



CAREER AND TECHNICAL EDUCATION

OCTOBER 13, 2020

AGENDA

- Introductions
- Career Clusters/Pathways
- The Need for CTE
- Benefits of CTE
- CTE's Role in Key Areas of American Education
- Overview and Closing



Defining CTE

Career and Technical Education (CTE)

Career and technical education is the practice of teaching specific career skills to students in middle school, high school, and post-secondary institutions.

- *Applied Educational Systems*

Career and Technical Education provides secondary and post-secondary students with the academic and technical skills and knowledge to prepare for the current and future workforce.

- *National Alliance for Partnerships in Equity*

16 Career Clusters



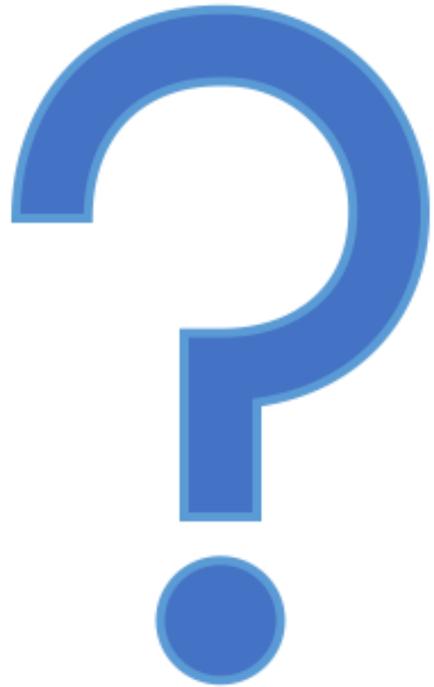
Career Pathways

 <p>Arts, Audio/Video Technology and Communications</p>	<ul style="list-style-type: none"> • A/V Technology & Film • Journalism & Broadcasting • Performing Arts • Printing Technology • Telecommunications • Visual Arts 	 <p>Information Technology</p>	<ul style="list-style-type: none"> • Information Support & Services • Network Systems • Programming & Software Development • Web & Digital Communications
 <p>Business, Management and Administration</p>	<ul style="list-style-type: none"> • Administrative Support • Business Information Management • General Management • Human Resources Management • Operations Management 	 <p>Law, Public Safety, Corrections and Security</p>	<ul style="list-style-type: none"> • Correction Services • Emergency & Fire Management Services • Law Enforcement Services • Legal Services • Security & Protective Services
 <p>Education and Training</p>	<ul style="list-style-type: none"> • Administration & Administrative Support • Professional Support Services • Teaching/Training 	 <p>Manufacturing</p>	<ul style="list-style-type: none"> • Health, Safety & Environmental Assurance • Logistics & Inventory Control • Maintenance, Installation & Repair • Manufacturing Production Process Development • Production • Quality Assurance



CAREER AND TECHNICAL EDUCATION *THE NEED FOR CTE*

OCTOBER 13, 2020



What does our
Data Tell us?

Disconnect between Education to the Realities of Employment



Education

The official four-year graduation rate for students attending public colleges and universities is 33.3%. The six-year rate is 57.6%.



Employment

43% of college graduates are underemployed in their first job. Of those, roughly two-thirds remain in jobs that don't require college degrees five years later.

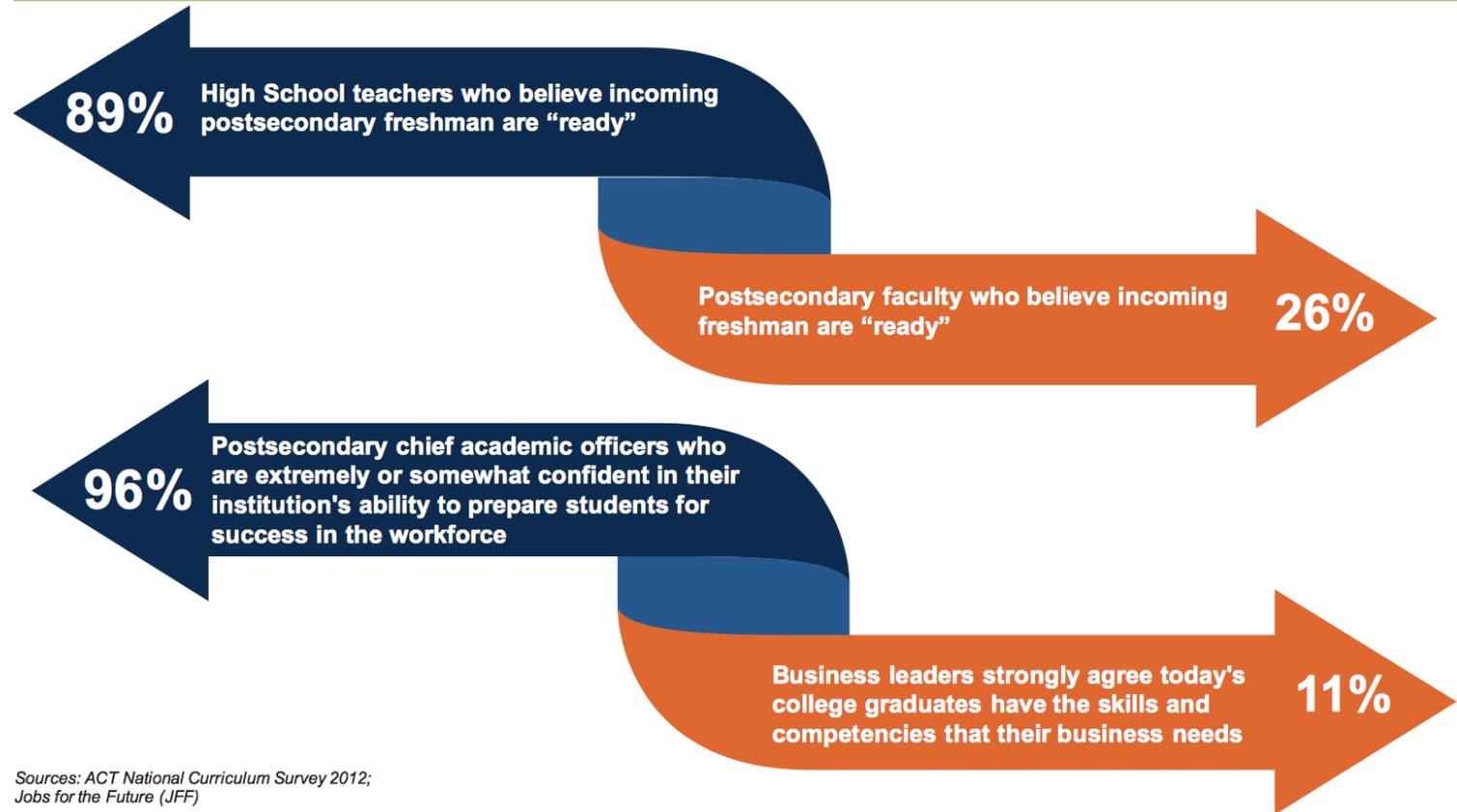


Economic Development

Employers are hiring, but 80% say they can't find skilled candidates

Mismatch in education and business...

