

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.

# Pennsylvania's Investment

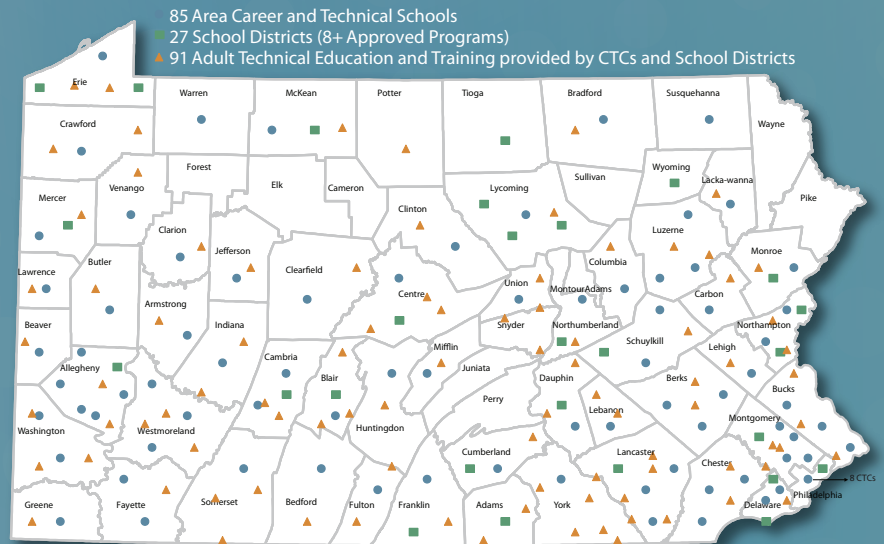


## IN CAREER AND TECHNICAL EDUCATION

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 high 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 85 CTCs, as well as 141 school districts and 44 postsecondary institutions offering CTE.<sup>1</sup> These career and technical centers, colleges, universities and private postsecondary institutions offer over 2,100 secondary approved programs, over 1,000 postsecondary programs and over 500 adult programs.

<sup>1</sup> Pennsylvania Area Career and Technical Education Schools 2009 Report



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  
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333 Market Street, 11th Floor  
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### FOR INQUIRIES CONCERNING NON-DISCRIMINATION IN ALL OTHER PENNSYLVANIA DEPARTMENT OF EDUCATION PROGRAMS AND ACTIVITIES

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## *Dear Fellow Pennsylvanian,*

In today's challenging job environment, it is more critical than ever before that our young people complete their high school education with strong academic and technical skills that prepare them for college-level studies and successful careers.

We believe this foundation will allow them to succeed personally and also make a valuable contribution to an innovative and competitive Pennsylvania economy. Building this foundation is what the new Pennsylvania Career and Technical Education (CTE) system is all about.

CTE in Pennsylvania is designed to meet a dual mission -- developing students with College Readiness skills AND a Career Path. CTE is no longer an either/or choice, but a "BOTH/AND" opportunity for student success.

At almost 80 career and technology centers (CTCs) throughout the Commonwealth, and also through hundreds of programs offered through typical high schools, career and technical education programs are built around high expectations for student learning. These expectations include the development of strong reading, writing, numeracy, problem solving, and teamwork skills, in addition to the practical and tangible career skills that motivate students and help them develop a career path for future education and work.

CTE programs motivate students of all academic achievement levels to work hard and advance their learning across academic and technical subject areas. Furthermore, CTE can help all students, including those who intend to pursue postsecondary education, develop a clear game plan for their future and understand how education can lead to a fulfilling and productive career.

Our vision for the future of Pennsylvania CTE is to develop students who are college ready, career skilled, and fueled for innovation. We hope this is your vision too, and that you will join with us in making this vision a reality for Pennsylvania students.

Sincerely,



Governor  
**Tom Corbett**



Secretary of Education  
**Ronald J. Tomalis**





# The NEW Pennsylvania CAREER AND TECHNICAL EDUCATION SYSTEM

Today's Career and Technical Education (CTE) system in Pennsylvania is focused on preparing our young people with the academic foundation, career direction, and workplace skills that will help them succeed personally, and contribute to an innovative and competitive Pennsylvania economy.

In the past, some students who were not planning to attend college were encouraged to participate in vocational education programs designed to prepare them for entering the workforce immediately after high school. But the economy for which old vocational education was built to serve no longer exists. That economy of the past offered plentiful low-skilled jobs to Pennsylvanians that allowed



them to enter the middle class and work for one employer for several decades. In contrast, the modern economy is more dynamic and fast paced, and it demands a workforce that can

constantly adapt and learn new skills. Today's workers need to have much stronger communication, critical thinking, collaboration, and creative skills than ever before.

The reinvention of Pennsylvania's CTE system is designed to meet this challenge. At the dozens of regional career and technology centers (CTC) and the high school based programs, the NEW CTE blends these college-readiness academic skills with relevant and meaningful career and workplace skills. A large percentage of students pursue college and other postsecondary education opportunities

after high school, and an increasing number of students accumulate college credits while still in high school.

