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Explore Welding Career Pathways

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Agenda

- About Realityworks
- Building Pathways in Welding Education
- Programs Designed with Generation Z in Mind
- The Importance of Welding Education
- Q&A

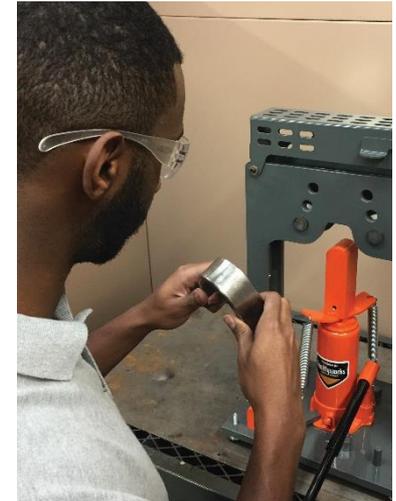
Realityworks

- **Distribution into education**
 - **62%** of school districts in the U.S.
 - **90** countries worldwide
 - **31,000** institutions
 - **6,000,000** students served through the use of our products
- **Education partner**
 - Association for Career and Technical Education Board
 - Chair of Industry Workforce Needs Coalition (IWNC)
 - 100+ education trade shows (local, state, national)
- **Educational focus**
 - Hardware, software, learning aids & curriculum development

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Innovative Learning Tools for Skills Training

FACS | Health Sciences | Agriculture | Welding and Trade Skills



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Building Pathways in Welding Education

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Common Career Technical Core Standards

The process for developing the CCTC was informed by:

- High-quality state and industry standards
- Input and guidance from educators, business and industry and state leaders
- Feedback from the public

<https://careertech.org/cctc>

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Building your Plan of Study

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/ or Degree Major Courses for Agriculture, Food and Natural Resources	SAMPLE Occupations Relating to This Career Cluster	
Interest Inventory Administered and Plan of Study Initiated for all Learners									
SECONDARY	9	English/ Language Arts I	Algebra I	Earth or Environmental Science	State History Civics	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students.	Introduction to Agriculture, Food and Natural Resources: This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers and Cluster Foundation Knowledge and Skills. This may be taught as a career exploration course in conjunction with other foundation Career Cluster courses.	Occupations Requiring Postsecondary Education <ul style="list-style-type: none"> ► Agricultural Chemical Dealer ► Agriculturalist 	
	10	English/ Language Arts II	Geometry	Biology	U.S. History				
	11	English/ Language Arts III	Algebra II or other math course	Dependent on chosen pathway	World History				
College Placement Assessments/Academic/Career Advisement Provided									
POST-SECONDARY	12	English/ Language Arts IV	Dependent on chosen pathway	Dependent on chosen pathway				<ul style="list-style-type: none"> ► Farm Manager ► Health and Safety Sanitarian ► Meat Cutter-Meat Grader ► Park Manager ► Produce Buyer ► Recycling Technician ► Wildlife Manager 	
	Articulation/Dual Credit Transferred-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.								
	Year 13	English Composition	Algebra	Dependent on chosen pathway	American Government		All plans of study need to meet learner's career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	Continue courses pertinent to the pathway selected.	Occupations Requiring Baccalaureate Degree <ul style="list-style-type: none"> ► Agricultural Educator ► Botanist ► Ecologist ► Environmental Engineer ► Fish and Game Officer ► Plant Pathologist ► Veterinarian
	Year 14	Speech/ Oral Communication	Dependent on chosen pathway	Dependent on chosen pathway	American History Geography				
	Year 15	Technical Writing	Statistics	Dependent on chosen pathway	Dependent on chosen pathway				
Year 16	Continue courses in the area of specialization.								

All plans of study should meet local and state high school graduation requirements and requirements. Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students.

Introduction to Agriculture, Food and Natural Resources: This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers and Cluster Foundation Knowledge and Skills. This may be taught as a career exploration course in conjunction with other foundation Career Cluster courses.

High school

Post-Secondary

All plans of study need to meet learner's career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.

Continue courses pertinent to the pathway selected.

Build an Advisory Council

- Invite 5-10 industry professionals to participate in an advisory council
- Meet several times per year
- Focus on outcomes – what are employers looking for?
- Are you teaching the right things?
- Form partnerships for field experience, job-shadowing, guest speaker opportunities

Seek Industry-Recognized Certifications

- Does your state dep. recommend a specific certification or testing agency?
- Are your instructors licensed to teach the courses if that is required?
- What are local employers looking for?
- Is employment transferable?
- What is the cost of certification or a specific credential?



Formula for Skill Focused Engagement

Skill Development

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graph TD; A[Skill Development] --> B[Skill Refinement]; B --> C[Skill Performance]; C --> D[Skill Sharing];
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Skill Refinement

Skill Performance

Skill Sharing

Formula

Engagement

Skill Development

- Create tangible ways to develop understanding of concepts
- Practice and learn key systems and technique development

Critical Thinking

Skill Refinement

- Enhance skill through rigorous assessment and experiences
- Gain best practices and industry standard learning

Creative Thinking

Skill Performance

- Personalize and individualize learning
- Modify to individual strengths and talents

Collaboration

Skill Sharing

- Strong peer to peer communication and career exploration
- Learn from sharing best practices and innovative findings

Communication

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Programs Designed with Generation Z in Mind

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The Face of CTE: Who are our Students?



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Generation Z

- Born between 1995 and 2010
- Tech savvy
 - Multitasking
 - 8 second attention span



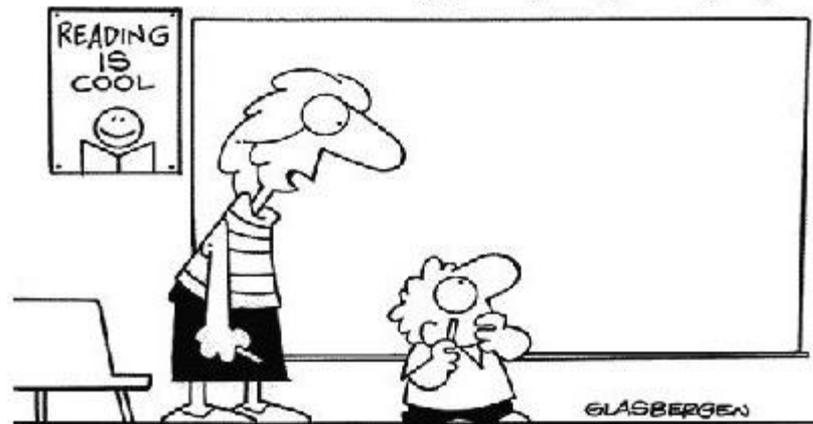
It's about the Experience

- Students read less than 20% of text
- Future focused
 - Where will I use this in real life?