MISMATCHES IN "READINESS"



Sources: ACT National Curriculum Survey 2012;
Jobs for the Future (JFF)



Not connecting students
to their
interest and **career paths**
matter



Long Term Impact of not Getting it Right

Economix
Explaining the Science of Everyday Life

Only Half of First-Time College Students Graduate in 6 Years

By CATHERINE RAMPPELL FEBRUARY 26, 2013 6:40 PM 89 Comments

As we've covered here *many times before*, there is an abundance of evidence showing that going to college

CATHERINE RAMPPELL
Dollars to doughnuts.

BloombergBusinessweek
Global Economics

<http://www.businessweek.com/articles/2014-01-16/student-loans-the-next-big-threat-to-the-u-dot-s-dot-economy>
Student Loans, the Next Big Threat to the U.S. Economy?
By Caroline Galas Gage and Janet Lorin | January 16, 2014

Tiffany Roberson works for the state of Texas as a parole officer, teaches part-time, and is living with her parents. She completed her master's degree. She's held off marrying her boyfriend of four years.

\$1 trillion student loan debt widens US wealth gap

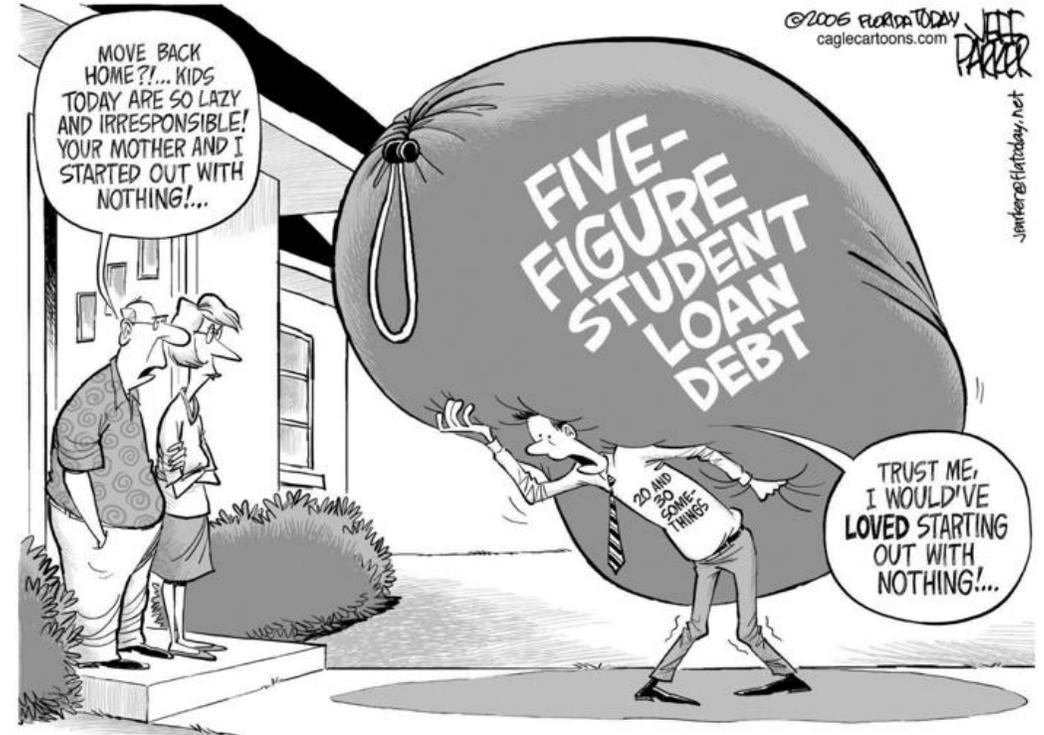
Posted Thursday, Mar. 27, 2014 0 comments Print Reprints Share Like 0

ARTICLE PHOTOS (3) COMMENTS

BY CAROLYN THOMPSON
Associated Press

Every month that Gregory Zbylut pays \$1,300 toward his law school loans is another month of not qualifying for a decent mortgage.

Even parents who pay toward their student loans, like \$900 Dr. Nida Dargatzis





In today's world, twenty-first-century skill demands are steadily increasing. **Most high-paying jobs require additional education and training beyond a high school diploma.** We must make sure that our children, particularly those who are traditionally underserved, are prepared for and have access to postsecondary education.

—Gov. Bob Wise, Alliance for Excellent Education



Less than **10 percent** of children born in the bottom quartile of household incomes attain a bachelor's degree by age 25, compared to **more than 50 percent** in the top quartile.

Students Not Feeling Engaged

HIGH SCHOOL DISENGAGEMENT

The 2012 Gallup Student Poll asked students how involved and enthusiastic they feel about school. Nearly eight in 10 elementary students reported high engagement. **By high school, only half that many did.**

ELEMENTARY SCHOOL

76%

MIDDLE SCHOOL

61%

HIGH SCHOOL

44%



How can **relevance be increased** while supporting the pathway to postsecondary success for all students, particularly those traditionally underserved?