The New Pennsylvania CTE system is not about placing students on a college-bound or non-college-bound track. Rather, CTE provides students with a wide range of options



and assumes that the large majority of students will need formal education and training beyond high school, even for those students who choose to immediately

enter the workforce. The NEW CTE is ultimately about maximizing student opportunities. It prepares students with the academic foundation to continue with college-level studies, and it develops their practical, marketable skills that can accelerate their postsecondary careers, and if they choose to go directly into the workforce, to enter into a skilled career instead of having to take a low-skilled, retail or menial labor job.

This booklet describes how the New CTE System in Pennsylvania works, how it is continuously reinvented, and, through real examples, how students are experiencing success and schools are making a positive impact.



## CTE Student Success Story

# tyler swasy

If you ask senior Tyler Swasy how he regards his decision to enroll in the Computer Systems Technology program at Indiana County Technology Center (ICTC), he will tell you it was “the best decision I ever made.” Yet, before attending ICTC, Tyler was under the impression that the CTC was for students who did not intend to pursue post-secondary education and that his enrollment might hurt his chances at getting into college. With encouragement and support from his parents and ICTC faculty, Tyler decided that ICTC could challenge him and prepare him for college.

**For Tyler, these experiences and having instructors who “push you along and listen to you” helped make his future even brighter.**

A successful student who earned As and Bs at his home school, Tyler continued his strong performance once he enrolled at ICTC. He joined Skills USA and placed first in the regional competition for computer maintenance and second at the state competition. Tyler also received his A+ certification and is prepared to take the Network+, Security+ and Server+ certification tests during the summer after he graduates. Tyler is a member of the National Technical Honor Society, participated in co-op and earned over \$1,000 in scholarship funds.

Tyler’s successes since enrolling at ICTC extend beyond his academic and technical achievements. According to his instructor, Tyler has “gained a lot of self-confidence” during

his time at ICTC. He also learned the value of working hard to overcome challenges. According to Tyler, he struggled in the beginning of his Network + course. Following the advice of his instructor, Tyler studied more and improved his grade from a D to an A. As Tyler states, students have “to be motivated and driven to finish” their programs at ICTC and to succeed.



Tyler attributes the learning opportunities and “amazing” faculty at ICTC with preparing him for his future education and career. He states that

ICTC provided him the chance to build upon his interests through coursework, Skills USA and co-op. For Tyler, these experiences and having instructors who “push you along and listen to you” helped make his future even brighter.

Tyler earned at least 12 dual enrollment credits while at ICTC, which he will use at Bloomsburg University to pursue a major in Computer Forensics. Tyler summed up his experiences at ICTC by stating “Look at me and what I’ve done and where I’m going.” For Tyler Swasy, his current and future success is due in large part to the preparation and opportunities afforded him at ICTC.

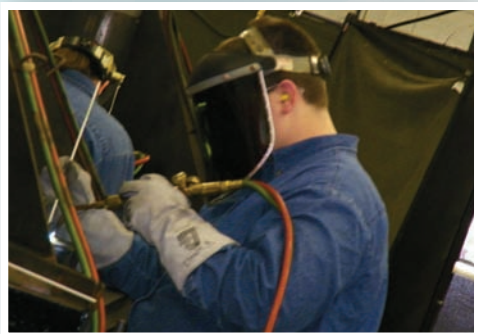


# BEST PRACTICE PROFILE: *Working to Make Sure C&C Students Take Challenging Academic Courses*



Students who pursue a career interest by attending a part-day CTC sometimes get overlooked when it comes to taking college-prep academic courses at their sending high school. Some counselors might think that students at the CTC are “non-college bound” and less interested in taking challenging academic courses. **Indiana County Technology Center (ICTC)** wanted to head off this issue by taking a proactive approach to class scheduling.

ICTC guidance staff actively work to ensure that students take rigorous and relevant classes at their sending schools. The CTC’s robust centralized records system supports their efforts and serves as



a repository for sending school and CTC course enrollment information and grades. This enables ICTC counselors to perform regular transcript

analysis and identify gaps in schedules. They then work with the sending school counselors to make necessary adjustments to students’ schedules.

The courses and grades information can be accessed by the ICTC school counselor during individual student scheduling sessions held each year in the spring. In addition to ICTC classes, the school counselor will also make suggestions for sending school courses that a student should take based on his/her career objectives, the Pennsylvania Programs of Study (POS), and related articulation agreements with post-secondary institutions.

ICTC school counselors hold three formal individual meetings with students in their senior year and two formal meetings in their junior year and sophomore year. The purpose of these meetings is

to review and discuss career and post-secondary goals, as well as general concerns. In addition to the guidance meetings, the guidance counselor also meets individually with each student following the 11th grade National Occupational Competency Testing Institute (NOCTI) pretest (taken in the spring) and the 12th grade NOCTI test to review his or her performance results.