Teaching Generation Z

- Keep content small
- Information across multiple modalities
- Be flexible



"There aren't any icons to click. It's a chalk board."

What would your ideal
WELDING PROGRAM
look like?

How They View Educators?

- No longer experts
- Facilitators or guides



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Welding Program Checklist

FACILITY:

Educating students + Training students

Classroom:

For instruction. Computers? Projector?
Screen?

Equipment:

Welding booths with welders (Stick, MIG)
exhaust, helmets, welding guns, tables,
wire, gas.....



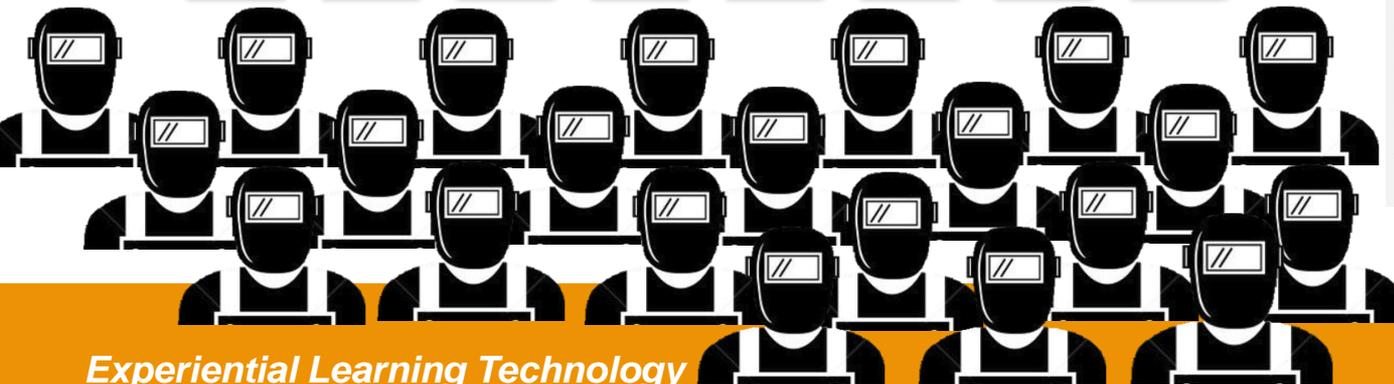
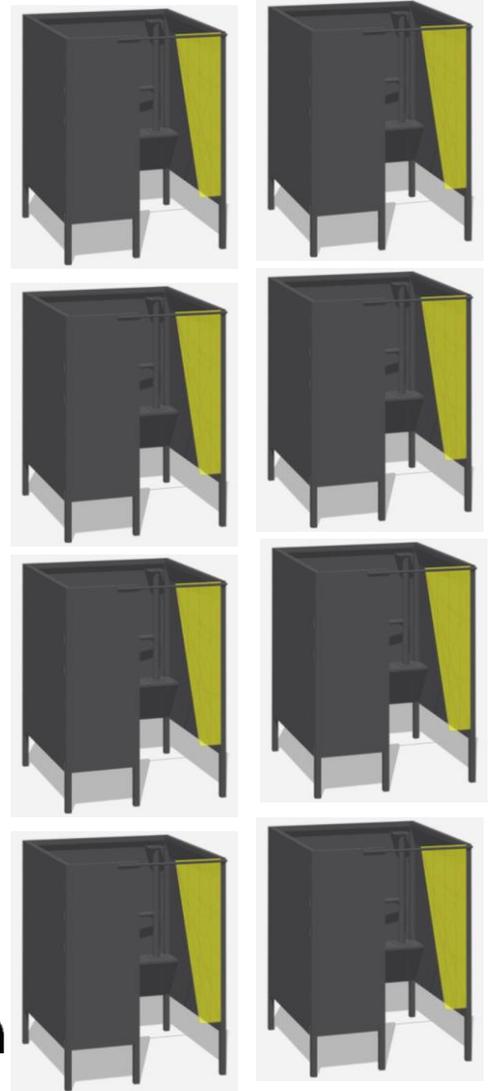
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Today's High School Welding Lab

8 – number of welding booths on average per high school

22 – average number of students per welding class

33 – percentage of students with cognitive disabilities



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The 21st Century Welding Classroom

Realityworks' Welding Solutions feature several powerful and cost-effective welding education tools to help train welders more efficiently and engage students in welding career exploration.