Understanding Research

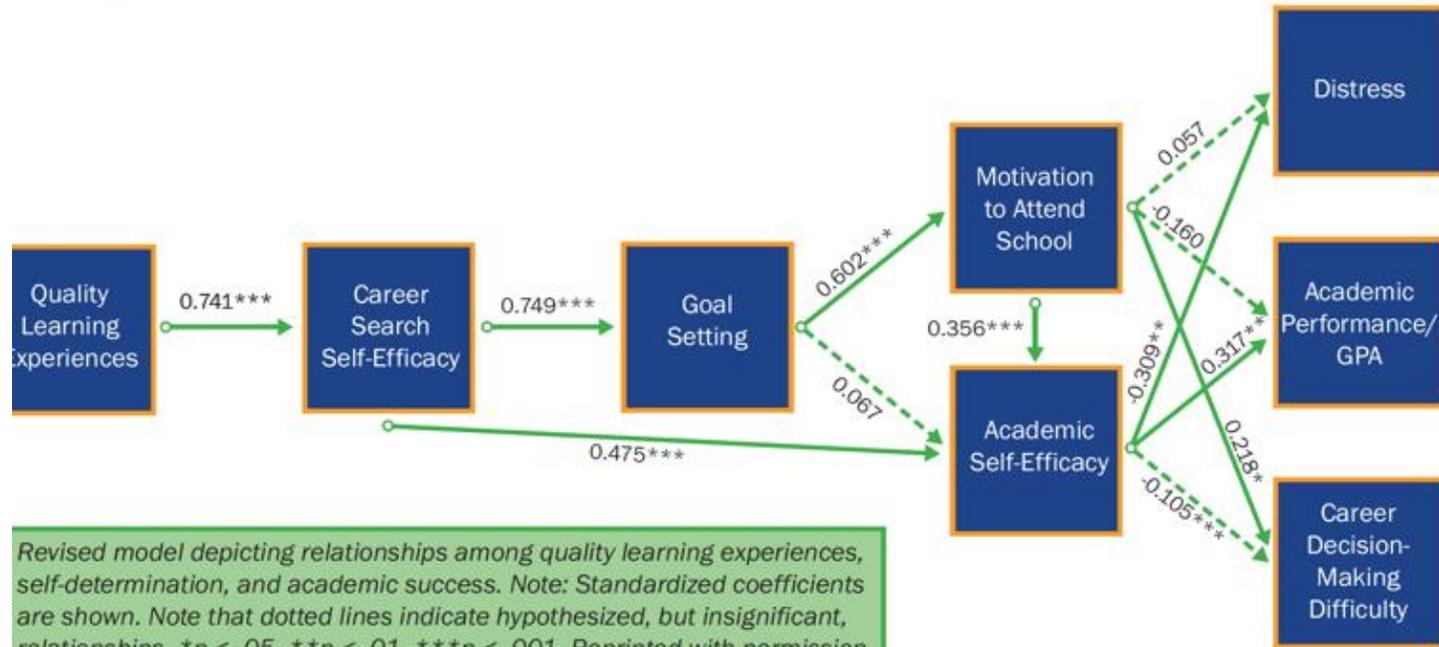
Understanding Research - Motivators

Table 4

Strategy effect sizes from meta-regression model.

Strategy	Effect size	<i>p</i>
Career Development/Job Training 	0.81	0.56
Family Engagement	0.67	0.00
Mentoring 	0.63	0.91
Behavioral Intervention	0.46	0.01
Literacy Development 	0.42	0.00
Work-Based Learning 	0.26	0.01
School/Classroom Environment	0.25	0.00
Service-Learning 	0.21	0.00
Health and Wellness	0.18	0.00
Academic Support 	0.11	0.00

Figure 2: **Hypothesized Relationships Among Quality Learning Experiences, Self-Determination, and Academic Success**



Revised model depicting relationships among quality learning experiences, self-determination, and academic success. Note: Standardized coefficients are shown. Note that dotted lines indicate hypothesized, but insignificant, relationships. * $p < .05$. ** $p < .01$. *** $p < .001$. Reprinted with permission from the Career Development for Exceptional Individuals.

Understanding
Research -
Motivators



CTE Works

Benefits of CTE

Source: Association of Career and Technical Education

For Business:

- Significantly more likely to develop soft skills
- 50% STEM jobs require less than a 4-year degree
- Aligned to middle-, technical-, and high-skilled jobs, hard-to-fill jobs, and jobs in demand

For the Economy:

Annual economic benefits (\$3.5 billion in OK)

Increased contributions to state economy
(\$5.1 billion in CO)

Returns \$26 in lifetime earnings and benefits for every
\$1 invested in HS CTE (WA)

Benefits of CTE

Source: Association of Career and Technical Education/NM PED

- For High School Students:
 - Graduate **at 94% vs. 71% for** non-CTE students
 - **91% with 2-3 CTE credits enroll in college**
 - 58% of NM CTE concentrators go to college, advanced training, military service, or employment within six mo. after graduation
 - 81% of HS dropouts say relevant, real-world opportunities would have kept them in school

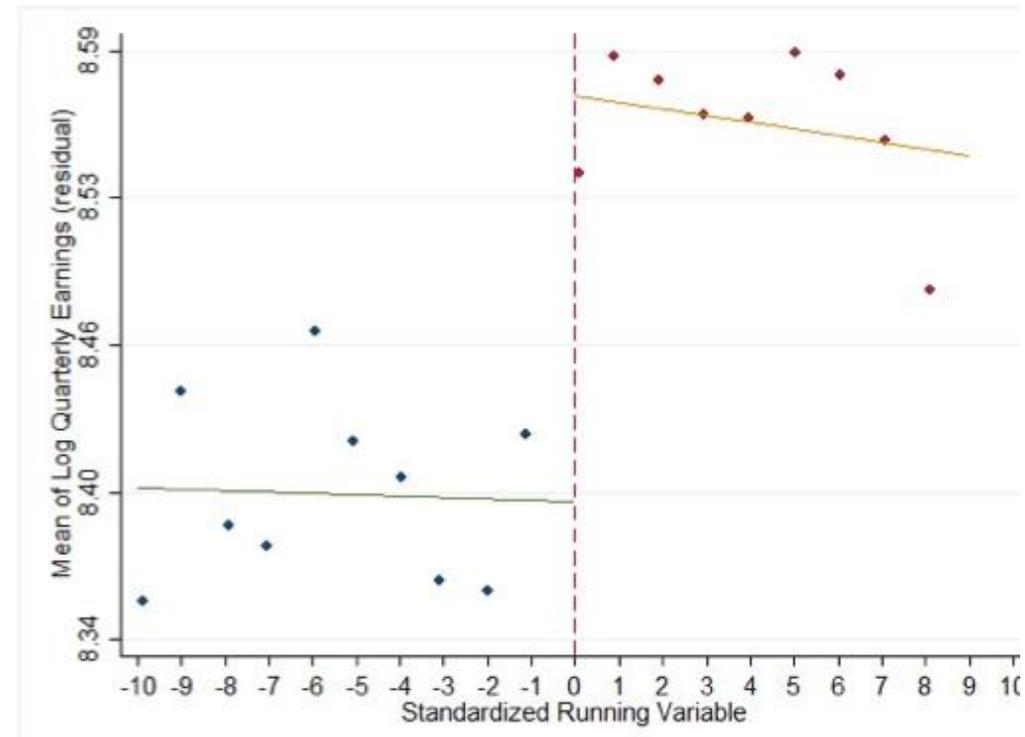
Benefits of CTE

Source: Association of Career and Technical Education

- For College Students and Adults:
 - Technical or Associate of Applied Science degrees out-earn bachelor degree holders by \$2,000-\$11,000. (Research from TX, CO, VA)
 - 27% of those with licenses or certificates earn more than average bachelor's degree holder
 - 48% of CTE concentrators earn credentials or diplomas
 - 68% employed, in military service, or apprenticeships in 6 mo. of graduation
 - 64% of all degrees awarded statewide

