



Minnesota Made: Connecting STEM and CTE for Real-World Learning

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FOCUS

The trade and industry area of Career and Technical Education (CTE) is composed of four specific program areas:

- Communications Technology
- Construction
- Manufacturing
- Transportation
- Technology

What are some words you would use to describe CTE?

What are some words you would use to define CTE?



Shop
Class

What are some words you would use to define CTE?

A green speech bubble with a tail pointing towards the bottom-left.

Shop
Class

A dark blue speech bubble with a tail pointing towards the bottom-left.

Industrial
Arts

What is CTE?

What are some words you would use to define CTE?



Shop
Class



Industrial
Arts



VoTech

What is CTE?

What are some words you would use to define CTE?



Shop
Class



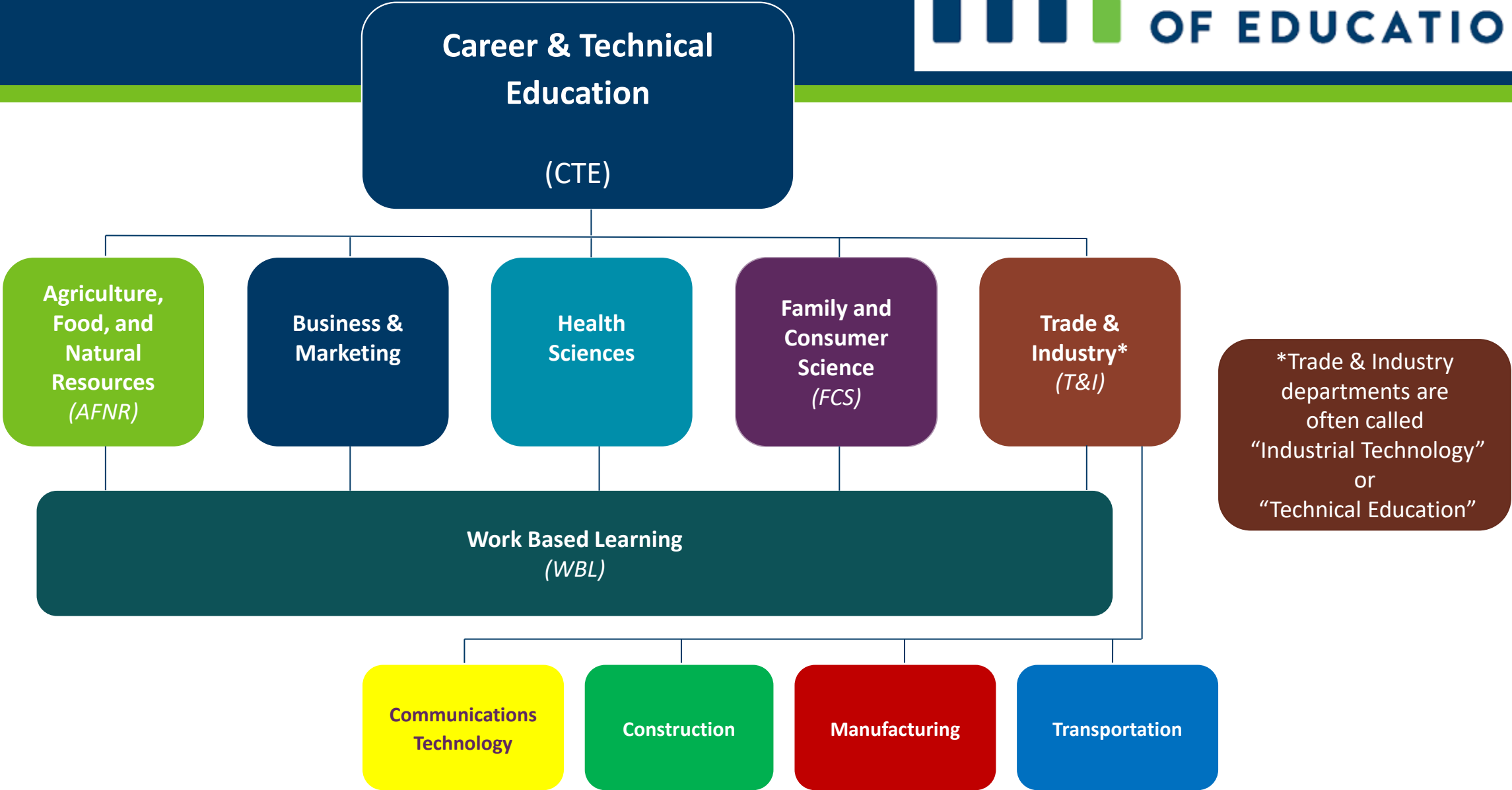
Industrial
Arts



VoTech



Missing
Fingers!