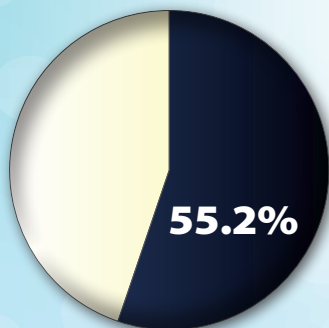
# GETTING RESULTS

## TECHNICAL SKILL AND ACADEMIC ATTAINMENT

### TECHNICAL SKILL ATTAINMENT

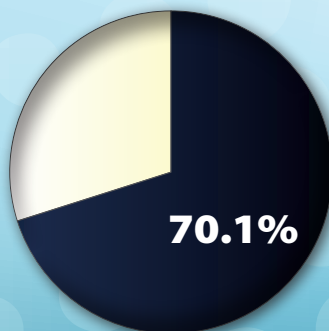
Technical skill attainment is the accountability measure under the most direct influence of a CTE program, and CTE programs are held accountable for the percentage of students that pass end-of-program assessments that are designated for each program.

In 2006, 55.2 percent of CTE students who completed a CTE program (program completers) scored competent and advanced on the Commonwealth's designated technical skills assessment test. This test, commonly referred to as the NOCTI test, is actually a series of occupationally-focused tests offered through the National Occupational Competency Testing Institute (NOCTI). For 2010, the percentage of NOCTI test takers who were competent and advanced increased to 70.1 percent. That's an increase of 14.9 percentage points or an increase of 27 percent.



**2006: 55.2%**

PERCENTAGE OF CTE COMPLETERS SCORING "COMPETENT" OR "ADVANCED" ON THE NOCTI TEST



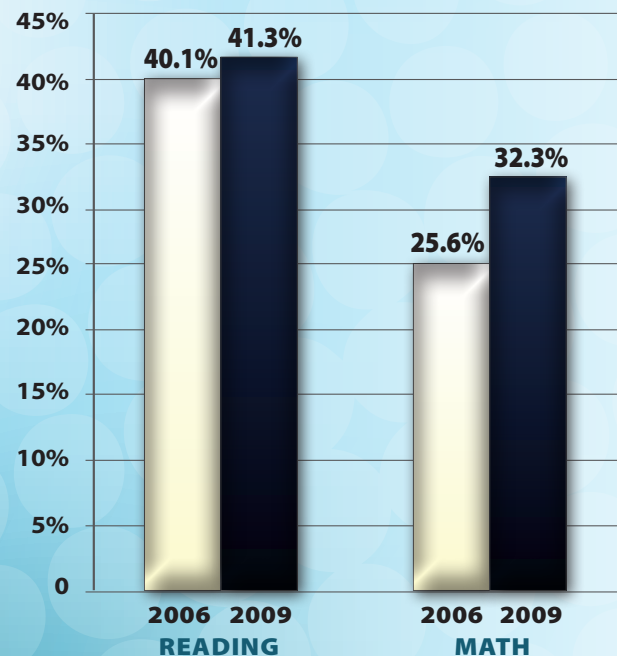
**2010: 70.1%**

### ACADEMIC SKILL ATTAINMENT

In addition to technical skills, all CTE programs, including those offered through regional CTC are accountable for the development of academic skills, as measured through the Pennsylvania System of School Assessment (PSSA) on reading and math, which is administered to 11th grade Pennsylvania students. Although most CTCs do not offer regular English/language arts or math classes in their schools (those are usually offered through the student's sending school), many CTCs have begun to integrate more reading, writing, and numeracy activities into CTE classes.

From 2006-2009, there was a 3 percent increase in CTE student reading proficiency from 40.1 percent to 41.3 percent on the 11th Grade PSSA CTE scores. Math scores for CTE students saw a substantial increase of 6.7 percent during the same period, from 25.6 percent to 32.3 percent.

### 11TH GRADE PSSA SCORES FOR CTE STUDENTS





## WHAT WORKS IN CTE: IDENTIFYING BEST PRACTICES

To help accelerate the progress of CTCs under the Technical Assistance Program (TAP), the Pennsylvania Department of Education's Bureau of Career and Technical Education (PDE-BCTE) has launched a statewide initiative to increase knowledge among CTE administrators and teachers about what practices make a



positive impact on student achievement. The result is the Pennsylvania CTE Best Practices Initiative, a project carried out by the Meeder Consulting Group in partnership with the PDE-BCTE. The CTE Best Practices Initiative has documented the strategies used by CTE programs to create Standards Aligned Systems and to support those systems with people, processes and partnerships. All of these strategies are aligned to the goal of increasing academic and technical achievement among students.



