



# Construction Career Pathway

Preparing secondary students for  
careers in Construction through  
Regional Career Pathways

# Education Building Blocks

## PURPOSE

The purpose of **Educational Building Blocks** is to give secondary educators guidance on the skills and competencies that will prepare their students for careers in construction.

Education Building Blocks are not fully developed curriculum and lessons, **nor are they a replacement for state education standards in Construction and other content areas**. Rather, they should be used as guidelines that reference the skills and competencies that employers are looking for in a particular industry. These guidelines should inform you as you develop curriculum aligned to state standards.

Education Building Blocks are comprised of four groups of skills:

- \*Employability Skills
- \*Digital Literacy Skills
- \*Academic Skills
- \*Technical Skills

The combination of these sets of skills comprise the necessary learning to prepare students to be future ready to transition to adulthood prepared for college AND careers in the construction sector.

“Connecting industry with education has created an incredibly valuable product for educators to use so they can best prepare students for these important and in demand careers”

Elizabeth Roddy  
Associated Builders &  
Contractors of Wisconsin

## PROCESS

Groups of employers and employer professional associations (Appendix C) have gathered to develop this document in order to provide secondary educators with a current picture of skill sets desired in a particular high skill, high demand industry sector. Their input has been collated into this guidance document for use in regional career pathway development in secondary settings.

Once defined, the **State-Endorsed Career Pathway outline (page 9-10)** was developed showing the career ladder progression, as well as the desired industry-recognized credentials and education needed to advance to different levels in the industry sector.

The State-Endorsed Career Pathway outline is adopted into a **Regional Map** by Regional Councils of higher education and public agency partners to leverage their local resources for implementation. Regional Councils must address barriers to access, as well as connect secondary students directly to available work-based learning experiences, dual credit (high school and college) course opportunities, and local district course offerings. This “ready-made Academic and Career Plan (ACP)” highlights to students the series of activities for those interested in the career sector. Regional Maps, adopted by the local school, can be used with students and families in ACP planning and advising.

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## SKILL SETS

All Regional Career Pathways require districts to identify a sequence of courses that students will take in order to complete the secondary pathway. The specific courses may vary from district to district. However, every district's sequence of courses should reflect Education Building Block learning for the pathway. This ensures a consistent approach to the skills and competencies that are being developed while providing local flexibility in delivery.

### Employability Skills

Often referred to as "Soft" skills, the source for the Employability Skills Set in the Education Building Blocks is the Wisconsin Department of Public Instruction's (DPI) Employability Skill Standards (Appendix A). Furthermore, because employers are also seeking job candidates that are able to think and act innovatively, it is also recommended to reference the Innovation Learning Outcomes (Appendix A) as part of this learning. Although this skill set was originally created for future entrepreneurs, it provides suggestions to prepare students to become innovation leaders with an entrepreneurial mindset.

### Digital Literacy Skills

Today's job market requires some level of digital literacy. Therefore, it is essential to include digital literacy skills in every Education Building Block model. For our purpose, Digital Literacy Skills are defined by DPI's Information and Technology Standards for Digital Literacy (Appendix B).

### Academic Skills

Academic Skills are clearly defined by states in standards which act as benchmarks of quality and excellence in education. The Wisconsin Academic Standards (Appendix C) specify what students should know and be able to do in the classroom. Setting high standards enables students, parents, educators, and citizens to know what students should have learned at a given point in time. State standards serve as a model. Locally elected school boards adopt academic standards in each subject to best serve their local community. Educational Building Blocks point to specific groups of academic skills that employer partners have indicated are critical to their industry.

### Technical Skills

Often referred to as "Hard" Skills, employers recognize that developing basic occupational skills in secondary settings allows students to apply academic learning in unique and contextualized ways. Employers identify specific technical skills in the Educational Building Blocks that should be developed for anyone interested in pursuing a career in the this area.

"The solution is to pursue initiatives that instill both hard skills and soft skills into the available workforce, not settle for one at the expense of the other."