Classroom Management

Portable Workstations - Large & Small

Destructive Weld Testing

RealCareer™ Bend Tester

Welding Simulation Lab

guideWELD® VR welding simulators

Live Welding Booths

guideWELD® LIVE real welding guidance system

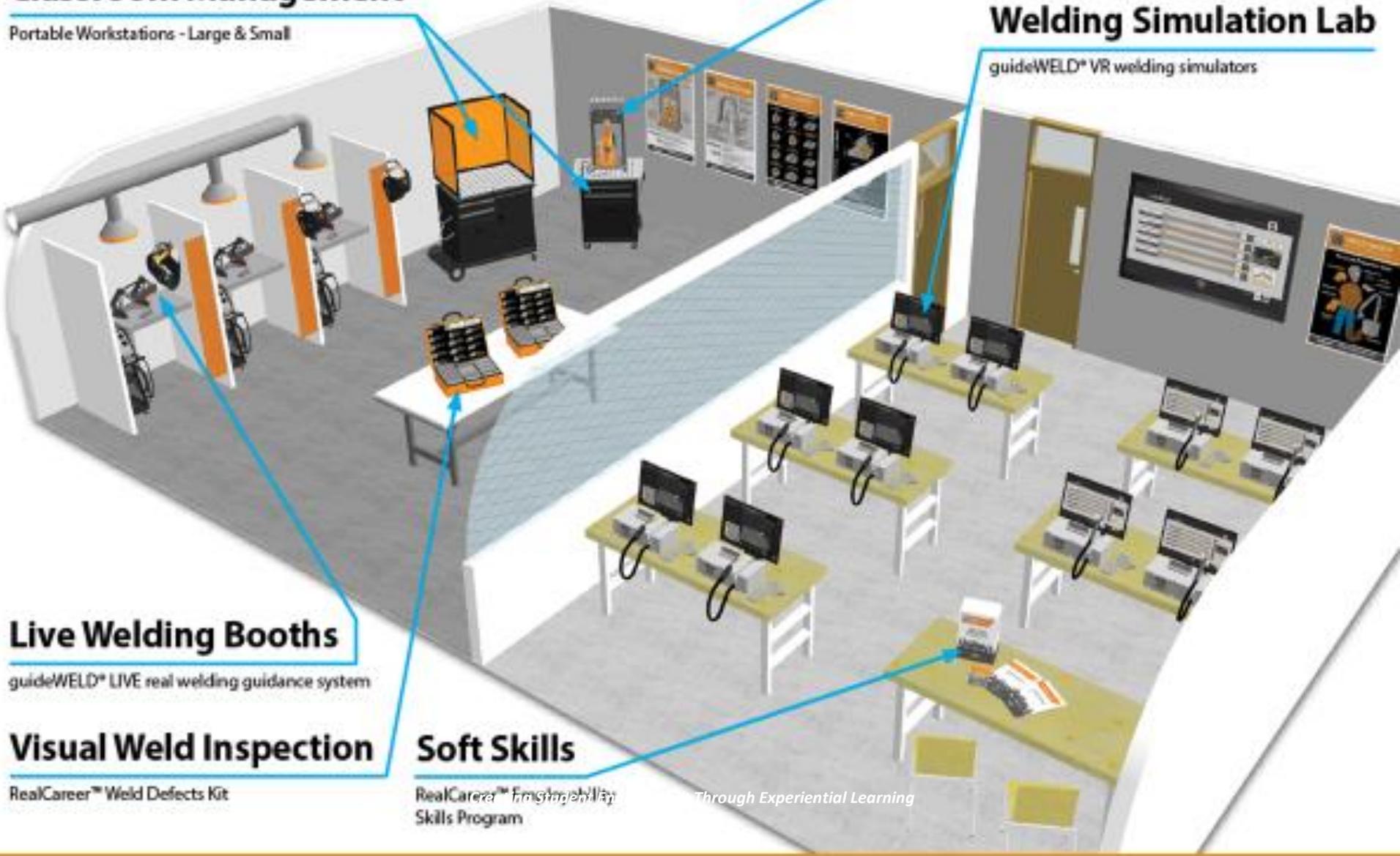
Visual Weld Inspection

RealCareer™ Weld Defects Kit

Soft Skills

RealCareer™ Employment Skills Program

Through Experiential Learning



SKILL DEVELOPMENT

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Welding Simulation Lab

guideWELD® VR welding simulator

- Explore careers, foundational learning, provide more arc time
- A safe, cost-effective way to teach welding fundamentals

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guideWELD^{VR}

Virtual Reality Welding

- Technique guidance
- Technique assessments
- GMAW & SMAW available
- Teacher customizable
- Local install / no licenses



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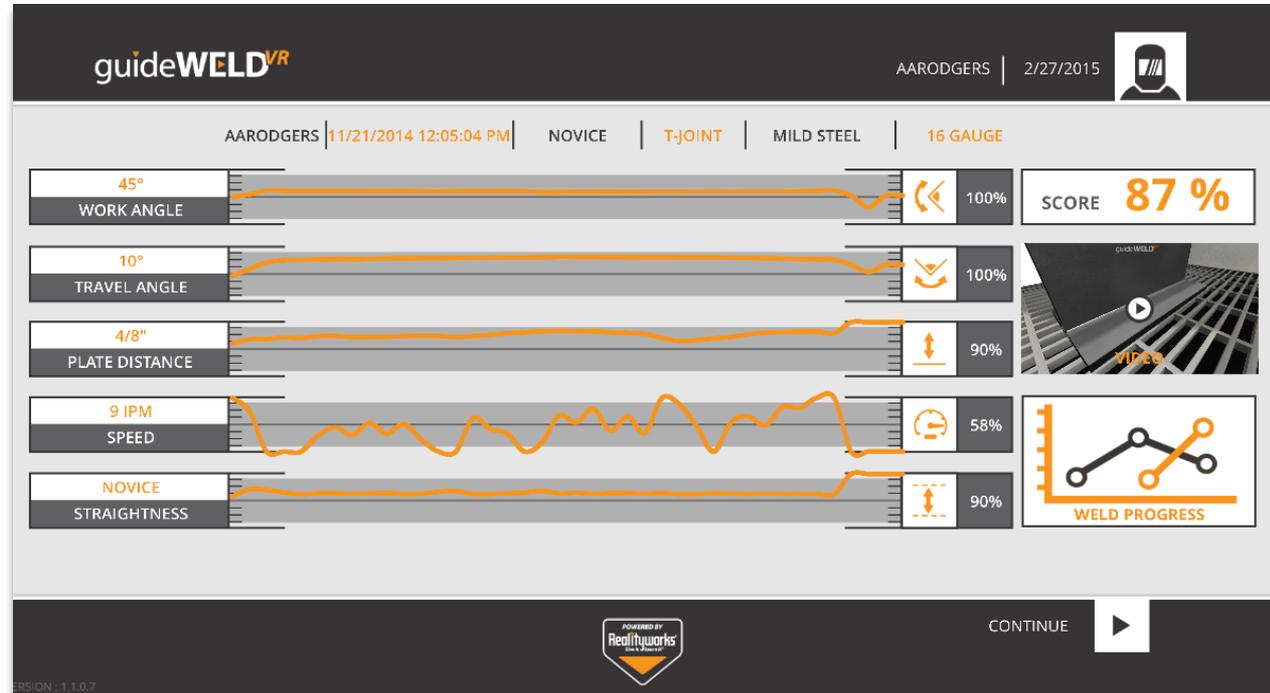
	16 IPM SPEED
	10° TRAVEL ANGLE
	45° WORK ANGLE
	3/8" NOZZLE PLATE
	NOVICE STRAIGHTNESS
	PUSH PUSH/PULL



com

Assessment

- Tracks work angle, travel angle, plate distance, speed and straightness
- Overall score given as a percentage
- Graphs student progress



Virtual Reality Integrated Weld Training

Study shows VR welding:

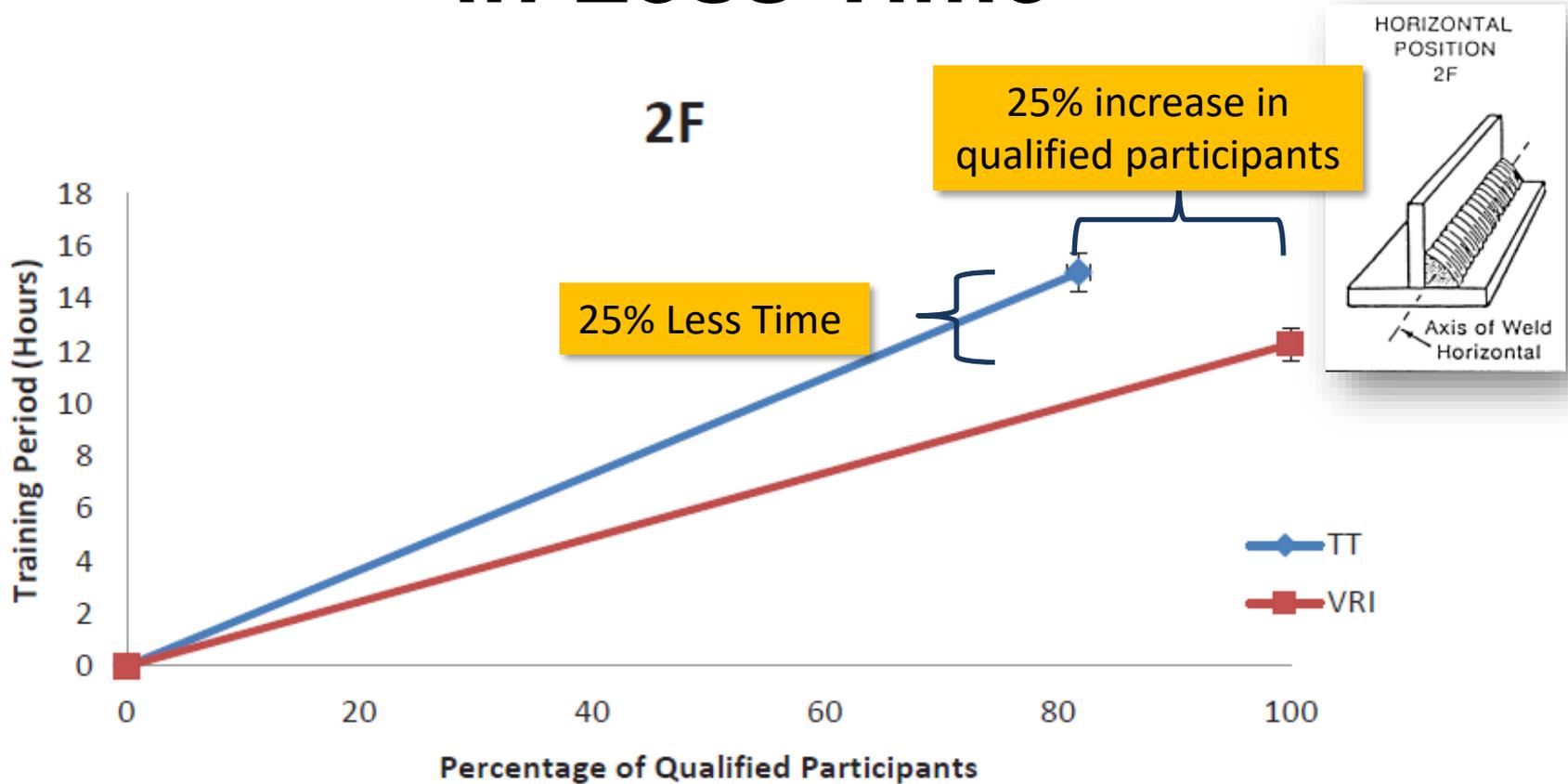
- *Increases* learning of welding techniques
- *Increases* ability of student to create qualified welds
- *Increases* understanding of proper welding
- *Reduces* amount of time needed to do quality welds
- *Reduces* costs of material for welding training

Virtual Reality Integrated Weld Training
A scientific evaluation of training potential, cost effectiveness and implication for effective team learning

Richard T. Stone^{1,2}, Kristopher Watts¹, Peihan Zhong¹
¹Department of Industrial and Manufacturing Systems Engineering, ²Department of Mechanical Engineering, Iowa State University

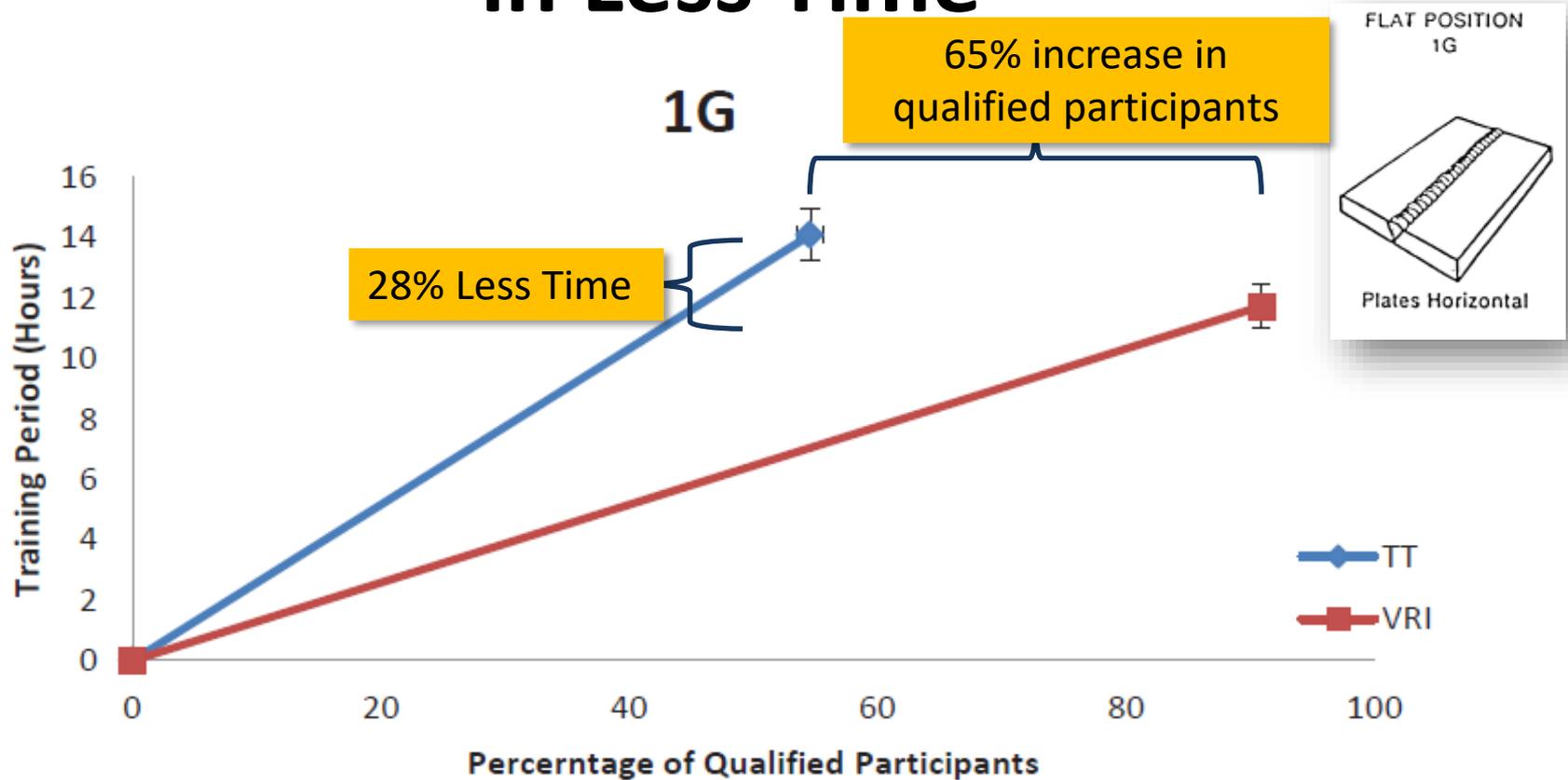
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Simulators Create More Welders in Less Time