Study: Career and Technical Education Yields Not Just Higher Earnings but Higher Test Scores

- Enrolling in Connecticut's technical high school system increases ... students' earnings by roughly one-third in the years immediately following high school, [a study](#) has found.
- Not only do the schools boost young men's professional prospects, the authors conclude, they have a substantial impact on their **academic performance as well, suggesting that their early success could persist well into their careers.**
- "That improvement means you can take a kid who has a certain set of interests and get them into a school that's going to fulfill those interests," he said. "And the increased academic engagement that's created because of those interests means that they're not just going to do better at becoming a plumber or becoming an HVAC specialist, but they're also going to accumulate the general skills that people need to succeed in the labor market in the long run



CTE Matters to Your Region

(Source: Fordham Institute Report)

How Aligned is CTE to Local Labor Markets?

- Fields that support a significant number of jobs see little CTE course-taking in high school
- Students take more related CTE courses when aligned to more local jobs
 - 80% of Americans lives less than a couple hours drive from home
 - Median distance is 18 miles; 44 miles for New Mexico
- Call to action:
 - Local business, industry, secondary and post-secondary work in a united way
 - Better integration of what is taught in HS CTE programs with skills, knowledge, and positions needed in local labor markets through sector strategies that include WBL

Summarizing the Story...

- **It's a fact that 95% of all CTE students graduate high school.**
 - Compared with 80% National Average
- **CTE Has Incredible Career Demand**
 - Between 2012 and 2022, the United States will have **50,557,900 job openings** that can be filled by CTE graduates.
- **CTE Students Achieve Better Grades.**
 - **70% of CTE students say that their program helped them earn better grades.**

CTE Has Surprisingly Satisfied Students

One of the biggest benefits to CTE is that it can help students appreciate and even enjoy their education.

- In fact, 80% of all CTE students say they're satisfied with their education and the career prospects that come with it. **Only 45% of these students felt "positively"** about college and career readiness.



CTE Offers Students Strong Direction in Life

In a staggering contrast to most high school graduates and even college students, **82% of CTE students say that CTE helped them "know where they were headed."**.....Regardless of the reason, we've already noted that 55% of all high school graduates don't feel prepared for careers or post-secondary education.

Summarizing the Story...Continued



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CTE's Role in American

Competitiveness

Career and Technical Education plays a major role in strengthening the U.S. workforce by providing:



College Readiness

- Engages students in school, thus a lower drop-out rate
- Motivates students by integrating academics with technical skills
- Provides relevance by connecting academics with careers



Meaningful Degrees/ Credentials

CTE provides pathways to the attainment of meaningful, stackable credentials, including industry-recognized certifications as well as associate and bachelor's degrees and postsecondary certificates.



Career Readiness

Three critical skillsets form the foundation for career readiness:

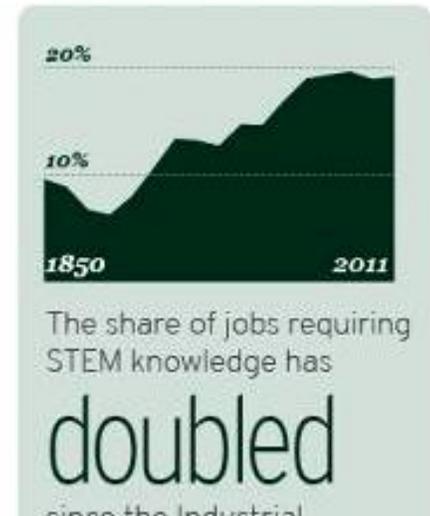
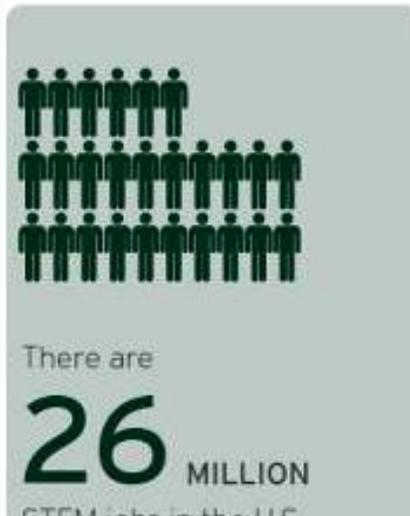
- Academic skills
- Technical Skills
- Employability Skills – often developed in collaboration with employers who are vital to the local or regional economy.



Previous STEM studies have neglected the many blue collar and technical jobs that require considerable STEM knowledge. But this study finds that

50%

of STEM jobs **do not require** a bachelor's degree. As a result, STEM knowledge plays a much larger role in our economy than previously thought:





CTE's Role in Dropout Prevention

High-quality CTE can help more students persist in and complete high school.



CTE as a solution

- Rate of drop-out decreases as students add CTE courses.
- CTE students 8-10 less likely to drop out in 11th/12th grade.
- “A quality CTE program and a related guidance program are essential for all students.” (The National Dropout Prevention Center/Network)



Increased Student Engagement

CTE offers students relevant learning experiences that answer the age-old question “Why do I have to learn this?” while at the same time enhancing students’ academic achievement and meeting industry needs.



Positive Relationships

- Often some type of formal mentoring, job-shadowing, work-based learning and/or internship opportunities that link students to community and others.
- CTSO’s provide opportunities to connect and engage with peers and advisors who share common interests.

CTE's Role in Rural Education



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CTE imparts technical and employability skills through engaging, relevant hands-on learning, integrated with academics, for all students, including those living in rural settings where education and economic development systems face unique challenges.