Matt Kirchner, Lab Midwest

# Education Building Blocks

## BLOCK 1

### Employability Skills

Appendix A

- Employability Skill Standards
- Innovation Learning Outcomes

## BLOCK 2

### Digital Literacy Skills

Appendix B

- Standards for Information and Technology Literacy

## BLOCK 3: ACADEMIC SKILLS

### Math Concepts

- Identify whole numbers and demonstrate how to calculate with them mathematically.
- Explain how to calculate with fractions.
- Describe the decimal system and explain how to calculate using decimals.
- Identify various tools used to measure and show how they are used.
- Identify and convert units of length, weight, volume, and temperature between the imperial and metric systems of measurement.
- Identify basic angles and geometric shapes and explain how to calculate their area and volume.
- Calculate using basic trigonometry.

### Science Concepts

#### Basic

- Mechanical reasoning
- Problem solving
- Interpreting data
- Graph reading

#### Physical Science and Applied Physics

- General principles of forces (Laws, Inertia)
- Force and power dynamics (i.e. horsepower, leverage and pull)
- Simple machines
- Types of Energy (Thermal, Geothermal, Electrical, Mechanical, Solar)
- Thermodynamics

#### Environmental Science and Applied Chemistry

- Effects of wind and heat on construction materials
- Soil Sciences
- Environmental Impacts to materials: Water, Weather, Wind, Temperature
- Measuring environmental data
- Materials science

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## BLOCK 3: ACADEMIC SKILLS

### Communication

- Describe the listening process and identify good listening skills.
- Describe the speaking process and identify good speaking skills.
- Describe job-related reading requirements and identify good reading skills.
- Describe job-related writing requirements and identify good writing skills.
- Describe the difference between academic and technical writing, as applied to: Contracts, Cost estimates, Working with supply companies

### Other Recommended Coursework

- Spanish
- Algebra
- Geometry
- Applied Physics
- Trigonometry (for students planning to be a carpenter or electrician)
- Environmental Science



## BLOCK 4: TECHNICAL SKILLS– CAREERS

### Be prepared for a Construction Career.

For an individual to reach the Construction Industry workforce ready they must have a basic understanding of the disciplines that underpin success, including:

- Customer service skills needed in the construction industry
- Following directions and plans
- Teamwork: Identify roles and responsibilities of individual members as part of the construction team

Successful construction professionals like activities that includes practical, hands-on problems and solutions.

#### They do well at:

- Solving problems and thinking critically
- Dealing with conflict
- Paying attention to detail
- Taking criticism
- Positive attitude
- Active listening
- Working on a team
- Managing projects and time
- Thinking spatially (3D)
- Punctuality

#### Successful construction professionals possess characteristics such as:

- Manual dexterity and multilimb coordination
- Precision
- Desire to be creative and work with your hands
- Mechanical aptitude
- Good physical condition– lifting, core strength
- Not afraid of heights or working in extreme weather conditions
- Persistence
- Desire to continually learn
- Understand cultural differences
- Good eyesight

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## BLOCK 4: TECHNICAL SKILLS- CAREERS

### **Apply safety principles.**

- Describe the importance of safety, the causes of workplace incidents, and the process of hazard recognition and control.
- Describe the safe work requirements for elevated work, including fall protection guidelines.
- Identify and explain how to avoid struck-by and caught-in-between hazards.
- Identify common energy-related hazards and explain how to avoid them.
- Identify and describe the proper use of personal protective equipment.
- Identify and describe other specific job-site safety hazards.

