



COLLEGE READY • CAREER SKILLED • INNOVATION FUELED

PENNSYLVANIA *Career &*  
*Technical Education*

COLLEGE AND CAREER PATHWAYS FOR THE 21ST CENTURY



The mission of the Pennsylvania Department of Education is to lead and serve the educational community, to enable each individual to grow into an inspired, productive, fulfilled lifelong learner.



COMMONWEALTH OF PENNSYLVANIA  
OFFICE OF THE GOVERNOR



Dear Fellow Pennsylvanians,

Career and technical education (CTE) in Pennsylvania prepares students for today's dynamic and technology-driven workplace by offering more than 1,700 approved programs in over 200 schools<sup>1</sup>. At the foundation of every CTE program is the development of rigorous academic, technical, and employment skills to prepare students for both college and career.

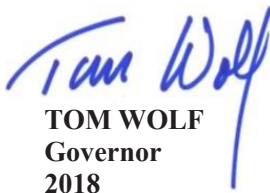
Pennsylvania's CTE students have tremendous opportunities and are held to high academic and technical skill expectations. Many earn industry-recognized credentials, early college credits, and real work experience in addition to meeting all graduation requirements. CTE students are expected to demonstrate proficiency on statewide academic assessments, and in addition, take a widely respected end-of-program technical assessment. Students thrive in career and technical education and are motivated to succeed because learning is relevant and meaningful; CTE connects what students are learning today to their personal goals and aspirations for tomorrow.

CTE students develop a range of significant, real world skills that prepare them for a successful transition to postsecondary opportunities. Participation in Career and Technical Student Organizations allows students to develop leadership skills, engage in community service, and compete in regional, state, and national competitions. Through ongoing and in-depth career exploration and planning, students make informed decisions about their future whether it includes college, a training or apprenticeship program, or immediate entry into a skilled career. CTE students leave high school with a clear vision of where they want to go next in life and what it takes to get there.

At the heart of Pennsylvania's robust CTE programs are skilled CTE educators who deliver engaging instruction aligned with academic standards and program competencies. In addition to having years of field experience, CTE educators also earn a Pennsylvania teaching certification and complete a rigorous induction program at the local level. Every CTE teacher receives ongoing guidance from members of their program's locally convened Occupation Advisory Committee.

The significant value that career and technical education provides extends to students, local communities, and the commonwealth. We are proud to offer young people high-quality career and technical education that prepares them to contribute to Pennsylvania's economy, the welfare and future of their local community, and their own financial independence.



  
TOM WOLF  
Governor  
2018

<sup>1</sup> As of March 2018, 1,762 approved CTE programs are offered in 219 schools: 108 career and technical centers, 110 district high schools, and one charter school.

# Pennsylvania's Career and Technical Education System

## *Changing Workforce Drives Program Improvement*

Pennsylvania's career and technical education (CTE) system is focused on providing young people with the skills, knowledge and habits needed to succeed in college and careers: a strong academic and technical foundation; opportunities to explore and experience careers; and, engagement in activities that develop employability skills.

In the past, students who were not planning to attend college were often guided toward vocational education programs leading to direct entry into the workforce. This model worked well for many years; high school graduates who attended "vo-tech" were typically able to secure low or middle skilled jobs offering a path to middle class with only a high school diploma and entry level skills. But the economy for which traditional vocational education was designed longer exists. Today's economy demands a workforce with more advanced academic and technical skills. Further, workers are expected to adapt quickly to changes in technology and have stronger communication, critical thinking, collaboration and creative skills.

Career and technical education in Pennsylvania has kept up with these changes by offering academically rigorous, technology-rich programs that prepare students for many postsecondary options. Today, a significant percentage of students enrolled in CTE programs pursue two- and four-year college degrees, and an increasing number begin accumulating college credits and industry-recognized credentials while still in high school. For others, CTE programs lead to competitive apprenticeship and training programs or direct entry into skilled careers that offer advancement opportunities.

### **CTE DELIVERY IN PENNSYLVANIA**

Since 2011-12, enrollment in CTE programs have increased by five percent, while overall high school public school enrollment has decreased by three and a half percent.

In 2018, there are 1,747 state-approved career and technical programs are offered to students in 84 regional career and technology centers (CTC) and 140 high schools in Pennsylvania. 16 of the CTCs operate as comprehensive high schools; students complete a CTE program and all other graduation requirements leading to a high school diploma in one building.

Additionally, approximately 1,000 postsecondary CTE programs (two-year degree programs) and 344 adult CTE programs (offering less than a two-year degree) are in operation.

The majority of CTCs in Pennsylvania operate as a shared time option; students spend about half of the day at the CTC engaged in a CTE program and the other half of the day at their home or "sending" high school where they take required academic courses and earn a high school diploma. Twelve CTCs operate as comprehensive high schools, meaning students may complete a CTE program and all other graduation requirements leading to a high school diploma.

There is no cost for students to participate in CTE programs at either a shared time or comprehensive high school and transportation from students' home high school to the regional CTC is provided at no cost to the student.

While the federal Carl D. Perkins Act authorized funding and program criteria to support CTE programs, Pennsylvania provides a critical state investment of approximately \$62 million in funding for CTE, including some funding for competitive equipment grants and adult training. At the local level, approximately five percent of a CTC's budget comes from Carl D. Perkins federal funds (amount varies regionally due to demographics), 10 percent or less comes from State Career and Technical Education Subsidy and 85 percent or more comes from member school districts.

### **THE STORY OF CTE**

CTE is more than programs, buildings and funding; it's people - students, parents, educators and employers - working together to prepare learners for their future. The remainder of this brochure tells more about the story of Pennsylvania's outstanding career and technical education.

# Jayden Todd

Jayden Todd is certain that attending Berks Career and Technology Center's Mechatronics Engineering Technology program is giving him a head start on his college and career plans. In fact, Jayden is already earning college credit through dual enrollment. As a senior, Jayden is wrapping up his third and final year in Mechatronics Engineering Technology and plans to major in engineering or a related field at a four-year university.