## KEY IMPROVEMENT STRATEGIES FOR PENNSYLVANIA CTE

Leaders and instructors in CTE programs that improve are intentional about achieving student success. They thoughtfully develop a Standards Aligned System, and support that system with people, processes and partnerships to deliver results. The following key improvement strategies have been observed at improvement-focused CTCs:

### CREATE A STANDARDS ALIGNED SYSTEM THROUGH INSTRUCTION, INTERVENTION, CURRICULUM, ASSESSMENT, STANDARDS AND RESOURCES

- » Integrate literacy and numeracy strategies into CTE
- » Build relevance through cross-curricular linkages
- » Provide extra help to strengthen academic and/or technical skill achievement
- » Deliver personalized student support and guidance
- » Create a standardized and aligned curriculum
- » Use assessments to target instructional strategies



### SUPPORT A STANDARDS ALIGNED SYSTEM THROUGH PEOPLE, PROCESSES AND PARTNERSHIPS

#### *People*

- » Build a culture of targeted and ongoing professional growth
- » Center teacher evaluation within a culture of professional growth
- » Develop a cohesive team

#### *Processes*

- » Be intentional and systemic about change
- » Make program and instructional decisions based on data

#### *Partnerships*

- » Cultivate relationships with community and business/industry partners
- » Strengthen relationships with education partners



# WHERE ARE THE

# JOBS?

## How to link Education and Training with Job Opportunities

Most people assume that “college” means a traditional four-year baccalaureate degree program. In this publication, we use the term “postsecondary” to indicate all forms of formalized education and training beyond high school, including certificate and degree programs offered at a technical or community college, an apprenticeship program, and a four-year baccalaureate degree program.

Most Americans are surprised to discover that a majority of American jobs are “middle skill” jobs, meaning they require more education and training than a high school diploma but do not necessarily require a four-year college degree.

*(Source: “Help Wanted” Projections of Jobs and Education Requirements Through 2018, Georgetown University Center on Education and the Workforce, 2010, Washington, DC.)*

- ✓ *By 2018, about two-thirds of all employment will require some college education or more.*
- ✓ *In fact, while an in-depth analysis of the current and future job market by the Georgetown Center says by 2018, 54 million U.S. jobs will require bachelor’s and graduate degrees, it also states that an equally large number of jobs, 49 million, will require less than a bachelor’s degree but more than a high school degree. This level of education attainment includes some college, postsecondary certificates, and associate’s degrees.*
- ✓ *On average, people with higher level degrees tend to earn more than people with lower level degrees and college experience. But beyond the general averages, the real factors in earnings are skills and the marketability of the chosen career area.*
- ✓ *It can be fairly surprising to realize that 31 percent of young workers with associate’s degrees earn more than those with a bachelor’s degree, and that 27 percent of young workers with licenses and certificates earn more than those with a bachelor’s degree.*



## PENNSYLVANIA CAREER EDUCATION AND WORK STANDARDS

The Career Education and Work Standards, Chapter 4 of Title 22, are part of the State Board of Education’s regulations of required education for all students in Pennsylvania.


The Career Education and Work Standards address four areas of knowledge:

- ✓ *Career Awareness and Preparation,*
- ✓ *Career Acquisition (Getting a Job),*
- ✓ *Career Retention and Advancement, and*
- ✓ *Entrepreneurship*

ASSOCIATE’S DEGREE	
OCCUPATION AVERAGE WAGE	
Registered Nurse	\$24.53
Computer Support Specialist	\$20.76
Respiratory Specialist	\$20.61
Medical & Clinical Laboratory Technician	\$15.13
Medical Records & Health Information Technician	\$13.76
Radiologic Technologist & Technician	\$21.08
Paralegals & Legal Assistant	\$20.80
Dental Hygienist	\$23.66
Electrical/Electronic Engineering Technician	\$23.27
Cardiovascular Technologist & Technician	\$26.78
POSTSECONDARY VOCATIONAL TRAINING	
OCCUPATION AVERAGE WAGE	
Automotive Service Technician & Mechanic	\$16.34
Licensed Practical & Licensed Vocational Nurse	\$15.04
Hairdresser, Hairstylist, & Cosmetologist	\$11.52
Real Estate Sales Agent	\$21.28
Preschool Teacher, Except Special Education	\$23,242 *
Emergency Medical Technician & Paramedic	\$12.97
Aircraft Mechanic & Service Technician	\$27.97
Fitness Trainer & Aerobics Instructor	\$18.36
Appraiser & Assessor of Real Estate	\$18.36

*\*All salaries are hourly except for Preschool Teacher in which the total is based on working less than 2,080 hours per year.*

# Linking CTE to *Pennsylvania's* **HIGH PRIORITY OCCUPATIONS**

 To compete regionally, nationally and globally, Pennsylvania needs skilled workers to work in high priority, high impact industries. That's why the Commonwealth's Departments of Labor and Industry, Community and Economic Development, and Education have come together to prioritize nine groups of industries that provide the Commonwealth a competitive advantage and potential for long-term economic growth.

Even during a severe economic downturn, some skilled jobs go unfilled because there is not a sufficient supply of skilled workers, while in other industries and occupations there may be more skilled workers than there are available jobs. This ebb and flow and evolution of the job market demands that all students gain broad skills sets as well as the capacity to learn and adapt to changing technologies and job responsibilities.