CTE vs Vocational Ed

Traditional Vocational Education

- For specific students
- Limited program areas offered
- Separate “track” focused on technical education
- High school focused
- Trained with focus on specific occupational skill set



CTE vs Vocational Ed



Career & Technical Education

- For all students
- 16 career clusters & 79 pathways offered
- Integrated with academics
- Pathways to employment and/or college degrees
- Progression of occupational & employability skills

What CTE and STEM share?

Broad, not narrow

Bring skills and knowledge together

- Problem-solving (problem identifying)
- Hands-on
- Future-ready skills

Start earlier

For ALL students

Why CTE? - Student Engagement



Why CTE? - Context

hmmmm...
and yet another
day has passed
and I did not
use Algebra
once...very
interesting.



Why CTE? - Access



Why CTE + STEM?



Applied learning
= deeper
engagement



Real-world skills =
student confidence



Cross-disciplinary
thinking =
workforce ready

Are students prepared for the next step?*

- Just **35%** of students going to 4-year college
 - down 20% from 5 years ago
- **72%** don't feel prepared for life after high school
- **77%** more engaged if better understood their strengths and career options
- **50%** lack work-based learning experiences

**YouScience Report: Life Beyond High School*

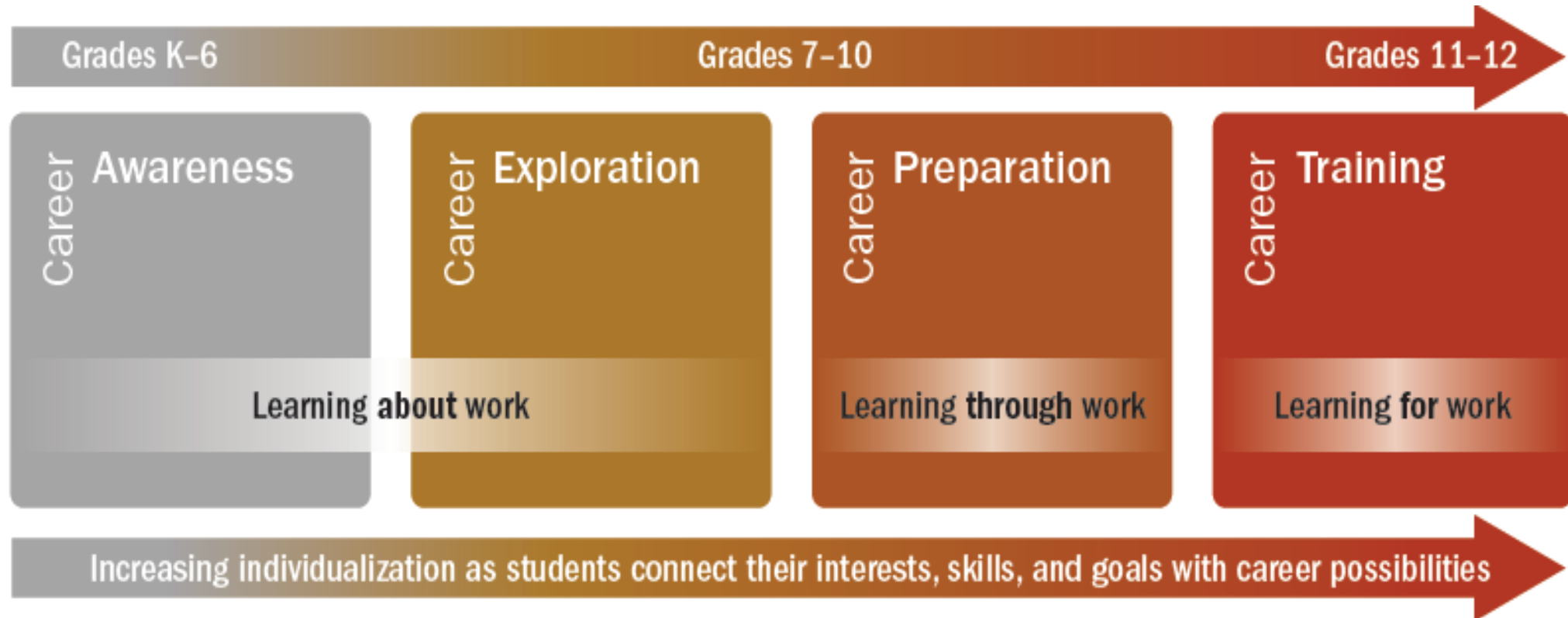
Future Workforce Needs: 1-2-7

The true ratio of jobs in our economy is 1:2:7

- For every **ONE** occupation that requires a master's degree or more...
- **TWO** professional jobs require a university degree...
- And **SEVEN** jobs require a technical certificate or two-year degree

*This ratio is the same today as it was in 1950...
and is projected to continue into 2030*

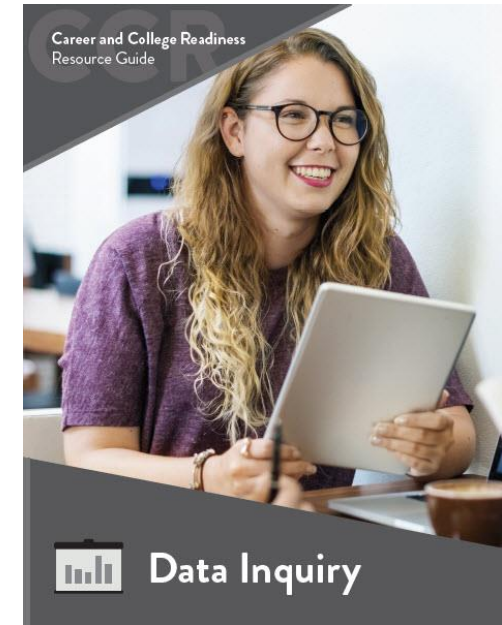
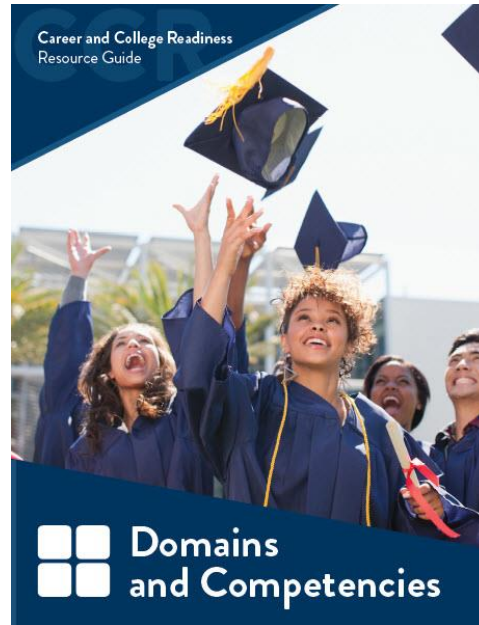
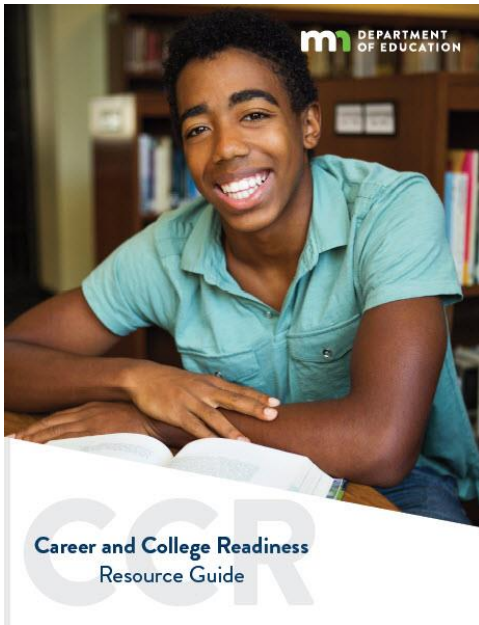
Career Connected Learning



Source: ccrscenter.org

CCR Resource Guide

Developed by broad spectrum of education, community, and business stakeholders



<https://education.mn.gov/MDE/dse/ccs/>

What can I do?