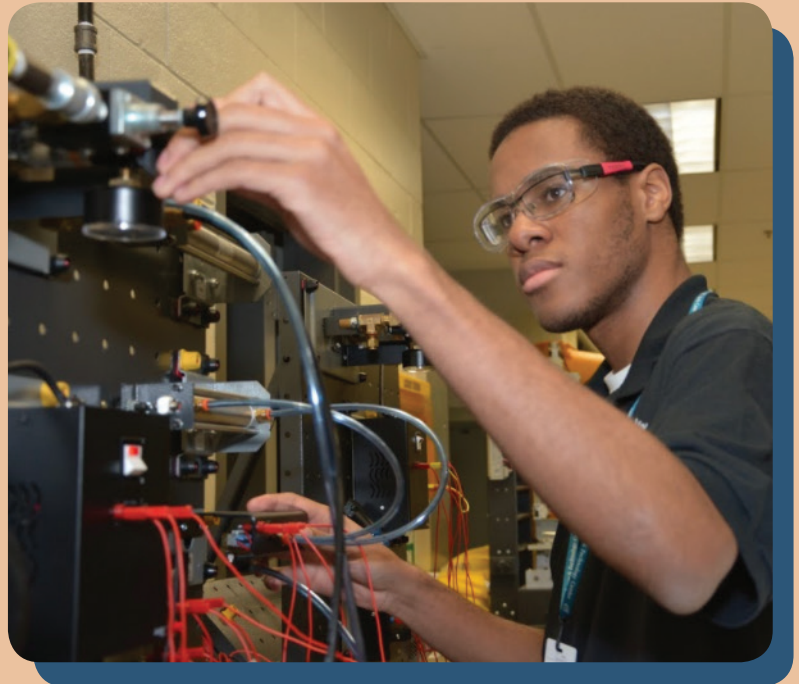
Jayden's interest in engineering prompted him to join the Technology Students Association (one of many Career Technology Student Organizations, known as CTSOs) at his home school. When he learned about Berks Career and Technology Center's (BCTC) half-day mechatronics program, Jayden decided to give it a try and never looked back.

**"One aspect of the program that I really enjoy is hands-on learning, using the same equipment that professionals use. Right now, I'm working on my senior project which involves the conceptualization, design and building of a remote control robot. It's a collaborative project that BCTC students will work on for the next few years."**

Hands-on learning is integrated with instructor-led theory lessons. Online tutorials focusing on 3-D printing are also available to students.

According to Jayden's teacher, Mr. Charles Stricker, "The Mechatronics Engineering Technology Program is ideal for students interested in electronics, electrical engineering, mechanical engineering and robotics and

automation system design. Our classroom is a state-of-the-art lab where theory and principles come together through hands-on learning, computer-based lessons, use of technical equipment and student-created projects. At BCTC, this program is also part of our Technical Academy which gives students the opportunity to earn college credits and begin building a college transcript."



BCTC isn't the only place Jayden may engage in learning. After hearing him speak before 350 employers and educators at a symposium, the CEO and president of the region's largest employer invited Jayden to participate in an internship before he graduates. Not surprisingly, Jayden welcomes the opportunity. A high-achieving student at his home school, at BCTC Jayden is a member of the National Technical Honor Society and Skills USA (another CTSO), organizations that offer opportunities to develop employability and leadership skills through community service, skills competitions and other activities.

What does Jayden recommend to students interested in career and technical education programs? "Go for it! Get a start on your career. BCTC has definitely been the right choice for me."

# Building Tiny Houses Offers Real World Experience for CTE Students

*In response to a popular national trend, students at Lancaster County Career and Technology Center designed and built a tiny house in order to apply academic, technical and employability skills to a real world project.*

The yearlong endeavor involved nearly 200 students from various CTE programs including **Plumbing; Electrical Construction; Cabinetmaking and Wood Technology; Architectural CAD/Design; Painting; Ceramic Tile and Vinyl;** and, **HVAC/R.** In addition to their specific trade area, students practiced problem solving, communication, critical thinking and other in-demand employability skills.

Authentic learning leads to student engagement and success, and the majority of students who participated in the project scored Competent or Advanced on their end-of-program NOCTI exam, a nationally recognized assessment taken by CTE program completers. Further, nearly all students earned at least one industry-recognized certification in their technical

program area. Many of the students involved in the project also participated in cooperative learning - part-time employment coordinated through the school and during school time that often leads to full-time employment after graduation.

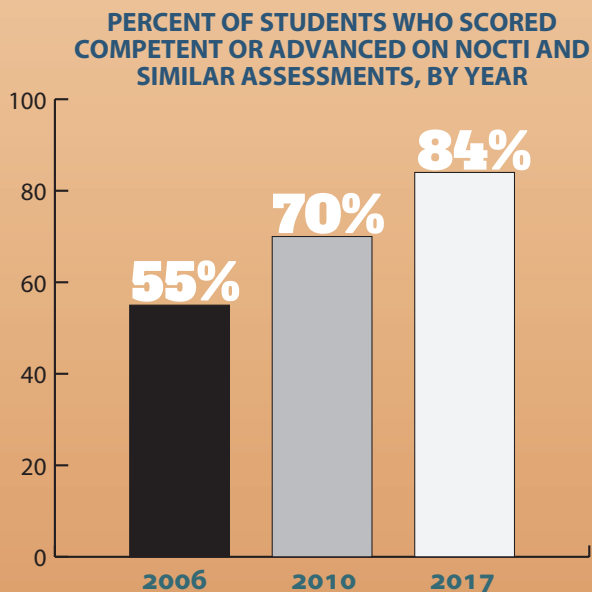
The school's tiny house was displayed and marketed at regional events such as the Lancaster Spring Home Show where it received positive attention.



