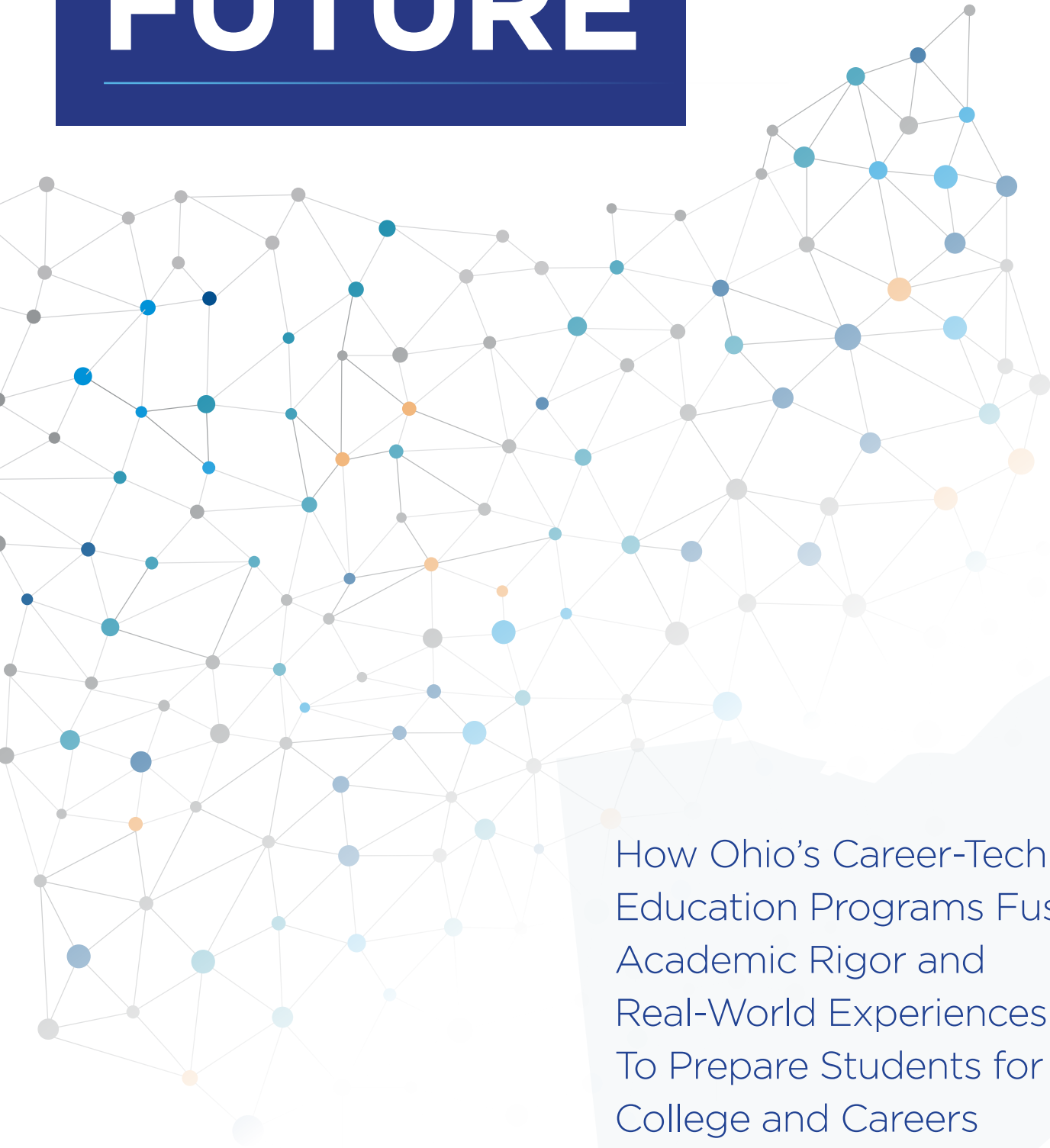# Seizing the
FUTURE

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How Ohio's Career-Technical
Education Programs Fuse
Academic Rigor and
Real-World Experiences
To Prepare Students for
College and Careers