**... Pennsylvania needs skilled workers to work in high priority, high impact industries.**

As technologies advance and industries evolve, CTE evolves as well. While this is an ongoing challenge, keeping a tight alignment among CTE and current industry needs and skills is in the best interest of students and Pennsylvania's competitive economy.

The following list identifies the nine high priority industries and provides a sampling of occupations within each industry. Over time, the only CTE programs to receive state and federal funds will be those that offer a program designated as a high priority industry on a statewide or regional basis.



# Pennsylvania's

## TARGETED INDUSTRY CLUSTERS

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 MATERIALS AND DIVERSIFIED MANUFACTURING

#### Sample High Priority Occupations

- » Welders
- » Chemical Equipment Operators
- » Industrial Truck and Tractor Operators
- » Metal and Plastic Molding and Casting Machine Operators

### AGRICULTURE AND FOOD PRODUCTION

#### Sample High Priority Occupations

- » Veterinarian
- » Consumer Information Specialists
- » Veterinary Technologists and Technicians
- » Environmental Scientists and Specialists

### BUILDING AND CONSTRUCTION

#### Sample High Priority Occupations

- » Plumbers, Pipefitters and Steamfitters
- » Heating, Air Conditioning, and Refrigeration
- » Construction Managers
- » Brickmasons and Blockmasons

### BUSINESS AND FINANCIAL SERVICES

#### Sample High Priority Occupations

- » Sales Managers
- » Management Analysts
- » Securities, Commodities, and Financial Services Sales Agents

### EDUCATION

#### Sample High Priority Occupations

- » Elementary and Secondary School Administrators
- » Engineering Teachers
- » Career and Technical Education Teachers
- » Educational, Career and Technical, and School Counselors

### INFORMATION AND COMMUNICATION SERVICES

#### Sample High Priority Occupations

- » Computer Software Engineers, Systems Software
- » Computer Systems Analysts
- » Architectural and Civil Drafters
- » Network and Computer Systems Administrators

### LIFE SCIENCES

#### Sample High Priority Occupations

- » Pharmacists
- » Medical and Clinical Laboratory Technicians
- » Biochemists and Biophysicists
- » Registered Nurses

### LOGISTICS AND TRANSPORTATION

#### Sample High Priority Occupations

- » Supervisors- Transportation and Vehicle Operators
- » Automotive Technicians
- » Heavy and Tractor Trailer Truck Drivers
- » Customer Service Representatives

### LUMBER, WOOD, AND PAPER

#### Sample High Priority Occupations

- » Cabinetmakers and Bench Carpenters
- » Woodworking Machine Operators
- » Paper Goods Machine Operators
- » Furniture Finishers

# BEST PRACTICE PROFILE: *Teaching Smarter by Integrating Literacy and Numeracy into C&E Courses*



At the **Reading Muhlenberg Career and Technology Center (RMCTC)** director Gerald Witmer and his leadership team pushed faculty to move beyond a traditional approach to teaching and to look at “How do we teach smarter?” For RMCTC faculty, teaching smarter meant making the integration of enhanced literacy and numeracy strategies a cornerstone of instruction.

To help instructors meet these expectations, the leadership team makes available several professional development opportunities that focus specifically on literacy and numeracy training and on preparing instructors to conduct turn-around training for their colleagues.

The leadership team also hired math and literacy instructional coaches to help instructors learn

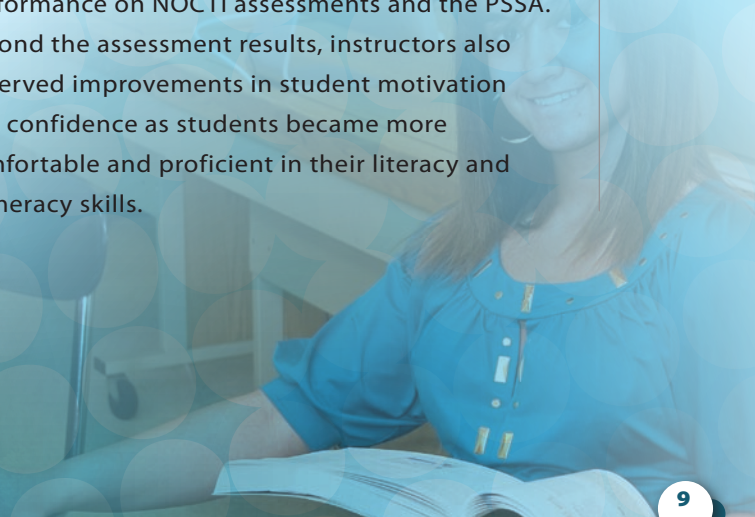
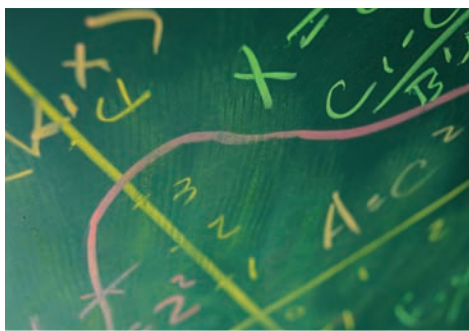
how to integrate literacy and numeracy strategies. The coaches help instructors to identify relevant academic standards to incorporate in

a lesson, resources that support their lesson and strategies to teach these standards. They also model integrated lessons for instructors.