# GETTING RESULTS

## TECHNICAL SKILL ATTAINMENT

All students in the commonwealth, including those enrolled in CTE programs, are expected to demonstrate proficiency on state required academic assessments. In addition, students on track to complete a CTE program sit for an end-of-program assessment to demonstrate achievement of technical skills and knowledge. In most programs, an exam developed by NOCTI, a national skill assessment organization, is used for this purpose. Statewide, the percentage of students scoring Competent or Advanced on NOCTI and other assessments continues to increase:



This steady increase may be attributed to a continuous cycle of CTE program reviews, professional development and leadership development provided in large part through the state sponsored Pennsylvania Technical Assistance Program (see below).

## INDUSTRY CERTIFICATIONS

In addition to obtaining in-demand technical skills, CTE students have the opportunity to earn industry-recognized certifications. In 2016-17, 29 percent of CTE students earned at least one certification. In total, students earned 35,132 certificates during that school year. Employers value these certifications and may

give greater consideration (and higher starting pay) to candidates who hold them.

## CAREER EDUCATION AND WORK STANDARDS

A significant goal of CTE is that students gain broad and transferable skill sets as well as the capacity to adapt to changing technologies and job responsibilities. To further support the development of a well-educated and skilled workforce, Pennsylvania Department of Education requires all public schools to integrate approved Academic Standards for Career Education and Work (CEW). These CEW standards describe what students should know and be able to do in four areas: Career Awareness and Preparation; Career Acquisition; Career Retention and Advancement; and Entrepreneurship. While these standards apply to all schools, by the very nature of their programs, CTE teachers have been integrating these concepts into program curriculum and classroom experiences for many years.

**Graduation Rates: In school year 2016-2017, 99 percent of Pennsylvania CTE students who successfully completed at least 50 percent of their CTE program graduated from high school.**



# Supports for CTE Programs, Educators and Students

## Pennsylvania Technical Assistance Program: Improving Academic and Occupational Achievement in Career and Technical Education

The Pennsylvania Department of Education (PDE), Bureau of Career and Technical Education (BCTE) facilitates an ongoing statewide initiative intended to increase the quality and impact of CTE programs and assure that they align with the commonwealth's economic and workforce development priorities. Two key goals of the initiative are to increase academic and occupational achievement and success for all CTE students.

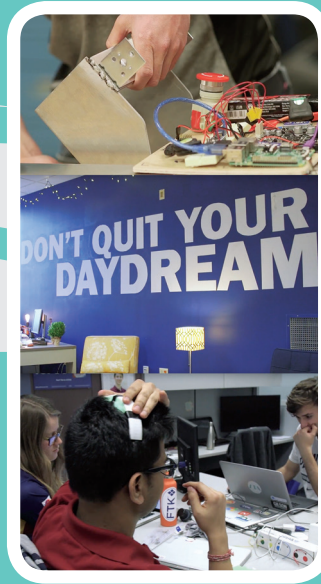
Supporting these goals is a Technical Assistance Program (TAP) that offers participating schools multiple services to address locally identified areas in need of improvement. A designated Career and Technical Distinguished School Leader (CTDSL) is assigned to each school and acts as an improvement coach for teachers and administrators. Through TAP, teachers engage in professional learning opportunities that drive improvements in instruction, and administrators participate in leadership classes to further develop their capacity and effectiveness.

Career and Technical Education Promising Practices Effective and innovative practices are taking place in CTE around the commonwealth. To capture and share these practices, BCTE supports the Pennsylvania CTE Resources website (<http://www.pacteresources.com>). This website documents hundreds of promising practices that are taking place in the classroom, school or region and are believed to contribute to improved student results. Dedicated to the notion that successes should be recognized and replicated, the goal of this resource is simple: CTE educators can learn from one another and, in doing so, improve students' educational experiences and opportunities.

### JOINT OPERATING COMMITTEES

A Joint Operating Committee (JOC) that acts as a school board governs each regional Career and Technology Center. JOC members are drawn from the school boards of the districts that are permanent members of the CTC. This ensures that member school districts have a direct stake in governance of the CTC. Additionally, a

superintendent from one of the member school districts is designated the CTC's Superintendent of Record; this responsibility typically rotates among the member school district superintendents each school year.



### OCCUPATIONAL ADVISORY COMMITTEES

Offering teachers and administrators industry-related guidance regarding CTE program curriculum, equipment and workplace trends, a locally convened occupational advisory committee (OAC) is in place for every CTE program. OAC members are leaders in their field and provide a vital link between CTE programs and business and industry.

### CAREER AND TECHNICAL STUDENT ORGANIZATIONS

Career and Technical Student Organizations, or CTSOs, are an integral part of the CTE experience. These not-for-profit organizations, authorized by the U.S. Congress in the Perkins Act, align with career clusters and career pathways. Each CTE program in Pennsylvania is connected to at least one CTSO allowing over 70,000 students to participate in more than 1,000 local chapters.

Relevant and engaging CTSO activities are integrated into curriculum and extra-curricular activities. Through CTSO involvement, students develop and enhance many career, leadership, employability and life skills that contribute to being a productive member of the workforce and society. According to a National Research Center for CTE report, the more students participate in Career Technical Student Organization activities, the higher their academic motivation, academic engagement, grades, career self-efficacy, college aspirations and employability skills.<sup>2</sup>

### NATIONAL TECHNICAL HONOR SOCIETY

Students' academic and technical achievement is recognized through the highly competitive National Technical Honor Society. To be considered for induction, students meet rigorous criteria including an overall grade point average of 3.0 or higher on a 4.0 scale.

2 Alfred et al., Looking Inside the Black Box: The Value Added by Career and Technical Student Organizations to Students' High School Experience, National Research Center for CTE, 2007

# Where are the **JOB**S?

Many Americans are surprised to learn that a majority of our nation's jobs demand "middle skills," and these are often obtained through two-year technical degrees and training programs. Clearly, a traditional four-year college degree is not the only path to middle and high skill careers paying family-sustaining wages. Consider the following data:<sup>3</sup>

- According to the National Skills Coalition, about 50 percent of all jobs in Pennsylvania are considered middle skilled, and that percentage is slightly higher than the national average of 48% middle skilled jobs.<sup>4</sup>
- Across the nation, 30 million jobs offering an average salary of \$55,000 a year do not require a bachelor's degree.
- By 2020, 65 percent of all jobs in the U.S. are expected to require at least some postsecondary education: 35 percent of job openings will require at least a bachelor's degree and 30 percent will require some college or an associate's degree.
- 31 percent of young workers with an associates degree earn more than those with a bachelor's degree.
- 27 percent of young workers with licenses and certificates earn more than those with a bachelor's degree.