Introduction

It is noon on a Tuesday in February, and 12th grade students wade through 15 inches of freshly fallen snow in Lake County, Ohio, to get to **Auburn Career Center** for the second half of their day. They spent the morning at their traditional high schools focused on senior-level academic courses but will spend the afternoon applying their content skills in a project-based, hands-on classroom, shop, or laboratory. The school is literally abuzz: In the Electrical Engineering Prep program students learn the fundamentals of AC and DC electrical systems used for power and control in industrial, commercial, and residential applications. With a slight smell of ozone in the air, the teacher demonstrates how to take 120 volts of AC and convert it to 5 volts of DC — a practical application not only for mechanical engineers and electrical technicians but also for those who create power sources for an iPhone or a Samsung Galaxy.

Approximately 245 miles southwest sits **Centerville High School**, just on the outskirts of Dayton, where students scramble down the hallway to get to their Business Academy program. They prepare for the opening of the school's credit union, a recognized branch of the Day Air Credit Union, where students serve as tellers, provide full banking services to their clientele (Centerville High School students and teachers), coordinate the branch's marketing initiatives and offer detailed accounting services. Business Academy students execute the full operation, putting their mathematics, business, accounting, and marketing skills to work each day.

Elsewhere, just a few miles east of Cleveland, construction trade students at **Excel Technical Education Career Consortium (TECC)** coordinate closely with CADD engineering technology and environmental education students to design, build, and outfit three model homes — one log, one A-frame, and one conventional — to be unveiled during a community open house this spring. CADD engineering technology students spend the first half of their school year designing and drafting blueprints that construction trade students use to construct the actual homes. Environmental education students plan, design, and execute connected landscaping themes for each of the homes. Members of the community and business leaders always attend the culminating spring open house, giving students a chance to showcase their work.

These schools are just three of the 91 career-technical planning districts that dot the landscape of the Buckeye State. They blend challenging academic concepts into real-world experiences and go the distance to ensure that all students meet — or in most cases exceed — the state's graduation requirements and are ready for success in college or the workplace. The schools maintain a prominent position in Ohio's broader education portfolio in large part because of their unique laboratory, internship, mentorship, and college-credit opportunities.

The Changing Face of Career-Technical Education in Ohio

Over the last two decades, career-technical education (CTE) in Ohio has received a statewide facelift. Years ago, traditional "vocational education" targeted specific students — typically those with poor grades and behavior problems. The schools offered limited programs; put students on separate, narrowly focused tracks; provided only high school-level credit; and trained graduates for a specific occupational skill set.

Today's CTE story is vastly different. More than 10 years ago the state's CTE leaders pledged to require all students to complete a rigorous set of coursework to graduate, and now the schools target everyone. The programs integrate academics in a rigorous and relevant curriculum and focus on high-skill, high-demand career clusters and career pathways. CTE programs also partner with postsecondary institutions, offering students opportunities for dual enrollment so they can graduate with college credits, a few steps closer to associate, bachelor's, and advanced degrees or even employment. Similarly, they foster relationships with local businesses to ensure that curriculum and instruction are relevant and offer students real-world learning experiences through co-ops and internships.

"Career-tech now integrates rigorous academic preparation with career education," says Steve Gratz, senior executive director at the Ohio Department of Education (ODE). "We are 'mashing up' college and career. This is a shift from the past and one that we are serious about."

Recently enacted policies make this seriousness clear. In 2014, CTE received a shot in the arm from the state's mid-biennial review legislation, which overhauled the state's graduation requirements, beginning with the class of 2018. To graduate, all students, including those enrolled in CTE, must complete Ohio's Course Requirements, which embed Ohio's New Learning Standards.[1] Students now must also take seven end-of-course exams and meet one of the following criteria:[2]

- Earn a cumulative passing score on those end-of-course exams;
- Earn a "remediation free" score on a nationally recognized college admission exam; or
- Earn a state-approved industry-recognized credential or a state license for practice in a vocation and achieve a score that demonstrates workforce readiness and employability on a job skills assessment.

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[1] Ohio's Course Requirements, formerly known as the Ohio Core, include four units of English and mathematics, including Algebra II; three units of a lab-based science and social studies; a half unit each of health and physical education; and three units of electives.