1. Stone, R., Watts, K., Zhong, P., & Wei, C. (2011). Physical and cognitive effects of virtual reality integrated training. *Human Factors*, 53(5), 558-587. Retrieved from <http://connection.ebscohost.com/c/articles/66816988/physical-cognitive-effects-virtual-reality-integrated-training>

Simulators Create More Welders in Less Time



1. Stone, R., Watts, K., Zhong, P., & Wei, C. (2011). Physical and cognitive effects of virtual reality integrated training. *Human Factors*, 53(5), 558-587. Retrieved from <http://connection.ebscohost.com/c/articles/66816988/physical-cognitive-effects-virtual-reality-integrated-training>

...And With Less Cost

*“welding simulation has decreased our consumable and welding costs by about **70%** for our program.”*

George Karr,
Welding and Technology Instructor
Hollenstein Career & Technology Center, Fort Worth, TX

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SKILL REFINEMENT

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Live Welding Booths

guideWELD® LIVE real welding guidance system

- Corrective guides, immediate feedback, classroom management
- A one-of-a-kind solution for guidance inside the welding helmet during live welding

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guideWELD[®] LIVE

- Real time corrective feedback in every welding booth for MIG & STICK
- Feedback comes from 9 default WPS's with customization available
- Guidance on proper technique
 - Work Angle
 - Travel Angle
 - Speed



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guideWELD[®] LIVE

- guideWELD LIVE is NOT a simulator
 - Actual welding helmet used while live welding
 - Trains during a weld how to consistently have proper Work Angle, Travel Angle, and correct welding Speed
- Auto-darkening Helmet, Hand Sensor & Speed Sensor work together to give feedback on proper welding technique
- Improves Welding Technique development and increases welder confidence



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*Creating Student Engagement Through
Experiential Learning Tools*

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SKILL PERFORMANCE

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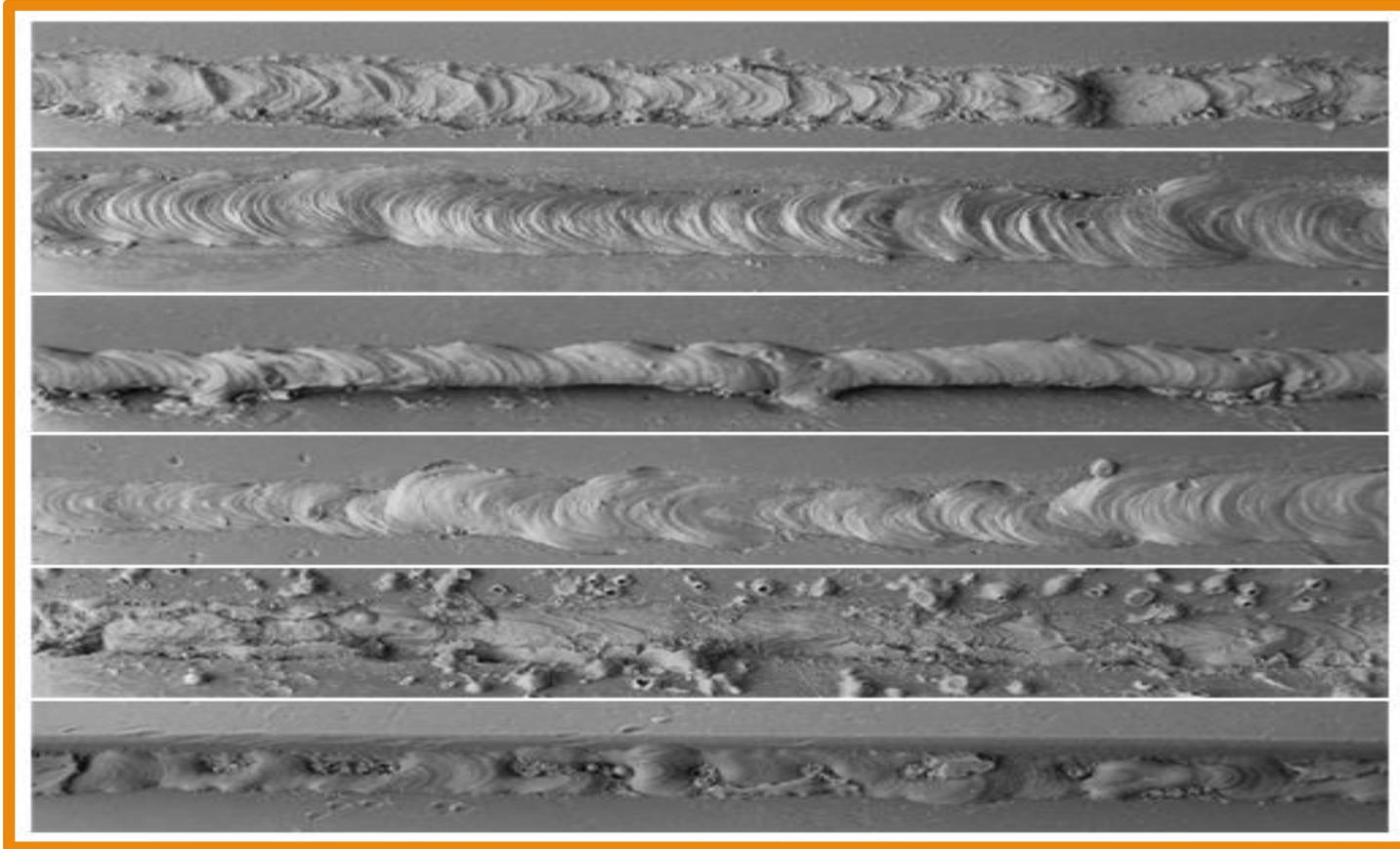
Visual Weld Inspection