3 A. P. Carnevale, et al. Recovery: Job Growth and Education Requirements Through 2020. Georgetown University Center on Education and the Workforce, 2013

4 National Skills Coalition. <https://www.nationalskillscoalition.org/resources/publications/2017-middle-skills-fact-sheets/file/Pennsylvania-MiddleSkills.pdf>

Examples of careers requiring less than a four-year degree include the following:<sup>5</sup>

## ASSOCIATE'S DEGREE:

	Entry Level Annual Wage	Average Annual Wage
Registered Nurse	\$50,560	\$67,550
Computer Programmer	\$48,360	\$78,830
Dental Hygienist	\$48,060	\$62,830
Electrical Engin. Tech	\$38,240	\$55,620
Paralegal	\$34,520	\$53,390
Cardiovascular Tech	\$33,160	\$51,850
Web Developer	\$38,160	\$62,830
Construction Manager	\$65,400	\$115,520

## SOME POSTSECONDARY TRAINING OR ON-THE-JOB TRAINING:

Cement Mason	\$30,960	\$46,640
Construction Equipment Operator	\$33,150	\$47,900
Pipelayer	\$36,440	\$51,150
Correctional Officer	\$35,600	\$50,380

5 Retrieved March 2018 from the Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis <http://www.workstats.dli.pa.gov/Documents/PA%20IDOL/PA%20IDOL.pdf>





## Linking CTE to Pennsylvania's

# High Priority Occupations

**To compete regionally, nationally and globally, Pennsylvania needs skilled workers to fill positions in high priority, high impact industries.**

Even during a severe economic downturn, some skilled jobs go unfilled because there is not a sufficient supply of prepared workers, while in other industries and occupations there may be more skilled workers than available jobs. The problem is even more pronounced during a time of high overall employment.

**While this is an ongoing challenge, CTE leaders work to keep pace with the ebb, flow and evolution of job market demands and industry changes by maintaining a tight alignment between the CTE programs offered to students and the current industry demands as this is in the best interest of students and the economy.**

The Pennsylvania Departments of Labor and Industry, Community and Economic Development and Education worked together to identify industry sectors impacting employment opportunities in the commonwealth. It was determined that twelve industry clusters – groups of industries that are linked by similar product markets, labor pools, supply chains and other economic ties – account for nearly 82 percent of all employment in the commonwealth<sup>6</sup> (see next page). This information helps drive the creation of new CTE programs as well as determine when an existing program no longer offers viable job opportunities.



<sup>6</sup> Pennsylvania Department of Labor and Industry Center for Workforce Information and Analysis, retrieved March 2018, <http://www.workstats.dli.pa.gov/Products/PAIndustryClusters/Pages/default.aspx>

# Pennsylvania's 12 Targeted Industry Clusters<sup>7</sup>

An industry cluster consists of a group of industries that are closely linked by common product markets, labor pools, similar technologies, supplier chains, and /or other economic ties. Clusters can take on strategic importance because activities that benefit one group member will generally have positive spillover effects on other members of the cluster.



Nine industry clusters, with critical sub-clusters, have been identified for workforce strategies. These nine clusters account for nearly 69 percent of all employment in the Commonwealth.

## ADVANCED MANUFACTURING

- Welder
- Machinist
- Production Supervisor

## HOSPITALITY, LEISURE & ENTERTAINMENT

- Culinary Chef
- Amusement and Recreation Attendant
- Customer Service Representative

## AGRICULTURE & FOOD PRODUCTION

- Veterinarian
- Environmental Engineer
- Food Scientist

## ENERGY

- Drill Operator
- Maintenance and Repair
- Operations Manager

## BIOMEDICAL

- Chemist
- Industrial Engineer
- Medical and Clinical Laboratory Technologist

## HEALTH CARE

- Nurse
- Mental Health Counselor
- Medical Secretary

## BUILDING & CONSTRUCTION

- Carpenter
- Electrician
- Plumber

## REAL ESTATE, FINANCE & INSURANCE

- Insurance Sales Agent
- Loan Officer
- Personal Financial Advisor

## BUSINESS SERVICES

- Accountant
- Sales Manager
- Securities, Commodities and Financial Services Sales Agent

## WOOD, WOOD PRODUCTS & PUBLISHING

- Prepress Technician
- Graphic Design
- Cabinetmaker

## EDUCATION

- Teacher or Teacher Assistant
- Bus Driver
- Office Staff

## LOGISTICS & TRANSPORTATION

- Tractor Trailer Truck Driver
- Cargo and Freight Agent
- Packer and Packager

<sup>7</sup> Pennsylvania Department of Labor and Industry Center for Workforce Information and Analysis, retrieved March 2018, <http://www.workstats.dli.pa.gov/Products/PAIndustryClusters/Pages/default.aspx>

# *“Pink Out Week”* at Susquehanna County Career and Technology Center

Cosmetology students at Susquehanna County Career and Technology Center (SCCTC) practice technical and employability skills while raising money for the American Cancer Society Relay for Life. Pink Out Week, started in 2007, takes place the last week of every October. During this much-anticipated event, students provide exciting cosmetology services to Elk Lake Elementary students in the SCCTC cosmetology lab.

With parental permission, elementary student choose from age-appropriate services such as pink glitter manicures, temporary tattoos and unique hair braiding. A reasonable donation is suggested for each service with all profits going directly to the American Cancer Society. Each year, between 500 and 600 elementary students purchase services, resulting in more than a \$1,000 annual donation to the charity.