[2] Beginning in the 2014–15 school year, Ohio's end-of-course exams include Algebra I and Geometry or Integrated Math I and II, physical science, American history or American government, and English I and II.

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These new graduation requirements adhere to consistent calls from Ohio's CTE leaders that high expectations be maintained for all students. In 2006, when the legislature was considering enabling legislation for Ohio's Course Requirements, there was a vigorous debate about whether or not career-technical planning districts would be held to the same expectation as traditional high schools. CTE leaders stood united then — as they do today — for maintaining rigorous course expectations, making it clear that their students would not be the exception and that the completion of Algebra II or its equivalent was a reasonable expectation for graduation.[3]

Nathan Bishko, director of Excel TECC, is passionate about what his programs can do for students. He knows that the state's CTE programs are still weighed down by outdated and inaccurate reputations and wants parents to know that "career-tech" has changed. A lot.

He makes this difference clear when he talks to prospective students: "Do you want to receive true hands-on learning for two years within a particular academic area that will immediately prepare you for college or a career of your choice? Do you like to meet students from other schools and spend half your day on a college campus?"

Bishko is just as direct when he talks to parents: "Do you want your sons or daughters to earn college credit while in high school, have workplace internships, be immediately employable upon graduation, and be college ready? Do you want your sons or daughters to receive authentic experiences that are only reserved for college students and professionals?"

Bishko and his peers at Auburn Career Center and Centerville High School are just a few of the educators changing the face of CTE in Ohio. Across the state there are passionate teachers at each of the nearly 300 locations where CTE is offered who are just as mission driven and are tirelessly working to ensure that students and parents fully understand the benefits of attending a CTE school. And clearly, their hard work is paying off: In 2014, more than 97 percent of the graduates from Auburn, Centerville, and Excel went on to postsecondary education or advanced training, employment, apprenticeships, or the military upon graduation.

[3] Ohio law does allow for a student who enters 9th grade on or after July 1, 2010, and before July 1, 2016, to "opt out" of Ohio's Course Requirements, provided the student meets certain conditions (Ohio Revised Code 3313.603).

STUDENT SPOTLIGHT • AUBURN CAREER CENTER

Ryan Watson, a senior in Auburn's Internet Programming and Development program, has had the opportunity to take classes both at the Career Center and online. This year, he has dedicated much of his time working in the computer lab to applying the concepts and skills he learned as a junior. Ryan and his fellow students developed an appointment system application for the Career Center's Cosmetology program, and he is developing a content management system as his capstone project. Ryan will attend Duquesne University next fall and major in digital media with an arts concentration. The school awarded him a $14,000 scholarship and will honor the 10 college credits he earned through Auburn's Internet Programming and Development program.

Shelby McBride, a senior allied health technology student, has advanced from learning medical technology from textbooks to creating a clay model of the human body's joints and muscles. She just completed a course in medical mathematics where she directly applied Algebra II skills to calculate medication dosages. Before the school year ends, Shelby is working with the Auburn's internship coordinator to secure an internship with the local hospice center. Outside of class, she is involved in Drug Free Clubs of America, Ambassador and STARS and serves as vice president of SkillsUSA. Shelby has six college credits under her belt, which she plans to cash in at Kent State University, where she will major in nursing.

Moriah Thompson, a senior in Auburn's Emergency Medical Service program, spends much of her time in labs performing CPR, clearing blocked airways, splinting and stabilizing broken bones, and transporting patients. If she receives an 80 percent or higher on the program's end-of-year exam, she will advance to a national written and physical test. If she passes that, she will receive an emergency medical technician basic license. Moriah plans to use that license to become an emergency room nurse. After graduating high school, she plans to complete her prerequisite courses at Lakeland Community College and then enroll in the nursing program at Kent State University.