You Are Already Doing It!

You
are
here!

Looking for new ways to engage

Looking to make your lessons more
relevant



Building those skills students will need

Every Teacher is a Career Connector

You don't need
to teach CTE to
connect
students to
careers

- Invite guest speakers
- Tie lessons to local careers
- Real-world projects
- Connect with alumni

What It Looks Like in School



What It Looks Like Across Grades



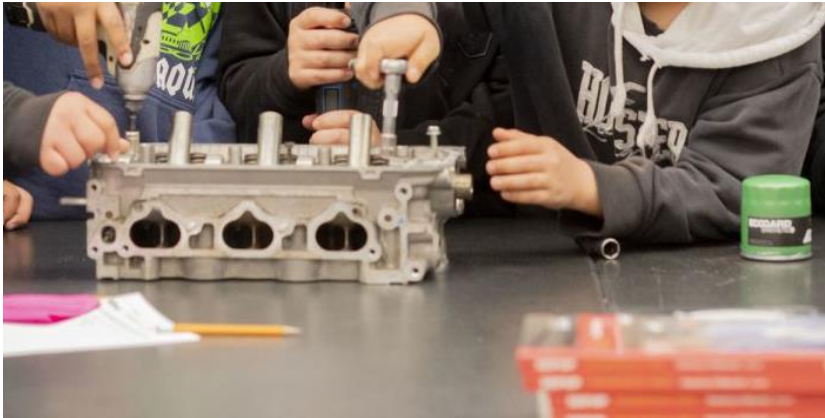
Elementary: STEM units tied to local careers



What It Looks Like Across Grades



Middle School: Hands-on experiences



CAREER

DAY

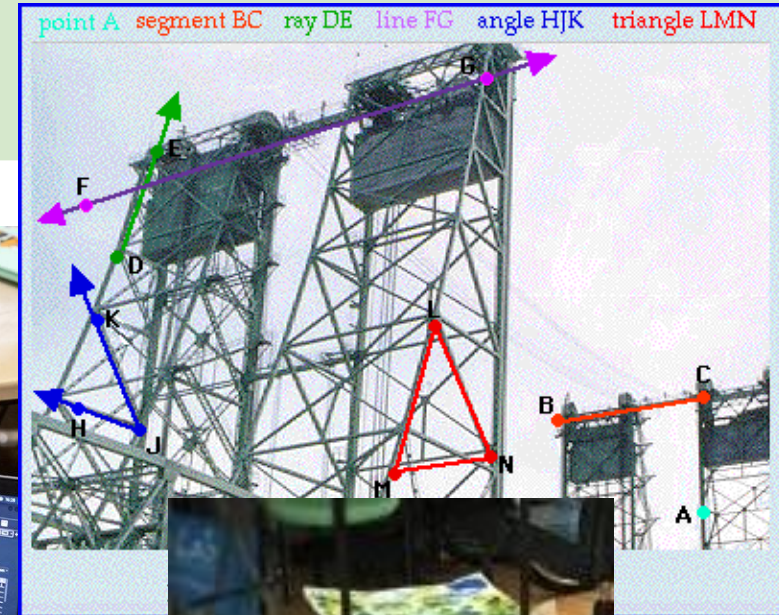
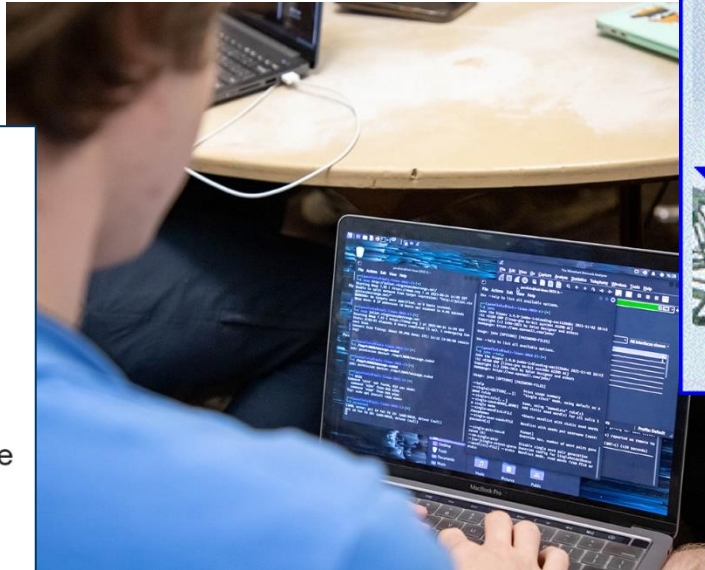
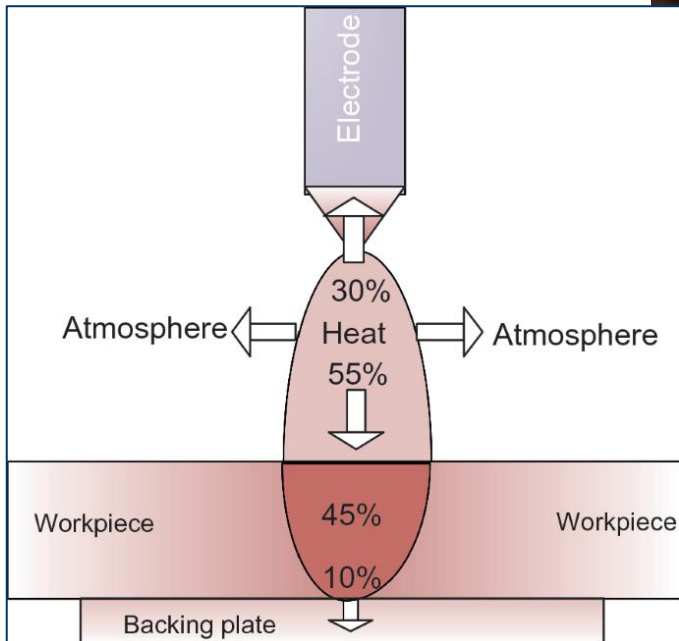
Guest Speakers