Pink Out Week is a win-win for all involved. Cosmetology students practice technical and customer service skills in a low-pressure and fun environment while also contributing to a worthy cause. Elementary students are excited to be pampered and get a glimpse into career and technical education.



# EMERGING ENERGY AND INFRASTRUCTURE TRAINING AT CENTRAL PENNSYLVANIA INSTITUTE OF SCIENCE AND TECHNOLOGY

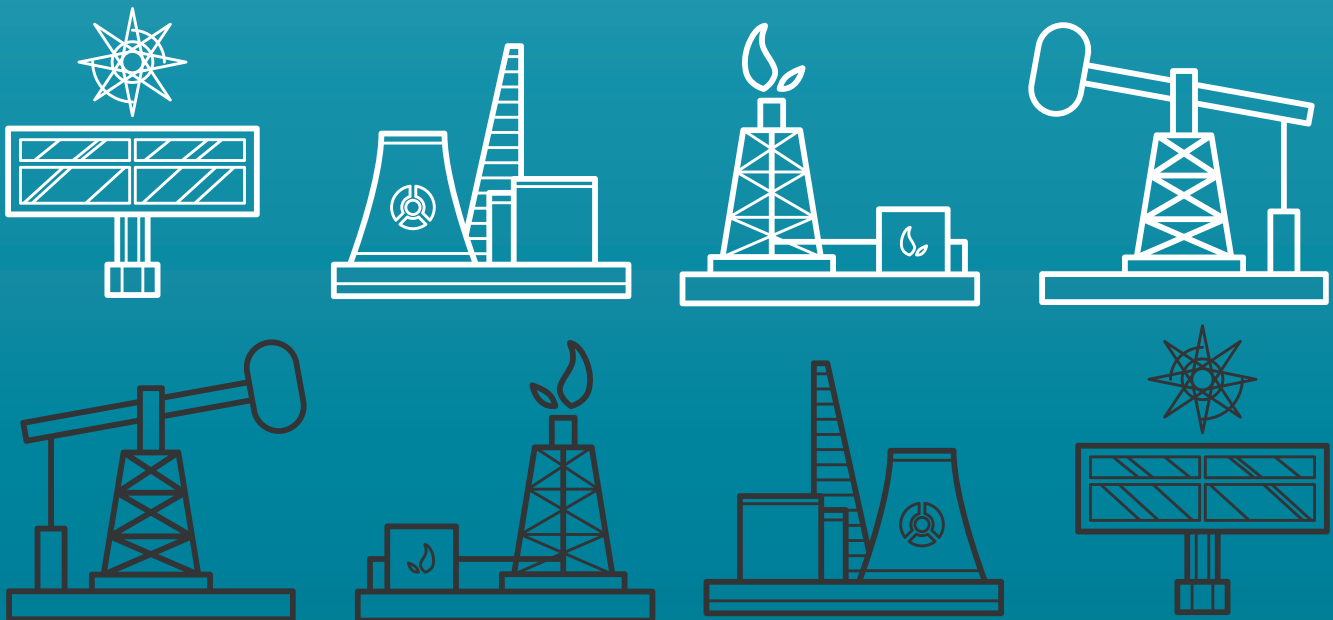
In response to the region's hydraulic fracturing ("fracking") for natural gas extraction, Central Pennsylvania Institute of Science and Technology's (CPI) has developed an Emerging Energy and Infrastructure Training Program that provides training for careers in fields related to natural gas processing, renewable energy, advanced manufacturing, water quality management and other industries.

Regionally, manufacturing is in high demand due in large part to Marcellus Shale fracking for natural gas extraction. In fact, it is estimated that as many as 70 percent of the job openings in central Pennsylvania are for skilled technicians. As a result of this demand and after several years of planning, including an

assessment of CPI's strengths and the industry's needs, the program was implemented.

Students in the program develop technical, academic and employability skills that are in high-demand. Innovative learning methods are embedded and include authentic industry equipment supported by one-on-one interaction with instructors, well organized written curricula and a website that provides animations, videos, virtual trainers and online skill building exercises.

The Emerging Energy and Infrastructure Training Program includes certificate programs in water and wastewater, natural gas, solar power and wind power and offerings in industrial maintenance, electromechanical and mechatronics. Through this program, CPI provides a much-needed pipeline of qualified technicians and, equally important, is having a direct impact on the quality and effectiveness of the current workforce, helping companies be more successful and competitive.

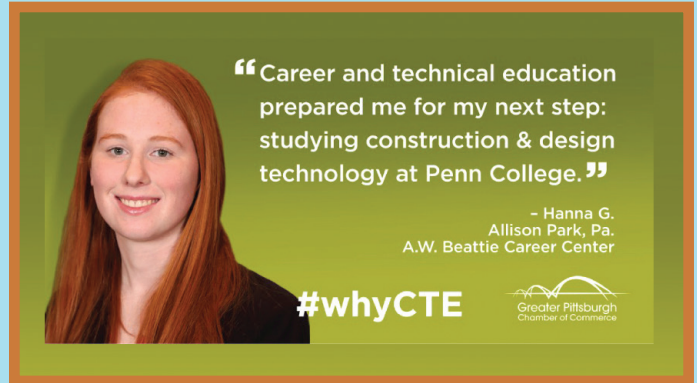


# Hanna Gibson

A. W. Beattie Career Center's Carpentry/Building Construction Program provided Hanna Gibson with experiences and preparation typically not included in a high school education. Hanna, a 2017 graduate, contends, "Not only did I get real work experience in a field that interested me, but I was also better prepared for college." CTE enriched Hanna's overall high school experience. "It didn't stop me from doing the things other high school students did. I still participated in my home school's marching band and played lacrosse. At A. W. Beattie, I was a member of SkillsUSA and competed at the state and national level. I had the best of both worlds in both schools." Hanna was also a member of the National Honor Society and National Technical Honor Society.