Connor Paparone, a senior architecture project management student, and his class are currently working in coordination with Western Reserve Community Development and Auburn Career Center to design a "Western Reserve House," which will be built by Auburn Career Center's Construction Technology program students. The design process includes everything from drafting blueprints using AutoCAD to making sure the house meets building code requirements. Previously, Connor worked on projects to design a coffee shop for students with disabilities and a new football stadium for Cardinal High School. Last month, Connor and his class took ninth place in a home and garden show competition. Outside of school, Connor spent three months interning at Turner Construction and has been guaranteed a full-time position when he graduates from college. Connor will have earned eight college credits by the end of his senior year and plans to pursue an engineering degree at the University of Akron.
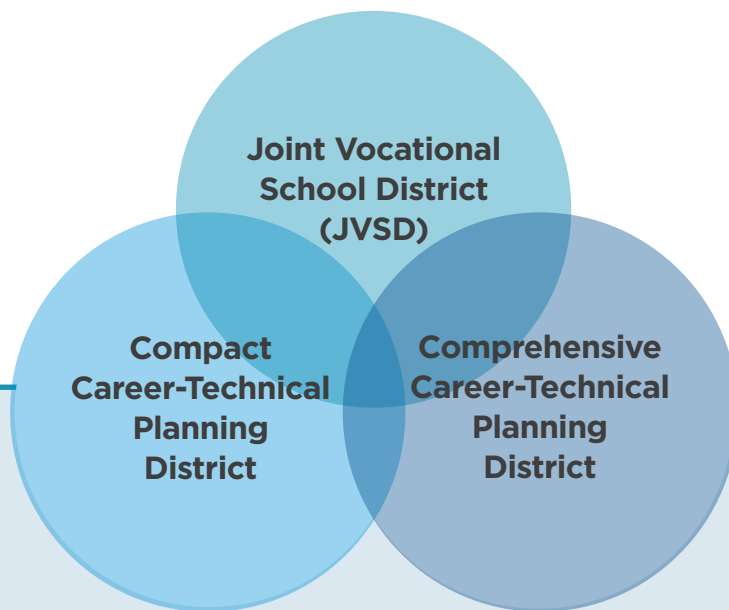
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Integrating Rigorous Coursework into Real-World Experiences

Gavin Gower and Cody Thompson, both seniors at Auburn Career Center, have been writing programs and drafting blueprints to design and create intricate chess pieces from a computer numerical control milling machine, using complex trigonometry concepts to get the configurations right. "It's all about finding the x and y coordinates on rounded parts," says Gavin, as Cody nods in agreement.

That is just one example of the ways rigorous coursework is integrated into real-world experiences. There are plenty of others, such as when the advanced manufacturing class designed and produced a set of titanium parts used by Ricky Carmichael, one of motocross's living legends. Or when the Architecture Project Management class used AutoCAD to draft blueprints for the "Western Reserve House," which was built by Auburn Career Center's Construction Technology program students.

These real-world experiences help students grasp and apply the challenging concepts contained in Ohio's Course Requirements, which most students begin taking as 9th graders. Most students start their CTE programs as 11th graders — though they have an option to begin a career path as early as 7th grade. Eleventh and 12th graders continue rigorous coursework at their home school or, in some cases, at their CTE school for a half day. The other half of the day is spent engaged in their specified CTE program of study. Almost all programs and courses for 11th and 12th graders apply the rigorous coursework in a laboratory or shop setting.

Joint Vocational
School District
(JVSD)

Compact
Career-Technical
Planning
District

Comprehensive
Career-Technical
Planning
District

TODAY'S CAREER-TECHNICAL EDUCATION STRUCTURE IN OHIO: A THREE-PRONGED STRUCTURE

Ohio has a long history of providing students with career-technical education (CTE) opportunities, and the presence of high school industrial arts classes can be traced back to 1894. In the mid-1950s, the concept of a trade school emerged, designed to serve a broad geographical area and focused on industry, agriculture, business, and marketing. In the 1960s, with an increase in youth unemployment and increased state and federal funding, Ohio experienced dramatic growth in "vocational education," with joint vocational schools surfacing in the state's eight major urban centers. In January 1970, the State Board of Education adopted vocational education standards that required all of Ohio's school districts to provide vocational education opportunities to students in grades 9–12 within four years. During this time, three CTE models emerged organically: joint vocational schools, district compacts, and comprehensive models. Each model respects local control, a closely held tenet of education delivery in Ohio.