RealCareer™ Weld Defects Kit

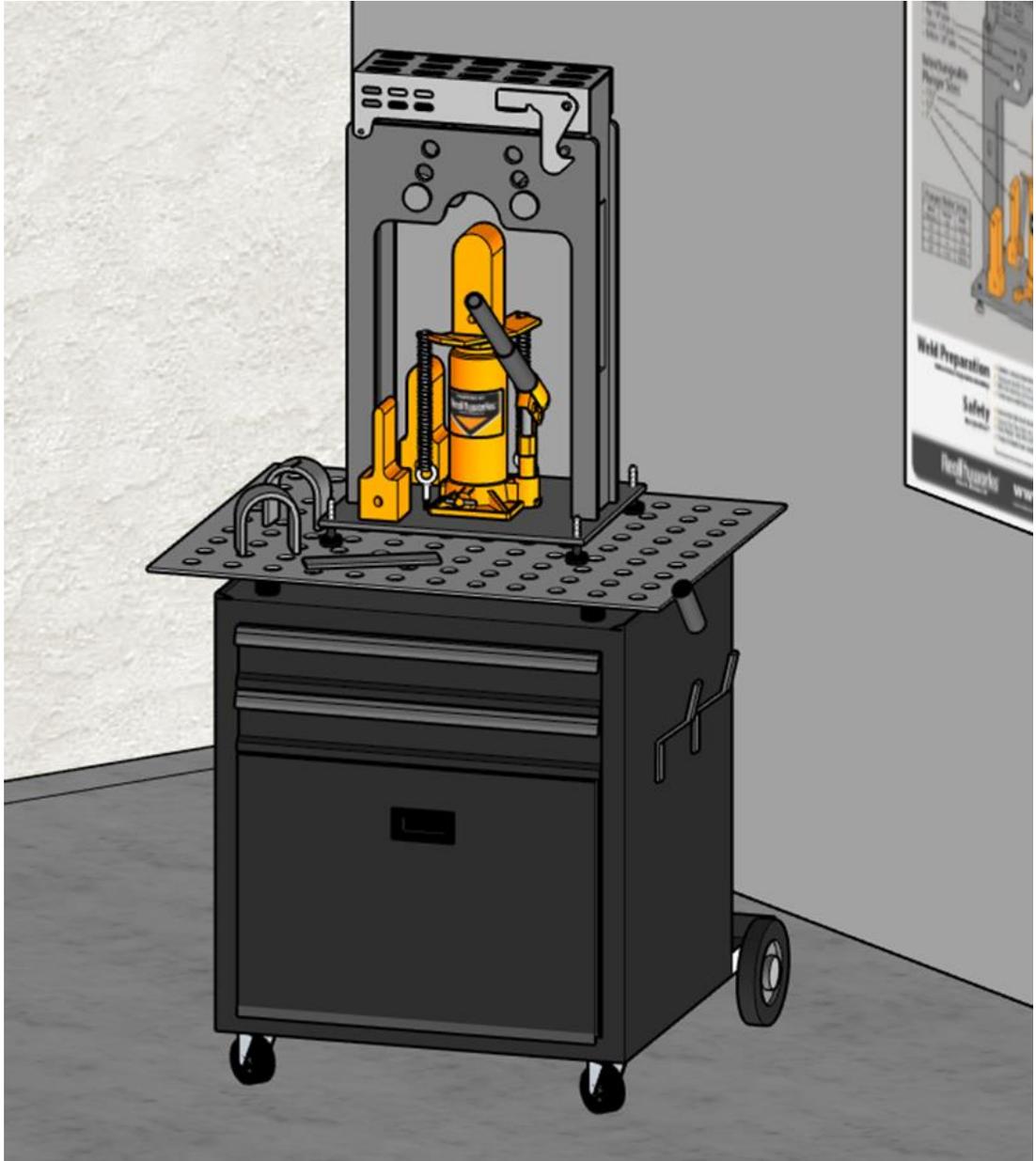
- Assessment and correction techniques, quality inspection
- An instructional aid to teach weld defects and discontinuities

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RealCareer™ Weld Defects Kit



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Destructive Weld Testing

RealCareer™ Bend Tester

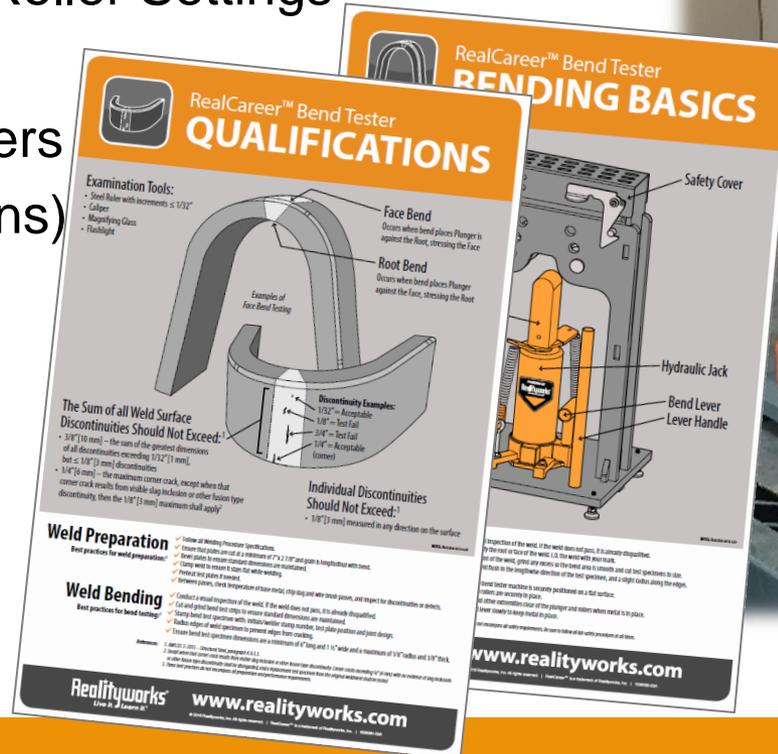
- Prepare for careers, self-assessment
- Challenge students to test their own welds and determine what went wrong

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RealCareer™ Bend Tester

Product Includes:

- Guided Bend Tester Complies with AWS D1.1 code
- 3 plunger sizes & 3 Roller Settings
 - ½, 1, 1 ½ inch
- 2 Bend Testing Posters
- Curriculum (8 Lessons)
- 8-ton jack
- 1 year warranty



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SKILL SHARING

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Portable Workstations

Product Includes:

- Convenient storage includes locking cabinet drawers
- Tough, grated work surface, removable for easy cleaning
- Durable wheels for easy maneuvering



detachable welding screen

48" W x 24" D x 39" H

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Don't Forget the Soft Skills!