Geographical Dispersant

01

Exemplary CTE programs in rural areas provide rigorous and relevant career pathways that engage students in planning for their futures; develop their academic, technical and employability skills; and provide opportunities for work-based learning and mentorship, all delivered flexibly through different school formats as well as online learning. Indeed, rural school districts already see the value of CTE for students

Engagement

02

Disengagement can be a particular problem for rural youth, who may have trouble envisioning their future, particularly when they lack access to role models who have earned a valuable credential. However, research has demonstrated that CTE engages students and can help them stay in school by providing relevant, real-world learning opportunities.

Community impact

03

CTE can also provide students with foundational skills in areas key to the local economy in rural districts. Rural schools encourage technical skill development, expose students to careers, provide mentorship and ensure students can attain valuable credentials which can lead to employment within the local community.

Flexibility to Support Area Workforce Development

04

By delivering skills for further education and the workplace through flexible and creative models, CTE holds the key to ensuring rural students can achieve their full potential by developing a prepared workforce that can respond to local and regional economic needs.

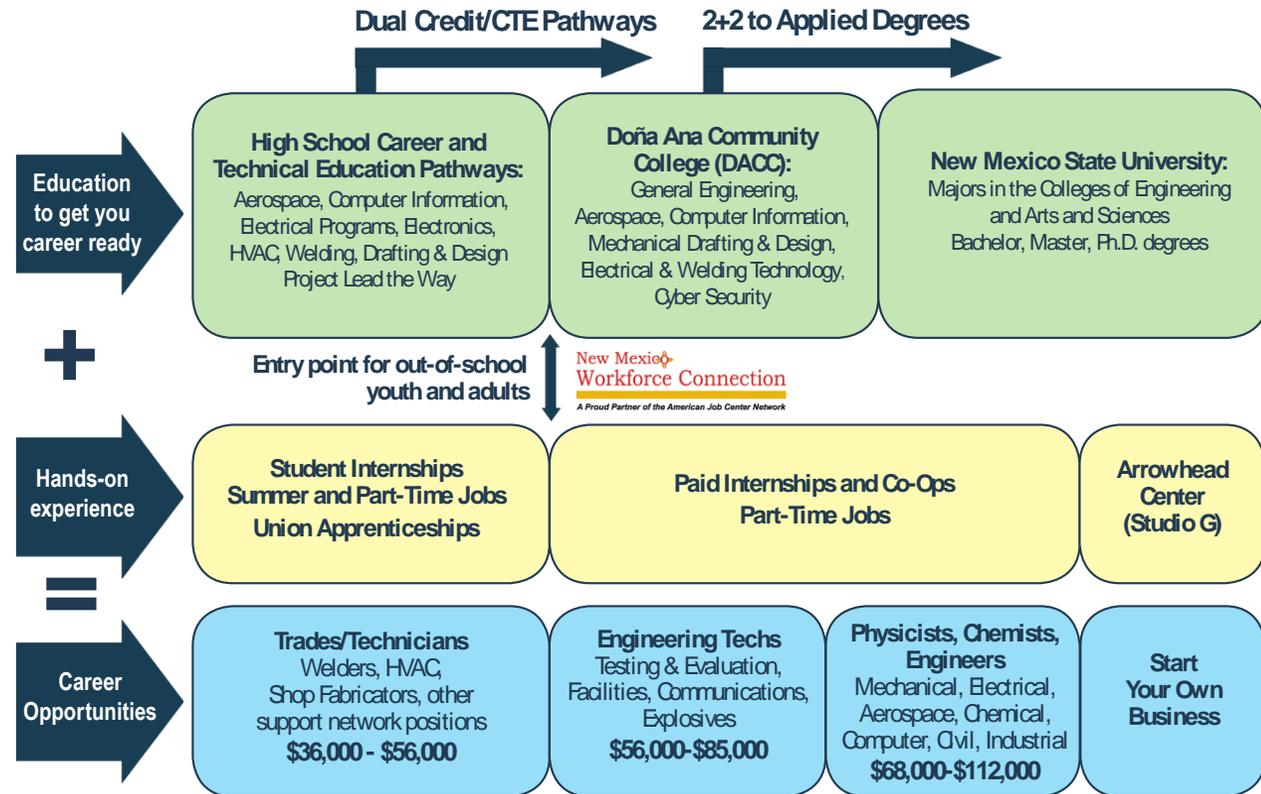
MAKING CTE MEANINGFUL

- Career Pathways - <https://www.careerpathways-nm.com/>
- CTE Student Organizations - <https://webnew.ped.state.nm.us/bureaus/college-career-readiness/career-technical-education/high-schools-that-work/>
- Career Cluster Guide Book - <https://webnew.ped.state.nm.us/wp-content/uploads/2020/09/State-NM-CCGB-2020.pdf>