Engaging in CTE for two hours daily allowed Hanna the time needed to learn new technical skills and build a positive relationship with the instructor. "The teachers at the career center make you feel like you're one of their own. They tell you when you're doing great, and they tell you when you need to step it up. They invest in you and your future." Through a summer job in construction, Hanna earned "good money" and made connections with employers in the field who, along with program instructor Mr. John Brown, mentored Hanna as she made the decision to pursue construction as a career path.

Hanna is a full-time student at Pennsylvania College of Technology (PCT) where she majors in Building Construction and minors in Construction Management. At PCT, Hanna "watched fellow students who didn't attend CTE struggle with the simplest tasks. I knew what to expect in my college program, and I have the foundation to succeed at PCT because I attended A. W. Beattie." While in college, Hanna is continuing her commitment to extracurricular activities by participating in clubs such as Penn College Woman in Construction, Penn College Construction Association and Skills USA Alumni. Her ongoing commitment to academics has landed Hanna on PCT's Dean's List.



By participating in a career program at A. W. Beattie Career Center, especially one dominated by male students, Hanna feels she developed greater self-confidence and important life skills including the ability to set goals and reach them; time management; interpersonal communications; and teamwork.



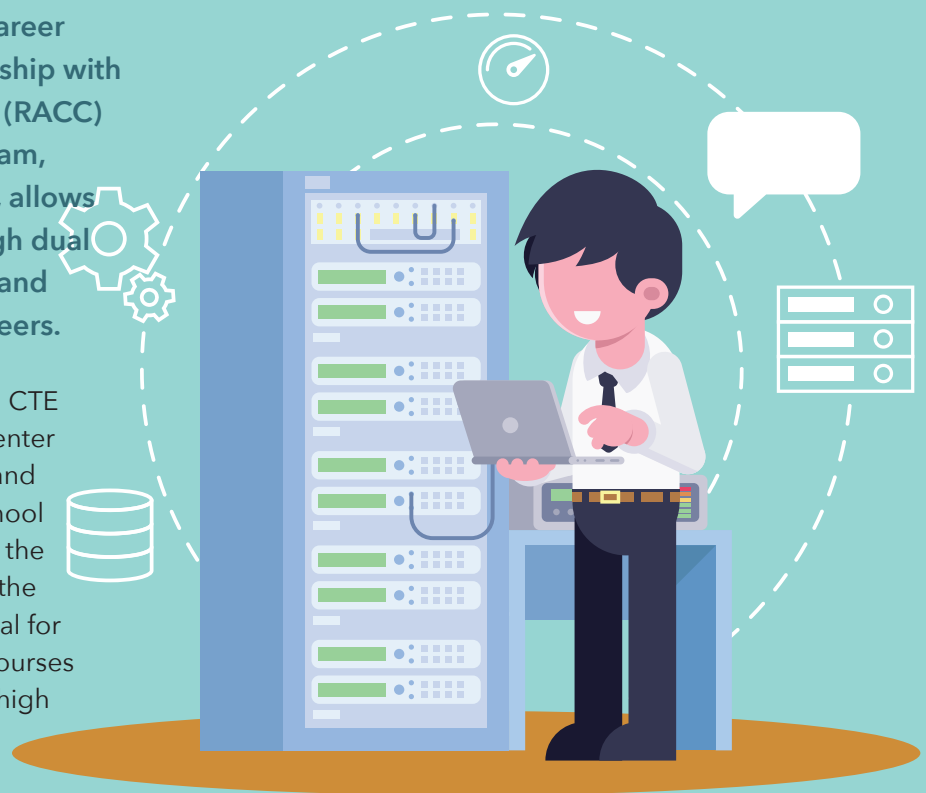
# Berks County Technical Academy

Imagine graduating from high school with 27 credits on a college transcript. Beginning as early as grade ten, students attending Berks Career and Technology Center (BCTC) and Reading Muhlenberg Career and Technology Center (RMCTC) may enroll in the Technical Academy, an innovative college and career pathway program designed in partnership with the Reading Area Community College (RACC) and Bloomsburg University. The program, open to students in three career areas, allows students to earn college credits through dual enrollment courses, saving them time and money on their path to in-demand careers.

Thanks to extensive collaboration between CTE and college staff, career and technology center instructors use RACC curricula, textbooks and assessments to teach the courses. High school seniors may earn additional credits toward the associate degree by attending courses on the community college campus. It is not unusual for students to complete half or more of the courses required for the associate degree while in high school.

After high school graduation, Technical Academy students are expected to complete the two-year degree at RACC. With this achieved, they may enter the workplace or complete a Bachelor of Applied Science in Technical Leadership from Bloomsburg University. A significant benefit is that students may earn the bachelor's degree without moving to Bloomsburg; all required courses are offered on the RACC campus at a fraction of the state university tuition rate. The Bloomsburg University courses are offered during day and evening hours and some are available online.

The Technical Academy is an outstanding example of innovation in Pennsylvania's career and technical education.



## Technical Academy Entrance Requirements

**STUDENTS MUST BE IN GRADES 10 OR 11**

- 3.0 overall GPA (unless special permission is granted)
- Must be math and reading proficient
- Must remain in a college prep academic sequence throughout high school
- Sign a Letter of Understanding to attend RACC to earn an associate degree

## Best Practice Profile

# Culminating Career Portfolios at Dauphin County Technical School

As part of the Dauphin County Technical School (DCTS) curriculum, each student is expected to complete a Culminating Career Portfolio by the end of senior year. Implemented over a decade ago, the portfolio ensures that all DCTS students develop effective plans for a successful future; skills necessary for post-secondary success; and, a tool to use during the job application and interview process.

The portfolio is introduced during the required Freshman Seminar and consists of four major components:

### **COMPREHENSIVE CAREER AND TECHNICAL BEST WORKS**

Students self-select their best work, commensurate with the highest level of competency attained in the program area each year. Students also include written explanations and reflections designed to prompt self-assessment and evaluation of critical academic, career and technical and career education skills.

