the perfect weld
- calculates
- grinding
- colors of stainless steel
- pride in work

Jennifer Brinkley-Cruz, Manufacturing Specialist for Toyota

- robotic welding
- new car every 53 seconds
- 2,800 of 7,000 workers in body weld
- plant secretary
- 6% women in welding (168)

David Cotner, Welding Instructor

Martin Denault, Welding Technology Student

Fabtech, International/American Welding Society

- young people need to replace older workers
- high growth and wages
- \$20.00 per hour/\$41,000.00 per year

Worksheet: Careers

List schools of instruction for welding. (5)

State at least five reasons why you might become a welder.

List welding careers found in the D.O.T. or other internet sites.

What is a non-traditional occupation?

List the heat ranges for:

- | | | |
|----------------------------|----------|-------------|
| • soft soldering _____ | 10,000° | 400° - 600° |
| • welding _____ | 100,000° | 50,000° |
| • oxyacetylene torch _____ | 98.6° | 6,000° |