What It Looks Like Across Grades



High School: Connect the Skills





Using Online Tools

- Self Discovery
- Personal Learning Plan
- Career Clusters



Minnesota Career and Technical Education



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Programs and Support

Career and Technical Education (CTE) programs are a sequence of courses that integrates core academic knowledge with technical and occupational knowledge and skills to provide students a pathway to postsecondary education and careers. CTE provides opportunities to explore high-demand career options and gives students the technology and skills needed for success in adult life.

High-Quality CTE programs include:

- An unduplicated sequence of strong academic and career and technical courses that incorporate applied, contextual, cross-curricular and interdisciplinary instructional strategies.
- Exploration of careers within a career cluster and/or pathway through the identification of potential career opportunities and the postsecondary training and educational requirements of those choices.
- Opportunities to participate in structured learning experiences and career and technical student organizations (CTSO).
- Alignment and incorporation of secondary and postsecondary education elements such as curricula, standards and assessments.
- Preparation needed for students to enter employment in a specific occupation that aligns with business and industry standards and may lead to an industry-recognized credential or certificate at the secondary level.
- Preparation for postsecondary education. Career and technical education programs provide a purpose and rationale for academic preparation and aid students in meeting the entrance requirements for college programs.
- Opportunities to earn college credit for college courses successfully completed during high school (e.g., dual/concurrent credit or articulated credit).

Program for New CTE Teachers

The New CTE teacher program is designed to help teachers with less than four years of experience gain the knowledge and resources they need to be successful in the CTE classroom. It is ideal for new CTE teachers or teachers who are teaching CTE courses for the first time.





- Career outreach groups
- Chamber of Commerce
- Trade Associations
- Post-secondary partners

Professional Development:

[Trade and Industry Professional Development Calendar](#) - 9/11/24

Calendar of professional development opportunities for teachers of Trade and Industry programs.

Career Exploration

[Minnesota Department of Labor and Industry: Career Counseling Resource](#) - 9/27/24

Department of Labor and Industry-developed resource for educators and school counselors to share with students about careers in construction and the skilled trades.

[Minnesota Department of Labor and Industry: Trade Tools Job Data](#) - 9/27/24

Department of Labor and Industry-developed resource featuring wage and education information about the most in-demand construction careers in Minnesota.