Career Pathways in CTE



Aerospace, Space, and Defense Industries Pathways, Partners, and Positions

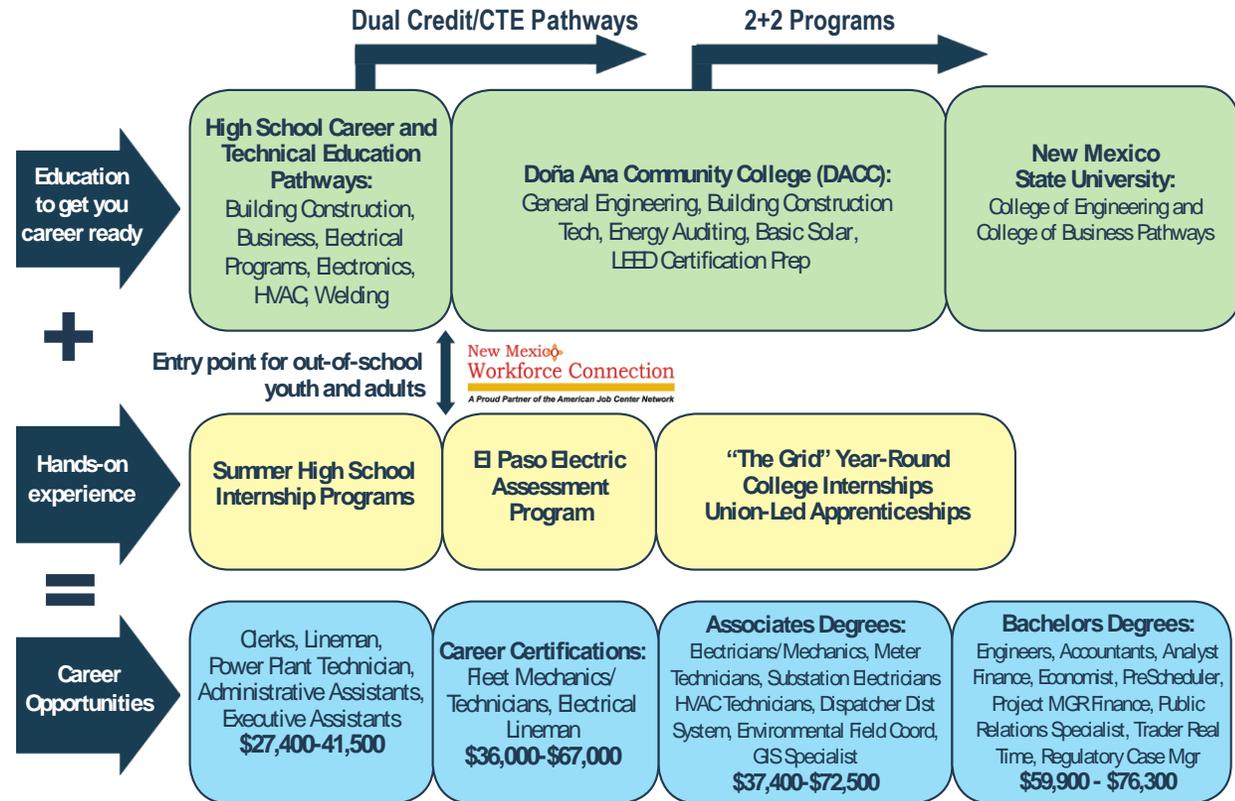


Career Pathways in CTE

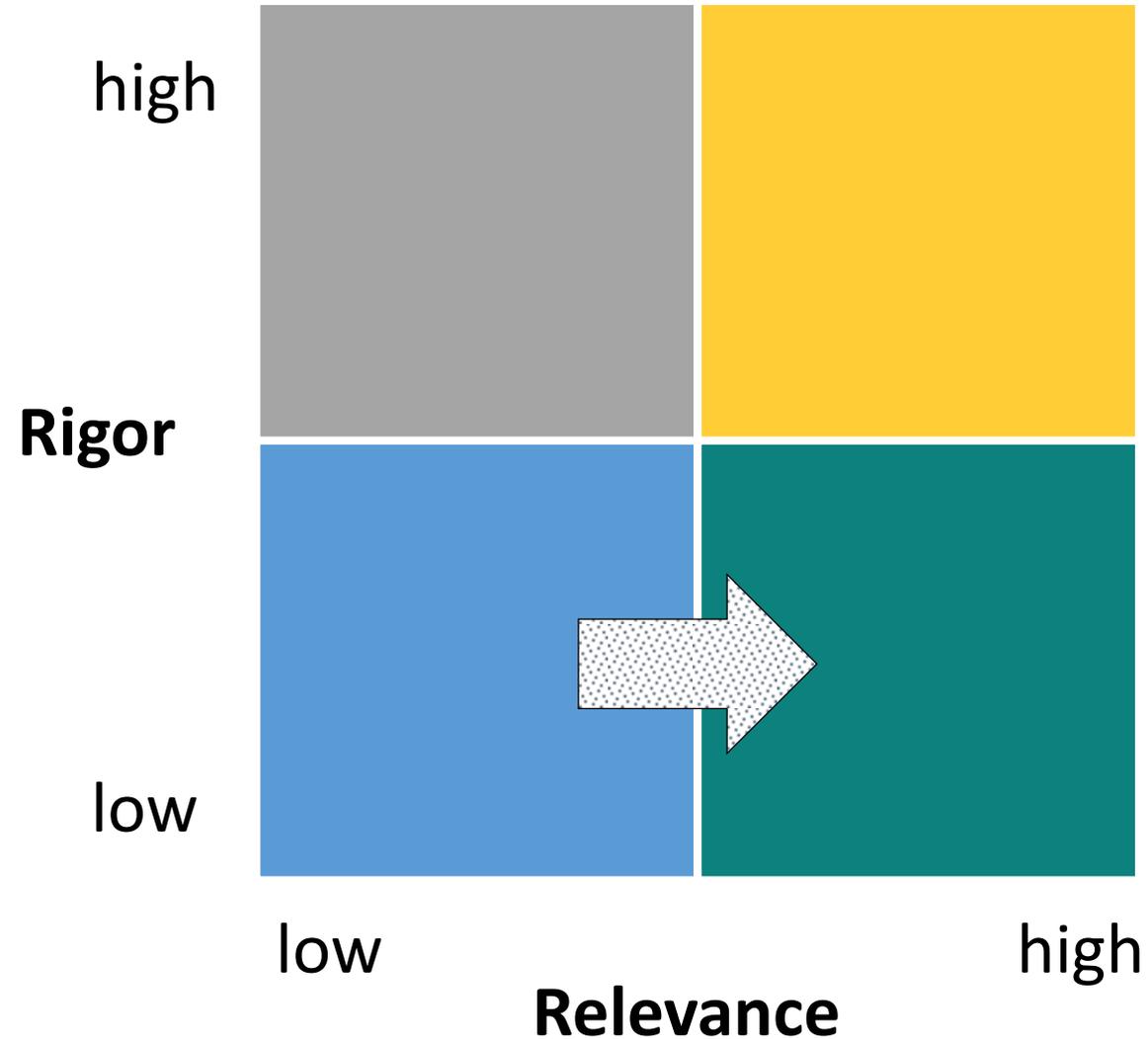


Energy Industry

Pathways, Partners, and Positions



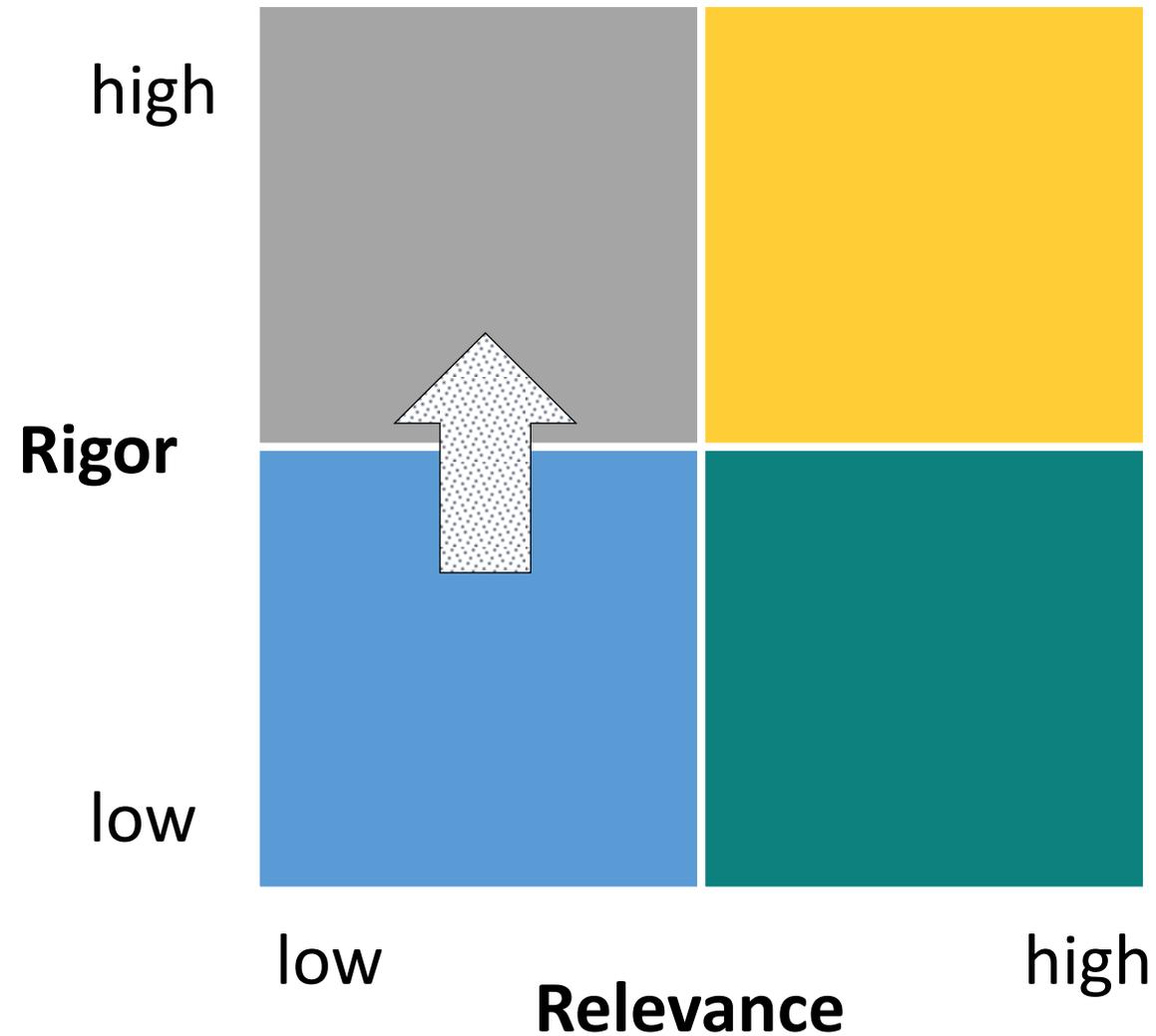
Traditional Vocational Education