As instructors became more proficient with integration, the initiative to “teach smarter” became more sustainable. Instructors use daily writing prompts, assign research papers and teach note-taking skills and comprehension strategies to improve their students’ literacy skills. In addition, they teach math skills in a way that explicitly connects technical learning to these relevant skills, helping students to see the real-world connections in their classroom learning.

RMCTC staff cite the integration of literacy and numeracy as a key strategy to help students develop both academic and technical skills.

One welding instructor observed that as he began to integrate literacy and numeracy strategies, his students became more proficient in learning their technical skills. When students participated in applied work in the lab (or in CTE parlance, the “shop”), they had fewer questions. Many instructors credit integrated instruction with increasing student performance on NOCTI assessments and the PSSA. Beyond the assessment results, instructors also observed improvements in student motivation and confidence as students became more comfortable and proficient in their literacy and numeracy skills.



# BEST PRACTICE PROFILE: *Engaging Projects in Partnership with Local Businesses*



Instructors at **Lenape Technical School** in Ford City, Pennsylvania identified and created an opportunity for cross-program collaboration involving multiple CTE programs (often referred to as “shops”) as well as a local business in a real-world application. In the fall of 2009, the owner of KPM Herkules Group (KPM), a local company specializing in the manufacture of roll machining equipment, proposed a project for students to manufacture a small-scale, fully functional grinder for use by his company as a prototype.

The CADD/Pre-engineering instructor coordinated with fellow CTE instructors to meet with the KPM team to define the scope, phases and timeline of the project. The group submitted a formal request form to the school’s administration and was granted permission to work on this outside

KPM supplied the CADD/Pre-engineering students with hand-drawn engineering drawings they had produced in 1993. The CADD/Pre-engineering students will recreate all of the manufacturer’s drawing using either Inventor, Solid Works or AutoCAD (three prominent technical drawing software programs). KPM will provide the mechatronics students with the program and control unit for the grinder. In addition, KPM will supply all necessary materials and mentors to work with the students throughout the project.

The CADD/Pre-engineering instructor and mechatronics instructor serve as the advisors for this project.

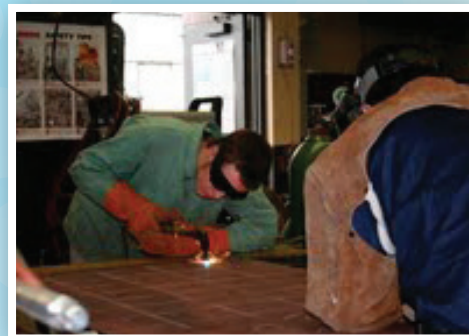
Students from each CTE program serve as project managers. They are responsible for knowing the status of the project in their area, keeping their team on track and determining if they are in need of additional supplies. CADD/Pre-engineering students will be responsible for monitoring the progress in each shop and making sure everyone has the materials they need.

In addition, KPM has agreed to assist with fabricating any part that the CTC is not equipped to fabricate. KPM will have the students come to its location and work with a mentor to make the part at the KPM facility.

project.

This project incorporates the work of students from at least six CTE programs: CADD/pre-engineering, mechatronics,

precision machining, welding, collision repair and carpentry.



## CTE Student Success Story

# Katelyn Eckert

Before attending Lancaster County Career and Technology Center (LCCTC), Katelyn Eckert struggled in high school, both in her academic work and her behavior. In her words, she “didn’t care about grades.” She earned Cs and Ds in her courses and “slacked off.” She also tended to clash with authority figures. Fortunately for Katelyn, her time and experiences at LCCTC helped transform her into an “A” student who thrived under the direction and support of her instructor and who is on her way to fulfilling her plans for post-secondary education and a successful career.

Katelyn’s turn-around journey began as a junior when she enrolled in LCCTC’s half-day healthcare cluster program. Already interested in becoming a pediatrician but lacking

**Katelyn found the learning experiences at LCCTC furthered her interest and determination to pursue a career in healthcare.**

the drive and focus to pursue her goals, Katelyn found the learning experiences at LCCTC furthered her interest and determination to pursue a career in healthcare. To continue her learning, she decided to enroll in the full-day medical assistance program for her senior year. The coursework and expectations at LCCTC proved much tougher than Katelyn had anticipated. Yet, she attributes

the helpfulness of her instructors and the satisfaction from learning about and working in the “real world” for motivating her to “stick with it and not give up.” Katelyn participated in an internship in a medical office during which she helped greet patients for their appointments and progressed to taking their vitals before they met with the doctor.