### **INTERVIEW AND SENIOR EXIT SURVEY**

In an effort to improve job interview skills, students participate in mock interviews conducted by business and industry leaders in their junior year. As seniors, students are required to complete an exit survey.

### **ACQUISITION DOCUMENTS**

Students are required to research careers, plan courses, identify personal strengths and weaknesses related to careers and document their progress as they do so. Throughout high school, students complete a career inventory, create a resume, write a cover letter and develop other documents related to professional and career communication.



### **COMMUNITY SERVICE**

Students secure and complete twenty hours of community service (five hours per year). DCTS administrators provide assistance with finding opportunities when needed.

Students are provided extensive support and resources as they work on their portfolio. The project is directed and monitored by a team of educators and local employer. DCTS administrators feel strongly that the Career Culminating Portfolio provides an opportunity for every student to receive instruction, guided practice, independent practice and mentoring in career acquisition and retention skills.



# Creating Programs of Study

## to Link CTE, Core Academics, Postsecondary Education and Training

An important element in Pennsylvania's CTE design is the link between CTE and academic courses and between high school and postsecondary education. These connections are meant to develop students' college and career readiness and a seamless transition into postsecondary education and training. This is organized through well-planned CTE Programs of Study.



### **EACH STATE-APPROVED CTE PROGRAM OF STUDY MUST ADHERE TO THE FOLLOWING:**

- Align to High Priority Occupations as identified by the PA Department of Labor and Industry
- Align to PA Academic Standards
- Articulate to postsecondary institutions, providing opportunities for students to articulate college credits and/or earn credits through dual enrollment
- Utilize an approved competency list
- Offer opportunities for students to obtain industry-recognized credentials when possible
- Align to an end-of-program technical assessment
- Further, CTE teachers must have field experience, earn a Pennsylvania teaching credential and meet all other teaching requirements.





# Pennsylvania Recommended Career Plan of Study

## Cluster: Production Occupations • Pathway: Advanced Material and Diversified Manufacturing (AMDM): Machine Tool Technology

GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	CAREER/TECHNICAL EDUCATION	INDUSTRY CERTIFICATIONS
<b>Middle School Cluster: Production Occupation</b>						
7	English 7	Math	Gen Science	Social Studies	Choose personal electives and extra curricular activities based upon personal career interests, abilities and academic strengths.	None
8	English 8	Algebra I	Gen Science	Social Studies	Choose personal electives and extra curricular activities based upon personal career interests, abilities and academic strengths.	None
<b>High School Pathway: Advanced Materials &amp; Diversified Manufacturing</b>						
9	English I	Geometry	Earth & Space	American History I	Explore occupation based upon interest assessment. Learn about employment outlook information, hiring outlook, and wage information.	None until Grade 12
10	English 2	Algebra II	Chemistry	American History II	Precision Machining program of study includes: safety, layout work, part inspection, bench work activities, operating a drill press and grinding machine.	None until Grade 12
11	English 3	Trig/Algebra III	Physics	Government Civics and Economics	Precision Machining POS includes: lathe operation, milling machine operation, power saw operation, maintenance of precision machines and tools, metallurgy, use of charts and references, reading blueprints, Computer Numerically Controlled (CNC) Programming.	None until Grade 12
12	English 4	Calculus	Environmental Science	World History	Precision Machining POS includes: additional training in Computer Numerically Controlled (CNC) Programming, metallurgy, use of charts and references, reading blueprints.	National Institute For Metalworking Skills (NIMS) Level I certification

Students attending a part-time career and technical center are provided with transportation to and from their home high school. Due to school schedules, students sometimes take one core academic course at the career and technical center. In most cases, students are able to participate in extra-curricular activities such as sports, theater or clubs at their sending high school.

## Best Practice Profile

# Lenape Technical School Biomedical Technology Programs

Students at Lenape Technical School in Ford City have the opportunity to enroll in a BioMedical Technology Program, one of only a few such programs in the state. This three-year program, part of the school's health care occupations cluster, prepares students for postsecondary education and careers in the high-demand health care fields as well as biotechnological, clinical, forensic and research laboratories.

Involving more than an introductory health program, students gain a substantial background in biotechnology, anatomy and physiology, medical terminology, pharmacology, immunology, microbiology, genetics, forensics and bioethics. Hands-on training in laboratory techniques used in the clinical, biomedical research and forensic settings are a significant part of the program. Students may earn several industry-recognized certificates including American Heart Association CPR.AED, Bloodborne and Airborne Pathogens and AHA First Aid. Training for the Pharmacy Technician certification is included in the course, preparing students to sit for the exam upon graduation.

The program is designed as a college preparatory sequence of courses, and students in the program are typically enrolled in honors-level academic classes. The core program is completed in two years; a third year is dedicated to independent study.

Upon graduation, some students choose to pursue postsecondary education at a bachelor's degree, while others may complete an associate's degree or



a diploma program that provides opportunities for entry-level employment in health care professions in smaller systems and medical practices within surrounding communities. With that in mind, the program also includes components that foster preparation for job opportunities typically available in residential and rural communities, such as medical technologist, surgical technician, practical nurse or veterinarian technician.

An advisory committee of various stakeholders, including local biotechnology professionals and faculty from Penn State, the Community College of Allegheny County and Butler County Community College provided guidance when the program was designed.

Throughout the program, students experience several dynamic out-of-school learning opportunities, including a visit to a large hospital where they observe open-heart surgery and participate in a tour of the animal research facility at the University of Pittsburgh.

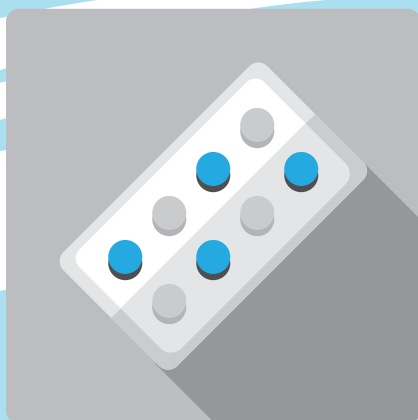


Image Credit: Vecteezy

As depicted in this brochure, career and technical education in Pennsylvania is engaging, innovative and systematically organized. Through CTE curricula and activities, our youth gain in-demand technical and employability skills that serve them well in college, career and life.