### **Wisconsin K12 Technology & Engineering Academic & Technical Standards:**

[https://dpi.wi.gov/sites/default/files/imce/cte/pdf/TE\\_Section\\_IV.pdf](https://dpi.wi.gov/sites/default/files/imce/cte/pdf/TE_Section_IV.pdf)

## BLOCK 5: TECHNICAL SKILLS- INDUSTRY

### **Understand the Industry.**

- Describe the opportunities in the construction business and how to enter the construction workforce, as applied to (but not limited to): Boilermaker, Bricklayer, Carpenter, Electrician, Heavy Equipment Operator/Operating Engineer, Iron Worker, Plumber, Sheet Metal Worker/HVAC, Steamfitter/HVAC.
- Understand construction management roles for: Leadership, Project Management, Safety & Risk Management, Accounting & Finance, Marketing & Business Development, Equipment Management, Human Resources.
- Demonstrate the impact of financial, technical, environmental, political, societal, and labor trends on the past and the future of the construction industry.
- Identify and describe construction industry settings: Civil, Residential, Commercial or Industrial
- Analyze construction requirements, materials, structures, techniques and maintenance.
- Demonstrate the variety of building phases, systems and techniques used in construction.
- Understand and describe the bidding process: Estimating, Costing, Surveying.

### **Understand and read Construction Drawings.**

- Identify various types of construction drawings.
- Identify and describe the purpose of the five basic construction drawing components.
- Identify and explain the significance of various drawing elements, such as lines of construction, symbols, and grid lines.
- Identify and explain the use of dimensions and various drawing scales.
- Identify and describe how to use engineer's and architect's scales.

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## BLOCK 6: TECHNICAL SKILLS– TECHNOLOGY

### Know the tools and technologies in the Industry.

- Describe Global Position System (GPS) and Navigation
- Identify and explain how to use construction industry related software, such as: Building Information Modeling and its applications, such as Revit
- Computer Aided Design and its applications, such as Sketchup
- Identify and explain how to use various types of tools: Hand tools, Measurement and Layout tools, Cutting and Shaping tools.
- Demonstrate safe and appropriate use of power tools common to the construction industry: Drills and Impact wrenches, Power saws, Grinders and Grinder Attachments, etc.

## BLOCK 7: TEACHING CONSTRUCTION PATHWAY

Construction concepts are taught at all grade levels by classroom teachers. Elementary and middle school education serve as the foundational background to advanced study in high school technology and engineering pathways courses. Connect employer recommendations in this document to [Wisconsin's Technology & Engineering Academic and Technical Standards](https://dpi.wi.gov/sites/default/files/imce/cte/pdf/te_standards.pdf) at: [https://dpi.wi.gov/sites/default/files/imce/cte/pdf/te\\_standards.pdf](https://dpi.wi.gov/sites/default/files/imce/cte/pdf/te_standards.pdf) Pages 57-103.

### Elementary

- Construction Career Awareness
- Use of hand tools & materials
- Energy Systems– Renewable, Non-renewable, Green
- Measuring & using data
- Early hands on projects in woodworking, modeling, designing, metal craft, and robotics can spark interest in construction careers.



### Middle School

- Technology & Engineering career options and exploration courses
- Control systems & mechanisms
- Electricity & electronic systems
- Measuring, Materials, & Structures

At this level, it is essential to expose students to a variety of technical careers through the Academic & Career Planning (ACP) process in the school.

Experiences could include:

- ◇ Career Fairs
- ◇ Guest Speakers
- ◇ Company Tours

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### High School

As students move through the Academic and Career Planning (ACP) process into high school, identify those interested in pursuing a career in construction. Counselors and advisors should help these students create an ACP plan that is developed from the [published State-Endorsed Regional Career Pathway](#) plan, which includes:

- an appropriate sequence of courses,
- industry recommended certifications,
- related dual credit courses, and
- related work-based learning experiences



#### Standards specific to this Pathway in Technology and Engineering (TE):

##### Foundational (Broad-Based BB)

- BB1.a. Analyze and use technological systems.
- BB1.b. Analyze and use tools and materials.
- BB1.c. Analyze and use mechanisms.
- BB1.d. Analyze and use electricity and electronic systems.
- BB1.e. Analyze, explain and use control systems.
- BB1.f. Identify and analyze structures.