Much of our work in CTE for the last several years has focused on moving up the relevance scale.

We've replaced traditional courses with industry-vetted versions that require application of learned skills.

College Ready - College Prep

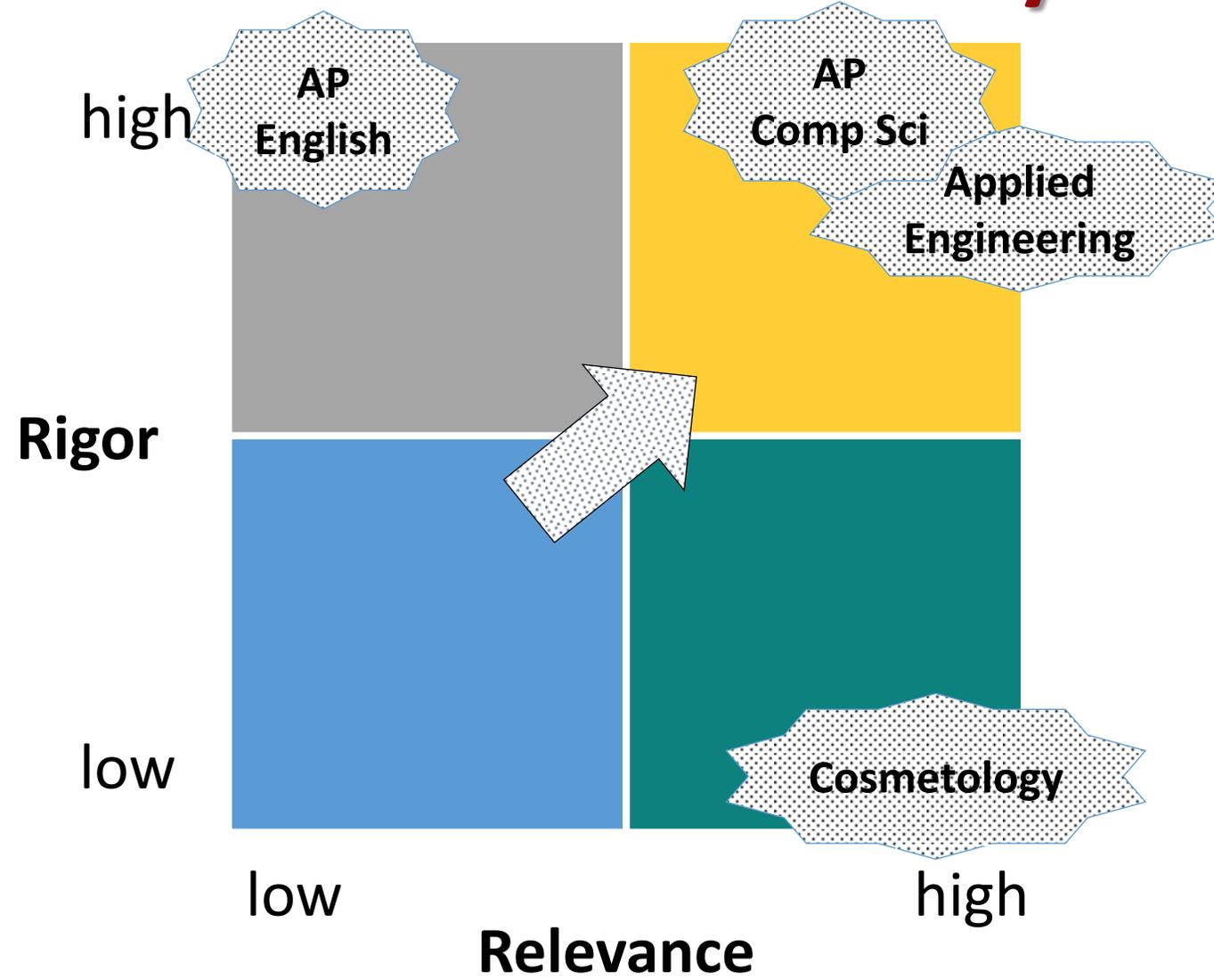


Literacy and numeracy are paramount.