[Minnesota Commercial Driver License \(CDL\) Information](#) - 8/5/24

Information on the available resources and requirements for obtaining a Minnesota Commercial Driver License (CDL).

[Trade and Industry Engagement - Advisory Committees](#) - 5/1/23

Resources to assist with the development and implementation of Career and Technical Education (CTE) advisory committees for Trade and Industry programs.

[Minnesota Department of Labor and Industry: Career Information on Construction](#) - 4/14/21

Department of Labor and Industry-developed resource with tips and ideas on how to share information on careers in construction and the skilled trades with students.

[Career Development in Career and Technical Education Programs](#) - 1/28/21

Progression of K-12 career development activities with increased individualization and career skill development.

[Descriptions of Industry Engagement](#) - 1/20/21

Provides information and descriptions of various levels of engagement activities for companies to develop and expand relationships with schools and organizations.

Related offsite resources:

[Department of Employment and Economic Development \(DEED\) Data Center](#)

[Department of Labor & Industry-- Construction and Skilled Trades Career Counseling Resources](#)

[International Technology and Engineering Education Association \(ITEEA\)](#)

[Midwest Teachers of Transportation and Industrial Areas \(MTTIA\)](#)

[Minnesota Department of Employment and Economic Development \(DEED\)--Job Skills Transfer Assessment Tool \(JOBSTAT\)](#)

[Minnesota Technology and Engineering Educators Association \(MTEEA\)](#)

[Project Lead the Way](#)

[SkillsUSA Minnesota](#)

[St. Cloud State University Department of Technology Education](#)

Career Connected Learning



Scan QR Code
for webpage link




CTE Resources



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Middle School Frameworks



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New CTE Teachers

Contact

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MDE > Districts, Schools and Educators > Career and Technical Education > Middle School CTE Resources

Middle School CTE Resources

A variety of resources from national organizations offer a number of best practices in providing career development for students in middle grades, including [Advance CTE](#), the [Association for Career and Technical Education \(ACTE\)](#), the [National Career Development Association](#), and the [American School Counselor Association](#). Across these resources, a number of common best practices for providing career development to students in middle grades are shared. These best practices include:


- Equitable access to at least one year-long course related to career development, including flexible scheduling for students and access to programming regardless of a student's achievement level.
- Courses and activities anchored in careers, including an opportunity to explore a wide breadth of careers across all [16 Career Clusters](#), and classroom activities that help students make connections between potential careers and the skills and preparation necessary for those careers.
- Standards-based courses and activities which integrate academic, technical and employability skills across multiple career clusters.
- Experiential learning which engages students in a mix of school-based and work-based experiences and hands-on, real-world activities.
- Integration of career development across the full K-12 system where all students and families engage in regular academic and career planning.
- Employer engagement, including multiple short-term interactions with business and community members.
- A focus on student growth, including multiple ways for students to demonstrate what they have learning through the participation in Career and Technical Student Organizations, projects, and assessments.

Developed from [Best Practices in Middle School Career and Technical Education Expansion](#)

Minnesota Middle School Frameworks

[Field-Specific CTE Courses \(Business, Trade and Industry\)](#) - 6/10/24
This document contains suggested indicators and benchmarks for core middle school Business, and Trade and Industry, CTE courses.

[Common CTE Modules \(Business, Trade and Industry\)](#) - 6/10/24
This document contains instructional modules that could be incorporated into any middle school CTE Business or Trade and Industry course.



Middle school career exploration and development is important for high school and post-high school success.

Related MDE resources:

[Minnesota Personal Learning Plans \(PLP\) Information](#)

Related offsite resources:

[Broadening the Path: Design Principles for Middle Grades CTE](#)

[Career Exploration and Assessment](#)

- Two types of modules:
 - General
 - Program-specific
 - Foundations of Industrial Technology
 - **STEM in CTE**
- Used by all middle school CTE teachers

<https://education.mn.gov/MDE/dse/cte/ms/>

Full STEAM Ahead: Exploring MDE's K–5 STEAM Framework



Sarah Carter - MDE



9:30-10:30

What's one way you can connect your content to careers this year?

- Start with something small, then grow
- Find partners who can help you
- Check into resources

Contact with questions

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