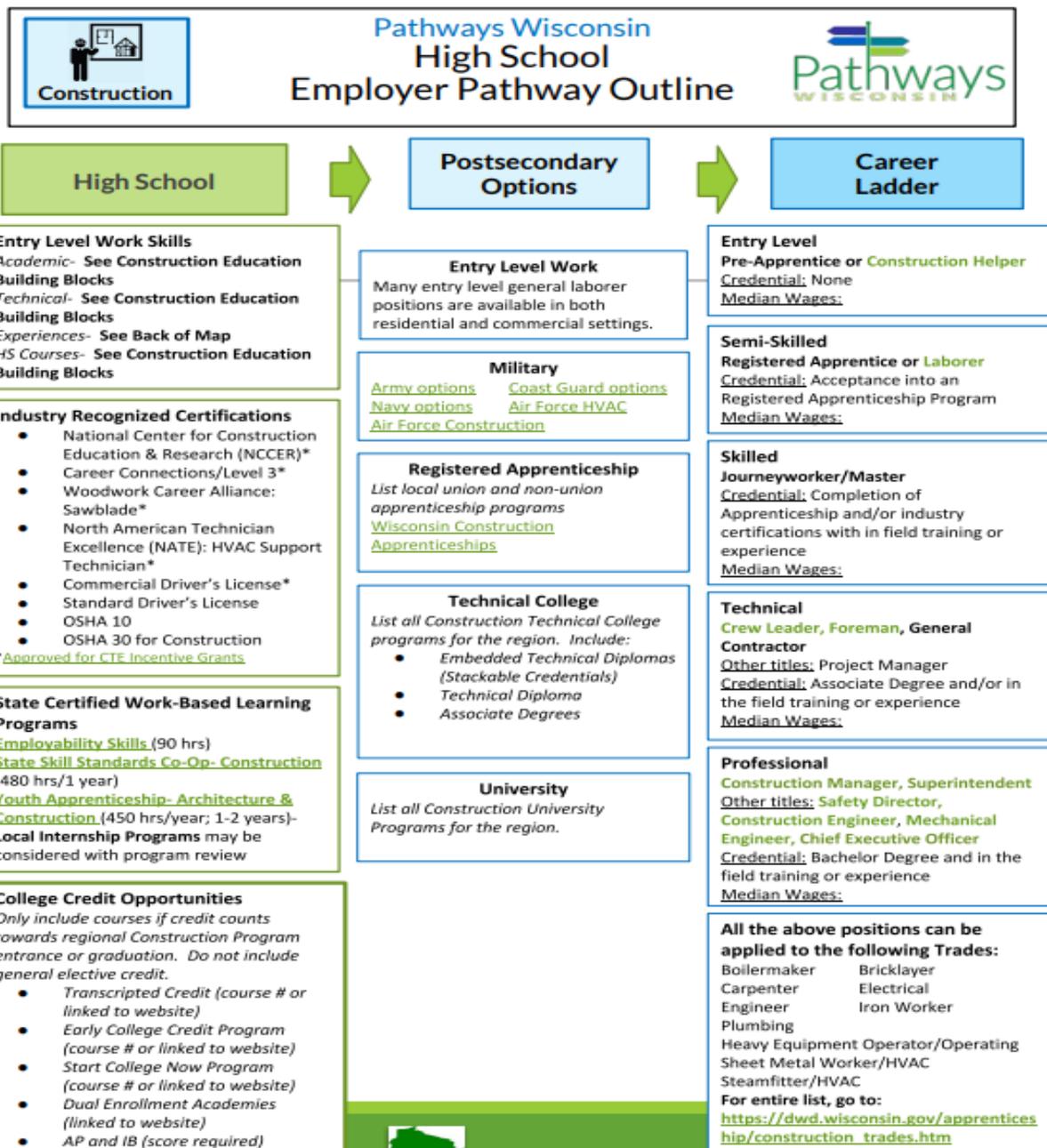
##### Architecture and Construction (AC)

- AC1.a. Analyze construction requirements, materials, structures, techniques, and maintenance.
- AC1.b. Apply measurement systems in the planning and layout process used in the construction industry.
- AC1.c. Demonstrate the safe and appropriate use of hand tools common to the construction industry.
- AC1.d. Demonstrate the safe and appropriate use of portable power tool common to the construction industry and appropriate to the student's grade level.
- AC1.e. Demonstrate project management procedures and processes as they occur in a construction project.
- AC1.f. Demonstrate the value and necessity of practicing occupational safety in the construction industry facility and job site.
- AC1.g. Demonstrate the variety of building phases, systems, and techniques used in architecture and construction.
- AC1.h. Demonstrate the impact of financial, technical, environmental, political, societal and labor trends on the past and future of the construction industry.