College Prep IS Career Prep!

No matter how much education one gets, eventually the goal is a career, and all careers require core academic skills.

Career Ready



Balance the Equation: A Grand Challenge for Algebra 1



OVERVIEW

Algebra 1 is one of the most important on-track indicators of students' future success. For students who do not complete Algebra 1, their chances of graduating from high school are one in five. Black and Latino students, students who speak a language other than English, and students experiencing poverty in the United States are particularly affected by this, and the way our current systems are structured puts these students at a disadvantage in pursuing high-paying, in-demand careers. The system, as it is designed, discredits these students' lived experiences and it's time to make a change.

As it currently stands, Algebra 1 acts as a gatekeeper—rather than gateway—to future success. The Bill & Melinda Gates Foundation is seeking to work with partners to help us radically transform the experience of mathematics instruction by centering student identity and assets, and teachers' needs, in the design of visionary new solutions. For nearly two decades, the foundation has used Grand Challenges to address and solve key global health and development problems by seeking out and engaging the

world's brightest minds through an open and transparent process focused on the best ideas most likely to make an impact. We are launching our first-ever Grand Challenge focused on education in the United States, centered around the idea of making Algebra 1 a gateway, as one important effort to balance this uneven equation.

With the onset of COVID-19, students are facing an increasingly unpredictable and complicated world, and are even more likely to experience math classrooms that aren't designed to recognize and harness their strengths. Now is the right time to use the foundation's best asset for innovation to launch **Balance the Equation: A Grand Challenge for Algebra 1**.

This Grand Challenge is looking ultimately to identify up to 10 grantees who will each receive up to \$1M over two years to design solutions to make Algebra 1 more accessible, relevant, and collaborative for these priority students.

LESSON 3.2

Apply Reflections



CAREER SPOTLIGHT: Marine Engineer and Naval Architect

Occupation Description

Marine engineers and naval architects design, build, and maintain ships, from aircraft carriers to submarines and from sailboats to tankers. Marine engineers are also known as marine design engineers or marine mechanical engineers and are responsible for the internal systems of a ship, such as the propulsion, electrical, refrigeration, and steering systems. Naval architects are responsible for the ship design, including the form, structure, and stability of hulls.

Education

Programs in marine engineering and naval architecture typically include courses in calculus, physics, computer-aided design, fluid mechanics, ship hull strength, and mechanics of materials. Most programs also include time at sea, where students gain hands-on experience on a vessel.

Some marine engineering and naval architecture programs are offered at state maritime academies.

Potential Employers

The largest employers of marine engineers and naval architects are as follows:

Engineering services	25%
Federal government, excluding postal service	9%
Other professional, scientific, and technical services	7%
Transportation and warehousing	4%

Watch a video about marine engineers and naval architects: <https://cdn.careeronestop.org/OccVids/OccupationVideos/17-2121.00.mp4>

Career Cluster

Science, Technology, Engineering & Mathematics

Career Pathway

Engineering and Technology

Career Outlook

- Salary Projections:
Low-End Salary, \$65,440
Median Salary, \$92,400
High-End Salary, \$147,710
- Jobs in 2018: 11,700
- Job Projections for 2028: 12,700 (increase of 9%)

Geometry Concepts

- Describe reflections on a coordinate plane using functions.
- Apply reflections on a coordinate plane

Is this a good career for me?

Marine engineers and naval architects:

- Prepare system layouts and detailed drawings
- Inspect marine equipment and machinery
- Design and oversee the testing, installation, and repair of marine equipment
- Prepare cost estimates, contract specifications, and schedules

LESSON 2.3

Solving Linear Equations with a Variable on Both Sides



CAREER SPOTLIGHT: Accounting Clerk

Occupation Description

Accounting clerks produce financial records for organizations. They record financial transactions, update statements, and check financial records for accuracy.

Workers in this occupation engage in a wide range of tasks. Some are full-charge accounting clerks who maintain an entire organization's books. Others are accounting clerks who handle specific tasks. These clerks use basic mathematics (adding, subtracting) throughout the day.

Accounting clerks use specialized computer accounting software, spreadsheets, and databases to enter information from receipts or bills.

Education

Employers generally require accounting clerks to have some postsecondary education, particularly coursework in accounting. However, some candidates can be hired with a high school diploma.

Potential Employers

The largest employers of accounting clerks are as follows:

Professional, scientific, and technical services	13%
Retail trade	9%
Wholesale trade	7%
Healthcare and social assistance	7%
Finance and insurance	6%

Watch a video about accounting clerks: <https://www.youtube.com/watch?v=EsOkxSJEI0>

Career Cluster

Business Management & Administration

Career Pathway

Administrative Support

Career Outlook

- Salary Projections:
Low-End Salary, \$25,870
Median Salary, \$41,230
High-End Salary, \$62,410
- Jobs in 2018: 1,707,700
- Job Projections for 2028: 1,641,900 (increase of -4%)

Algebra Concepts

- Write linear equations with variables on both sides.
- Use properties of equality to solve linear equations with variables on both sides.

Is this a good career for me?

Accounting clerks:

- Use bookkeeping software, spreadsheets, and databases
- Receive and record cash, checks, and vouchers
- Produce reports, such as balance sheets, income statements, and totals by account

Session Synthesis



**Develop
Action
Plan**



**Support
Available via
Community
Forum**

Follow Up

Career and Technical Education Professional Learning Community

Next CTE
Meeting

November 10, 2020 at 9:00 a.m.

Topics and/or
Questions?

Email Joseph at jgoins@ns4ed.com



<http://www.echs-nm.com/>



jgoins@ns4ed.com



865-414-0033

Thank You
Contact Us