- Empathy
- Communication
- Teamwork
- Dealing With Pressure
- Strong Work Ethic
- Positive Mental Attitude
- Flexibility
- Time Management
- Self-Confidence
- Dealing With Criticism



RealCareer™ Employability Skills

Product includes:

- A complete unit on employability skills
- 19 Lessons include focus on:
 - Problem Solving
 - Time Management
 - Interviews
 - Self-Confidence
 - Stress Management
- Includes:
 - Teacher Guide & Scenario
 - 20 Student Workbooks



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The 21st Century Welding Classroom

Realityworks' Welding Solutions feature several powerful and cost-effective welding education tools to help train welders more efficiently and engage students in welding career exploration.

Classroom Management

Portable Workstations - Large & Small

Destructive Weld Testing

RealCareer™ Bend Tester

Welding Simulation Lab

guideWELD® VR welding simulators

Live Welding Booths

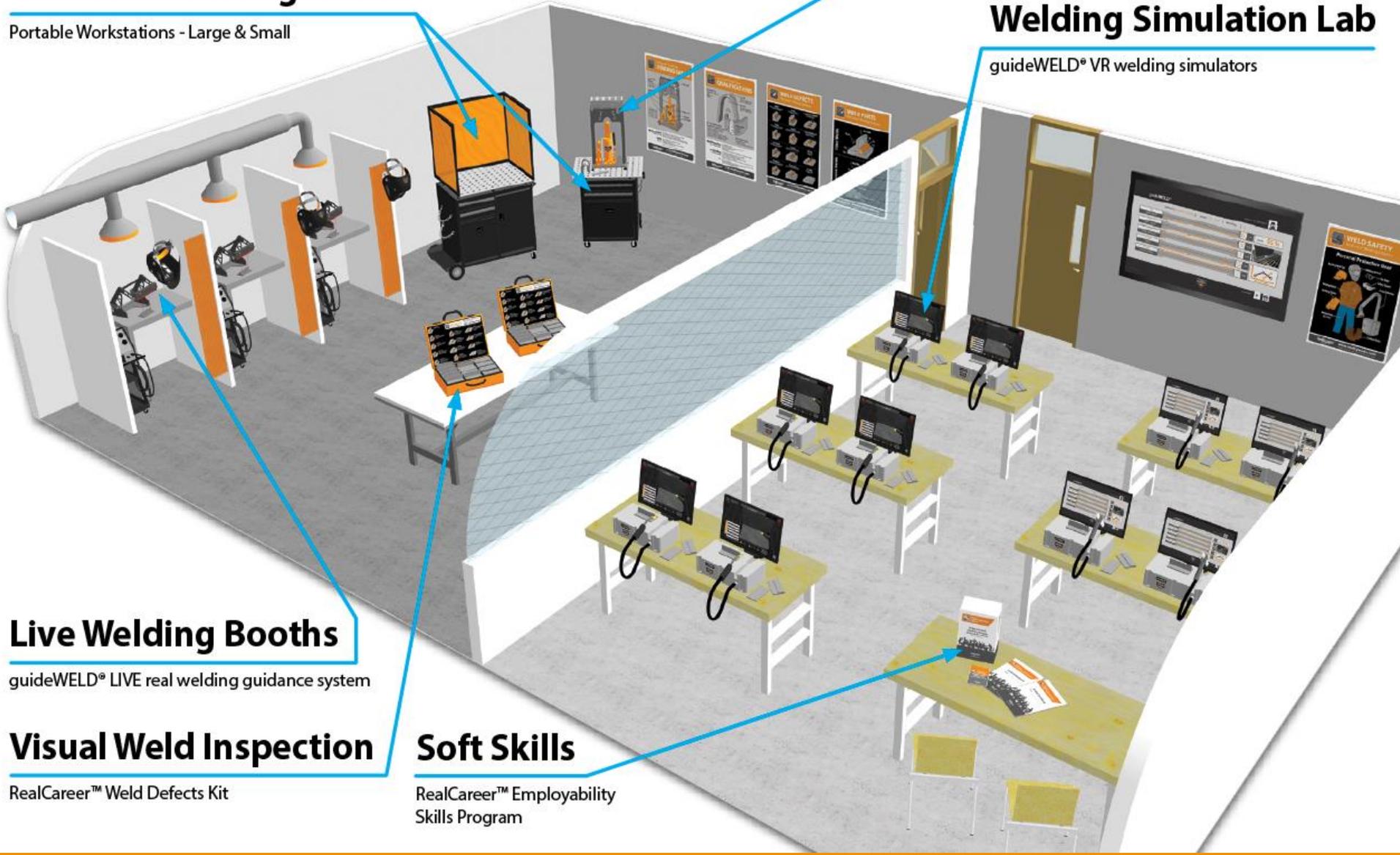
guideWELD® LIVE real welding guidance system

Visual Weld Inspection

RealCareer™ Weld Defects Kit

Soft Skills

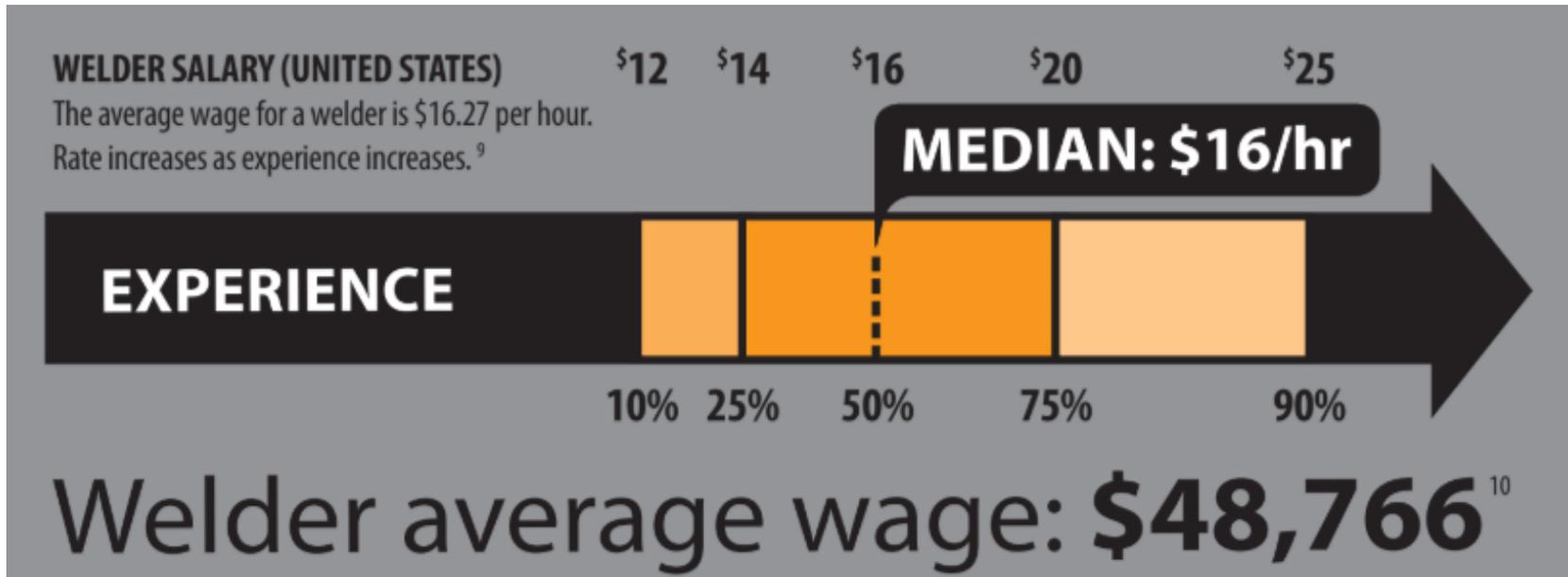
RealCareer™ Employability Skills Program