During her time at LCCTC, Katelyn found success and the motivation to pursue her goals. She made the honor



roll and became a member of the National Technical Honor Society. She also earned her Certified Medical Assistance certification. After

graduation, Katelyn plans on attending Mansfield University where she will major in nursing. After college, she plans on attending medical school to fulfill her dream of becoming a pediatrician. As her instructor noted, Katelyn performed a “total 180” from her first days at LCCTC to when she graduated. She is leaving LCCTC with greater maturity, determination and a sense of responsibility in addition to the valuable technical skills she learned.



## BEST PRACTICE PROFILE:

# *Developing Workplace Skills*



Leaders at the **Erie County Technical School (ECTS)** know that students need more than general academic skills and specific occupational skills to be successful in college and the workplace.



To truly be ready, students need the professional skills and knowledge to work effectively in a modern workplace setting. To address this need,

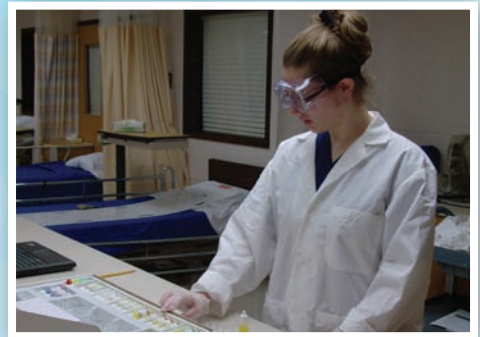
during the 1998-1999 school year, ECTS established a "Professional Skills Program" to ensure that ECTS graduates have the employability skills necessary for the workplace.

All students participate in this stand-alone program which includes three courses: "Leadership Principles," "Business Principles" and "Total Quality Principles." First-year students (typically sophomores) take the "Leadership Principles" course. In this course, students work on the habits that enable individuals to take greater personal responsibility for all aspects of their lives. Interpersonal skills and attitudes are supported by materials such as the FISH! Philosophy and the 7 Habits of Highly Effective Teens by Sean Covey.

The second course, "Business Principles," is taken by second-year students. The objective of this course is to build awareness of business principles such as marketing, inventory control, profit and loss, as well as personnel management and economics.

An emphasis is placed on entrepreneurship in this course. Students develop a business concept and create a simple business plan and logo, which they present to the class. They also participate in mock interviews and learn about marketing and human resources concepts.

Third-year students enroll in "Total Quality Principles," which provides them with a background in the concepts and implementation of total quality management. While participating in this course, students develop individual and group projects that allow them the opportunity to practice such total quality tools as the Delphi technique, histograms and gap analysis.



The Professional Skills Program at ECTS was selected as the 2000 Pennsylvania Association for Career and Technical Education (ACTE) Exemplary Program of the Year and consistently receives praise from students and business advisory members.



# BEST PRACTICE PROFILE:

## *Building Employability*



### **Indiana County Technology Center**

**(ICTC)** in Indiana, Pennsylvania provides

CTE instruction to approximately 380 secondary students in grades 10 through 12 who attend ICTC for half-day sessions, either in the morning or afternoon. ICTC serves students from seven school districts and currently offers 14 secondary-level CTE programs.



Every student at ICTC participates in a stand-alone “Employability Skills Workshop” in the fall of their senior year. Developed in the 1990s, the course

consists of four two-hour classroom sessions, and focuses on career exploration, the employment process and general employability skills.

Students participate in career exploration activities and learn how to review job descriptions to determine a fit with their skills and career goals. They discuss the local and national job markets, as well as salary ranges, cost of living indexes, and other data that will help them make an informed career decision.

Students also learn about the tools they will need for a successful job search, including the development of a resume, cover letter and follow-

up letter and how to complete a job application.

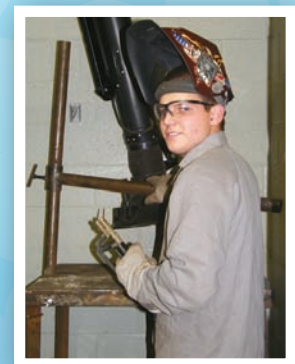
Students are required to develop a personal job search network, which consists of at least 10 people

who could help them in their career. They also participate in mock interviews, which are conducted by a member of the local business community.

Graded activities within the workshop become part of the students’ program grade.

The course also touches on some basic aspects of entrepreneurship, including the basics of a business plan and factors that contribute to a successful business.

Students are required to save their work electronically and on paper. ICTC stores the electronic files and keeps them active for two years after graduation so that students may access them if needed for post-secondary or employment purposes.





# Creating PROGRAMS OF STUDY

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



One of the most important elements of redesigning CTE in Pennsylvania is creating a clear linkage between CTE and academic courses, and between high school and

postsecondary education. These important connections are meant to ensure that high school graduates are truly college-ready, that high school content and curriculum is seamlessly connected to related content at the postsecondary levels, and that students can easily apply, enroll and make a smooth transition into a related postsecondary education and training. Programs of Study are the new organizational tool to help achieve these important objectives.