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## THE STATE ENDORSED PATHWAY OUTLINE

SEE [Pathways Wisconsin webpages](#) for State-Endorsed Regional Maps



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## THE STATE ENDORSED PATHWAY OUTLINE



### Pathways Wisconsin High School Employer Pathway Outline



#### Specific Industry Related Career Awareness and Exploration Experiences

**Consider:**

**WISCONSIN**

SkillsUSA Wisconsin- <http://www.skillsusa-wi.org/wordpress/>

Inspire Profiles & Career Development Activities <https://www.inspirewisconsin.org/>

ABC of Wisconsin: <https://buildyourcareerwi.org/>

AGC of Wisconsin: <http://www.agcwi.org/workforce-development.htm>

Build Wisconsin: <https://www.buildwi.org/>

Building Advantage WI: <http://www.buildingadvantage.org/tradesrecruitment/>

WI Sheet Metal & Steamfitters: <https://www.choosebigger.com/wisconsin/>

**NATIONAL**

NCCER- <https://www.nccer.org/>

Build Your Future- Careers in Construction- <http://www.byf.org/>

**LOCAL**

Specific Workforce Development programs

Technical College Boot Camps or Summer Programs

Project Based Learning programs

Summer Exploration Camps

#### Other Industry Associations to Engage

- [Associated Builders & Contractors- Wisconsin \(ABC\)](#)
- [Associated General Contractors- Wisconsin \(AGC\)](#)
- [Focus on Energy](#)
- [North Central States Regional Council of Carpenters](#)
- [Plumbing Mechanical Sheet Metal Contractors' Alliance](#)
- [Wisconsin Builders Association \(WBA\)](#)
- [Wisconsin Center for Energy Workforce Development](#)
- [Wisconsin Regional Training Partnership \(WRTP\)](#)
- [Wisconsin Transportation Builders Association \(WTBA\)](#)

# Education Building Blocks

## APPENDIX A– EMPLOYABILITY SKILLS

### Wisconsin Employability Skill Standards

1. Develops positive relationships with others.
2. Communicates effectively with others.
3. Collaborates with others.
4. Maintains composure under pressure.
5. Demonstrates integrity.
6. Performs quality work.
7. Provides quality goods or service (internal and external).
8. Shows initiative and self-direction.
9. Adapts to change.
10. Demonstrates safety and security regulations and practices.
11. Applies job-related technology, information, and media.
12. Sets personal goals for improvement.



### Innovation Learning Outcomes

#### Art of Entrepreneurship– Critical Thinking

1. Information discovery
2. Interpretation and analysis
3. Reasoning
4. Problem Solving/Solution Finding
5. Constructing arguments

#### Art of Entrepreneurship– Communication

1. Engaging in conversations & discussions
2. Using 21st century communication tools
3. Listening
4. Delivering oral presentations

#### Art of Entrepreneurship– Collaboration

1. Leadership & initiative
2. Cooperation
3. Openness
4. Responsibility & productivity
5. Use if Tech Tools for collaboration
6. Responsiveness

#### Art of Entrepreneurship– Creativity

1. Idea generation
2. Idea design & refinement
3. Openness & courage to explore
4. Work creatively with others
5. Creative production & innovation

#### Attitude of Entrepreneurship

1. Adaptability & openness to change
2. Curiosity & imagination
3. Risk taking & being opportunistic
4. Optimism & persistence; Resilience
5. Focus; Goal-Oriented

#### Science of Entrepreneurship

1. Who is your customer?
2. What can you do for your customer?
3. How can you acquire your customer?

[Student Entrepreneurial Accelerator Program](#). The Commons, 2016.