We look forward to continually improving CTE for our students, their families and our economy. If you have questions about career and technical education, please do not hesitate to contact me or one of our regional career and technical centers.

Best wishes,

**Lee Burket, Ed.D.**

Director, Bureau of Career and Technical Education  
717.787.5530  
lburket@pa.gov

## Key Pennsylvania CTE Contacts

**Pennsylvania Association of Career & Technical Administrators (PACTA)** • [www.pacareertech.org](http://www.pacareertech.org)

**Pennsylvania Association for Career and Technical Education (PA-ACTE)** • <https://www.acteonline.org/pennsylvania-association-for-career-and-technical-education/>

**Pennsylvania State Education Association, Department of Career & Technical Studies (PSEA-DCTS)**  
[http://www.psea.org/general.aspx?ID=1256&coll\\_id=30](http://www.psea.org/general.aspx?ID=1256&coll_id=30)

**Career and Technical Education Resource Center at Penn State Greater Allegheny** • [www.careertechpa.org](http://www.careertechpa.org)

## National CTE Information

**U.S. Department of Education** • [cte.ed.gov](http://cte.ed.gov)

**Association of Career and Technical Education** • [www.acteonline.org](http://www.acteonline.org)

**National Association of State Directors of CTE Consortium** • [www.careertech.org](http://www.careertech.org)

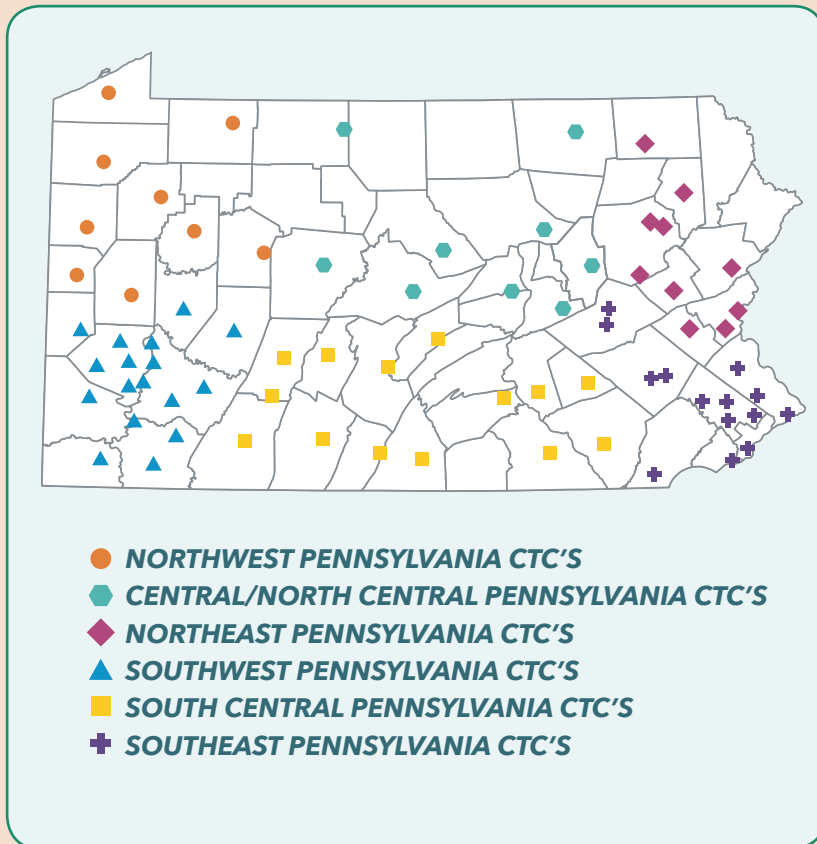
**National Research Center for Career Technical Education** • [www.nrccte.org](http://www.nrccte.org)



# Pennsylvania's Investment

## IN CAREER AND TECHNICAL EDUCATION

Through the leadership of the Governor and the General Assembly, Pennsylvania is making a strategic investment in CTE which annually helps prepare over 200,000 Pennsylvania youths and adults for the highly skilled, competitive workforce. Pennsylvania provides a critical state investment of approximately \$62 million in funding for CTE, including some funding for competitive equipment grants and adult training. Pennsylvania supports 84 CTCs, as well as 111 school districts/charter schools and 32 postsecondary institutions offering CTE. These career and technical centers, colleges, universities, and private postsecondary institutions offer over 1,700 secondary approved programs, over 1,100 postsecondary programs, and over 350 adult programs.



The Pennsylvania Department of Education does not discriminate in its educational programs, activities or employment practices based on race, color, national origin, sex, sexual orientation, disability, age, religion, ancestry, union membership, or any other legally protected category. This policy is in accordance with state law, including the Pennsylvania Human Relations Act, and with federal law, including Title VI and Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act of 1967 and the Americans with Disabilities Act of 1990.

The following persons have been designated to handle inquiries regarding the non-discrimination policies:

**FOR INQUIRIES CONCERNING  
NON-DISCRIMINATION IN EMPLOYMENT**

Pennsylvania Department of Education  
Equal Employment Opportunity Representative  
Bureau of Human Resources  
333 Market Street, 11th Floor  
Harrisburg, PA 17126-0333  
Voice Telephone (717) 787-4417  
Text Telephone: (717) 783-8445  
Fax (717) 783-9348

**FOR INQUIRIES CONCERNING NON-DISCRIMINATION  
IN ALL OTHER PENNSYLVANIA DEPARTMENT OF**

Education Programs and Activities  
Pennsylvania Department of Education  
School Services Unit Director  
333 Market Street, 5th Floor  
Harrisburg, PA 17126-0333  
Voice Telephone (717) 783-3750  
Text Telephone (717) 783-8445  
Fax (717) 783-6802