The Importance of Welding Education

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Welding Careers



The 90th Percentile of welders earn \$57,000 per year

The Need for Welders

By *2025* there will be a need for *400,000* replacement and new welding professionals.

Today, welders are retiring at *2x* the pace of welders who are coming into the job field.



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Ways Our Tools Help CTE

Brings you hands on learning training into your Classroom

- More students with welding arc time
- Skill development and training time increase
- Reduces classroom management issues
- Welders can become competent and qualified quicker

Add Time & Learning Opportunities to your Classroom

- More students with welding arc time
- Skill development and training time increase
- Reduces classroom management issues
- Reduce costs of disposable products with durable and reusable aids

Ease of Use in the Classroom

- Student-centric learning aids
- Curriculum and Teacher Guides help to bring new resources to the development of student learning
- Engaging and academic curriculum to enhance any class lesson

Curriculum Paired with Hands-On Learning Aids

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Pathway Packages



- Gather your resources
- Fill out your Plan of Study
- Round it out with curriculum and hands-on learning aids

Welding Curriculum Overview

Experiential Learning Tool	guideWELD® VR			guideWELD® LIVE			RealCareer™ Weld Defects Kit	RealCareer™ Bend Tester	RealCareer® Welding Career Exploration
Length	20- to 30-hour curriculum			20- to 30-hour curriculum			Up to 10-hour curriculum	Up to 15-hour curriculum	Up to 14-hour curriculum
Focus	Welding Careers, Types of Welding and Welding Safety	Welding Equipment, Basics and Defects	Introduction to Welding Simulation	Welding Careers, Types of Welding and Welding Safety	Welding Defects and Correction	Welding Testing and Welding Procedure Specifications	Welding Defects	Bend Test Qualification	Welding Related Careers
Units	Unit 1	Unit 2	Unit 3	Unit 1	Unit 2	Unit 3	Unit 1	Unit 1	Unit 1
Lessons	6	6	1	6	6	4	5	8	6
Presentation Slides	147	168		137	96	79	145	167	
Lesson Topics	Welding Career Opportunities	Welding Equipment (2 Part Lesson)	Intro to Welding Simulation	Welding Career Opportunities	Basics to Quality Welds	Weld Testing	Welding Safety - PPE	Welding Safety - PPE	Careers in Manufacturing and Production Welding
	Types of Welding	Weld Defects		Types of Welding	Identifying Defects	Reading a WPS	Types of Welding	Parts of a WPS	Career Opportunities in Welding Fabrication
	Welding Safety - PPE	Welding Basics (2 Part Lesson)		Welding Safety - PPE	Multiple Causes of Defects	Testing and WPS Activity	Welding Basics and Techniques	Reading a WPS	A Day in the Life of a Welding Engineer
	Welding Safety Focus (2 Part Lesson)	Welding Basics Assessment		Welding Safety Focus (2 Part Lesson)	Defects Assessment	Weld Testing and WPS Assessment	Welding Defects	Nondestructive and Destructive Testing	Exploring a Career in Welding Quality Assurance or as a Certified Welding Inspector (CWI)
	Safety Review, Assessment, Certification			Safety Review, Assessment, Certification			Weld Testing	Prepare to Weld for a Bend Test Qualification	Looking into a Career as a Pipe Welder
							Welding Review and Assessment	Welding a Qualification Test	Exploration of Other Welding Related Careers
								Preparing to Bend and Examining a Bend for Qualification	
								Welding Career Opportunities	

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Manufacturing Pathway Package

Our Manufacturing Package includes:

19 hands-on resources:*

- 5 guideWELD VR welding simulators with MIG & Stick welding guns
- 1 guideWELD LIVE real welding guidance system
- 1 Weld Defects Kit
- 1 Bend Tester
- 2 Electrical Wiring Kits
- 8 additional Electrical Wiring Kit Wall Panels
- 1 Employability Skills Classroom Set

Up to 80 hours of course content that addresses topics such as:

- Career exploration
- Employability skills
- Electrical and welding safety
- Welding basics and techniques
- Welding defects

Plus activities and assessment tools for each hands-on resource.

<https://www.realityworks.com/pathwaypackages>

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Manufacturing



Up to 80 hours
of content

Curriculum Topics:

- Career exploration
- Employability skills
- Electrical and welding safety
- Welding basics and techniques
- Welding defects
- Destructive and non-destructive testing for welding
- Basic wiring skills

Hands-On Learning Aids:

- guideWELD VR welding simulators with MIG & Stick welding guns
- guideWELD LIVE real welding guidance system
- Weld Defects Kit
- Bend Tester
- Electrical Wiring Kits
- Employability Skills Classroom Set

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Power, Structure and Technical Systems

Up to 60 hours
of content

Curriculum Topics:

- Career exploration
- Employability skills
- Welding technique basics
- Welding safety
- Setting up a welding machine
- Welding defects
- Destructive and non-destructive testing for welding
- Electrical safety and principals
- Basic wiring skills

Hands-On Learning Aids:

- guideWELD VR welding simulators
- guideWELD LIVE real welding guidance system
- Weld Defects Kit
- Electrical Wiring Kits
- Employability Skills Program Classroom Set

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Questions?

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For more information please contact Realityworks, Inc.
through email at information@realityworks.com
or call toll free at 800.830.1416

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