# Education Building Blocks

## APPENDIX B– DIGITAL LITERACY SKILLS

### Wisconsin Standards for Information and Technology Literacy

#### Empowered Learner

1. Students leverage digital tools and strategies to take an active role in choosing and achieving their learning goals.
2. Students understand the fundamental concepts of technology operations and demonstrate the ability to choose, use, and troubleshoot current technologies.
3. Students are able to transfer knowledge to explore emerging technologies.

#### Digital Citizen

1. Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world.
2. Students will demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

#### Knowledge Constructor

1. Students critically curate a variety of digital tools and diverse resources.
2. - Students produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

#### Innovative Designer

1. Students use a variety of digital tools and resources to identify and solve authentic problems using design thinking.
2. Students use a variety of technologies within a design process to create new, useful, and imaginative solutions.

#### Computational Thinker

1. Students develop and employ strategies for understanding and solving problems.

#### Creative Communicator

1. Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.
2. Students publish and present content customized for their audience(s), purpose, and task.

#### Global Collaborator



1. Students use digital tools to broaden their perspectives and enrich their learning with culturally responsive practices by collaborating and working effectively with local and global teams.
2. Students use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.

[Complete Standards set](#) by grade band. November 2017.

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## APPENDIX C – STATE CONSTRUCTION PARTNERS

The Wisconsin Department of Public Instruction (DPI) and J.P. Morgan Chase New Skills for Grant project, Pathways Wisconsin, thank the following partners for contributing to the development of this secondary Career Pathway.

### Employer Partners.

- John Anderson, Wisconsin Regional Training Partnership
- Scott Bloedorn, Project Manager, Focus on Energy
- Dajen Bohacek, Associate Director, Plumbing Mechanical and Sheet Metal Contractors' Alliance
- Dave Branson, Building Trades Council South Central Wisconsin
- Bill Clingan, Wisconsin Regional Training Partnership
- Peter Coffaro, Chief Program Officer, Employ Milwaukee
- Mike Fabishak, CEO, Associated General Contractors of Greater Milwaukee
- Sara Fredrickson, Human Resources, Precision Drive
- Jose Galvin, Manager, Apprenticeship & Business Engagement, Employ Milwaukee
- Michelle Grajkowski, Wisconsin Manufacturers and Commerce
- Tracey Griffith, HR Compliance Manager, Construction Resources Management Inc/Walbec Group
- Laura Heller, Wisconsin Regional Training Partnership
- Nate Jurowski, Associated General Contractors of Greater Milwaukee
- Brian Mckee, Midwest Homes
- Tim O'Brien, President, Tim O'Brien Homes
- Joan Olson, Operations Manager, Wisconsin Builders Association
- Steve Pipson, Focus on Energy
- Mike Price, Instructor, Outreach Specialist, North Central States Regional Council of Carpenters
- Mark Reihl, Political Director, Wisconsin, North Central States Regional Council of Carpenters
- Jeff Roach, Associated General Contractors of Wisconsin
- Elizabeth Roddy, Director Recruitment & Training, Associated Builders & Contractors of Wisconsin
- Greg Schaffer, Ashley Furniture/Wisconsin Builders Association
- Sean Stephenson, Wisconsin Transportation Builders Association
- Kelly Tourdot, Associated Builders & Contractors of Wisconsin
- Matt Waltz, Vice-President, Wisconsin Regional Training Partnership



### Educational Partners.

- Mark Albers, UW-Platteville
- Gretchen Bockenbauer, UW-Platteville
- Steve Horvath, Moraine Park Technical College
- Brent Kindred, Technology & Engineering Education Consultant, Wisconsin Department of Public Instruction
- Gindy Neidermyer, UW Stout

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### **Public Agency Partners.**

- Rebecca Deschane, Talent Director, Wisconsin Economic Development Corporation
- Andrea Gabel, Director of Sector Strategy Development, Wisconsin Economic Development Corporation
- Amy Phillips, Youth Apprenticeship, Wisconsin Department of Workforce Development
- Vincent Rice, Wisconsin Economic Development Corporation