Through its SOAR Initiative (Students Occupationally and Academically Ready), Pennsylvania CTE is re-organizing its offering around Programs of Study which are clearly delineated sequences of academic and CTE courses centered on specific career objectives. Unlike traditional CTE courses, the Programs of Study link high school and postsecondary programs, and include not only the CTE program but also the academic coursework.

SOAR is built on programs of study which incorporate secondary education and postsecondary education elements and include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content. These career and technical Programs of Study include a statewide articulation agreement between secondary schools and postsecondary institutions.

### ***Each secondary Program of Study must:***

- » Align to High Priority Occupations as identified by PA Department of Labor and Industry;
- » Incorporate skills that are identified through national research and analysis tools;
- » Include recognized industry-based skill credentials or skill certifications where possible;
- » Obtain verification by secondary instructors, postsecondary faculty, business and industry representatives; and
- » Link to core academic content, including: Science, Literacy, Math, and Career Education and Work.

# 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
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## Middle School Cluster: Production Occupations

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

## High School Pathway: Advanced Materials & Diversified Manufacturing

9	English I	Geometry	Earth and 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

## OCCUPATIONS REQUIRING LESS THAN A BACCALAUREATE DEGREE



- Industrial Machinery Mechanics
- Machinists
- Cutting Machine Operator
- Structural Metal Fabricators
- Multiple Machine Tool Operator
- CNC Machine Operator
- Lathe Machine Tool Operator
- Machinery Maintenance Worker
- Numerical Too Programmer Industrial Engineer Technician
- Commercial & Industrial Electrical Equipment Repairer

## OCCUPATIONS REQUIRING BACCALAUREATE DEGREE



- Industrial Engineer
- Industrial Production Manager
- Mechanical Engineer
- Purchasing Agent
- Sales Engineer

## BEST PRACTICE PROFILE:

# *Building State of the Art Curriculum*



The leadership team at the **Lehigh Career and Technical Institute (LCTI/Lehigh)** knew that to build program quality, it needed a standardized curriculum development, delivery and evaluation process for all of its CTE programs.

The LCTI team created a curriculum process that addresses how to create a curriculum that aligns academic and technical standards, integrates literacy and numeracy skills and can be organized around a series of learning tasks. The curriculum must be aligned to college-readiness academic skills and professional-level certifications. As the Director of Curriculum and Instruction stated, "Curriculum is the heart of any school. The better your curriculum ... the better your school."

*Key steps in the curriculum process include identifying or creating the following:*

- » A course description;
- » The career objectives that students can pursue;
- » A "task list" of the specific knowledge and skills that a student will develop;
- » A "task grid" to help students see the tasks that they will be learning;
- » The related academic content that is aligned with the program;
- » Specific "learning guides" that help organize the curriculum in day-by-day learning activities;
- » A task tracking system to record student progress, and
- » A performance assessment log for students to use to keep track of their task development.

Administrators and instructors identify many positive outcomes of the curriculum process. Instructors become more familiar with the courses they teach and better understand the long-term goals of their programs. The learning guides and performance assessment logs create opportunities for instructors to differentiate the pacing of instruction to meet the individual needs of students. Finally, the process explicitly addresses the integration of academic and CTE content so that instructors know how to blend the content areas throughout the curriculum.



Career and Technical Education (CTE) in Pennsylvania is designed to develop students who are college ready, career skilled, and fueled for innovation. We look forward to continuing to work closely with students, their families, and our business and education partners to build positive outcomes for each student involved in CTE and to contribute to the overall prosperity of Pennsylvania. Don't hesitate to contact us at the Pennsylvania Department of Education or any of the regional Career Technology Centers (CTCs) to find out more about Pennsylvania CTE and to get involved.



Best wishes,

*Lee Burket*

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The Pennsylvania Department of Education, Bureau of Career and Technical Education (PDE-BCTE) launched a statewide initiative to increase the quality and impact of CTE programs. To support progress toward improvement, PDE provides assistance to CTCs through the Technical Assistance Program (TAP). CTCs participating in TAP are working to raise student performance on the Pennsylvania System of School Assessment (PSSA) and occupational end-of-program assessments. To supplement the work of TAP, the Pennsylvania CTE Best Practices Initiative was created to increase knowledge among CTE administrators and teachers about what practices make a positive impact on student achievement. The CTE Best Practices Initiative is carried out by the Meeder Consulting Group in partnership with the BCTE.

To find out more about these efforts, visit:

**Technical Assistance Program:**

[http://www.portal.state.pa.us/portal/server.pt/community/technical\\_assistance\\_program\\_%28tap%29/19234](http://www.portal.state.pa.us/portal/server.pt/community/technical_assistance_program_%28tap%29/19234)

**Best Practices Initiative:**

[http://www.portal.state.pa.us/portal/server.pt/community/best\\_practices/7683](http://www.portal.state.pa.us/portal/server.pt/community/best_practices/7683)

## KEY PENNSYLVANIA CTE CONTACTS

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

**Pennsylvania Association for Career and Technical Education (PA-ACTE)** • [www.pa-acte.org](http://www.pa-acte.org)

**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)