Today, Ohio has 91 designated career-technical planning districts peppered across the state. Career-technical planning districts still fall into three categories:

Joint Vocational School District (JVSD) — Auburn Career Center is a JVSD, which is a "joint district" that serves an area of two or more adjacent school districts in one or more counties and is governed by a joint vocational school board consisting of representatives from the member districts.

Compact Career-Technical Planning District — Excel Technical Education Career Consortium (TECC) operates a compact, whereby a group of school districts enter into an operating agreement to share in the provision of CTE. Generally, member districts share control of the compact. One district serves as the lead district and fiscal agent (Mayfield City Schools serves in this role for Excel TECC).

Comprehensive Career-Technical Planning District — Centerville High School stands as a comprehensive high school, which is organized as a comprehensive compact model. Centerville High School also serves students from Kettering and Oakwood City School Districts.

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Killing Two Birds with One Stone: Earning High School and College Credit

Matt Stuve is a senior engineering student at Centerville High School and already has 24 college credits under his belt, thanks to a Tech Prep scholarship arrangement his school has with neighboring Sinclair Community College. Several of his college-level engineering courses are taught by Sinclair professors. He balances his college credit-bearing engineering coursework with his senior-year academic schedule, which includes Advanced Placement (AP) Language and Composition, Calculus, Government, and AP Physics II. In addition to his Tech Prep scholarship, he has the potential to earn even more college credit through his AP coursework, depending on how he performs on the AP exams. "The 'senior slide' doesn't apply to me," says Stuve. "It's been a challenging year, but I know it will pay off."

Stuve's situation is not unique among CTE students in Ohio. Most earn college credit while still in high school through dual enrollment, articulated credits, and AP courses. Centerville High School students, for instance, can earn college credits in almost every one of the school's 18 CTE programs. Engineering students might earn a total of 25 semester credit hours — or the equivalent of one year of college. Environmental science students could earn a total of eight semester credit hours. And students in the school's Business Academy program could earn a total of 18 semester credit hours, depending on the courses they take. These credits translate into real dollar savings for Centerville's families. On average, one credit hour equates to $99. Last year, students at Centerville High School alone earned more than 1,700 semester college credit hours, saving Centerville families nearly $170,000.

> *Tech Prep* creates curriculum and programs that are seamless and non-duplicative, enabling students to matriculate early from high school to college. In 2013, Ohio required all career-technical education programs focused on workforce development to be Tech Prep and offer college-credit-bearing opportunities. The state has already invested nearly $10 million toward that end.

The same situation exists at Auburn and Excel. Excel, for instance, notes that the 368 students who comprised its graduating class of 2014 earned 993 Tech Prep college credits. More notably, that same class also racked up more than $9.5 million in scholarship awards, reflecting the high-level caliber of students in the school. "Years ago, college credit and dual certifications didn't exist as a part of vocational education," says Auburn's guidance counselor Judy Falcone. "Today, it's what sets us apart and gives students a leg up on college."

Indeed, CTE has distinguished itself in Ohio by combining college and career and offering students multiple ways to earn college credit while receiving career training. Tech Prep creates curriculum and programs that are seamless and non-duplicative, enabling students to matriculate early from high school to college. Tech Prep was an original component of the federal Carl D. Perkins Career and Technical Education Improvement Act, but program funding was gutted by the federal

government in 2011. "Even though the federal government defunded Tech Prep, Ohio went all in on the program," says Emily Passias, assistant director of accountability at ODE. "The program was too good to give up." In 2013, Ohio required all CTE programs focused on workforce development to be Tech Prep and offer college-credit-bearing opportunities. Since 2011, the state invested $10 million toward that end.

To help students earn and transfer college credit, ODE is working closely with CTE schools to convert program offerings to courses. Prior to the conversion, a student entering an Architecture Project Management program would complete a block program schedule and learn specific skills including AutoCad 2014, blueprint designs, two-dimensional and three-dimensional drawing, residential property design, construction process, etc. Those specific skills would not have been reflected on the student's transcript because they were bundled into the program. Today, those skills are captured through courses that appear on the student's high school transcript, enabling them to earn more college credits through the state's articulated credit program. The program is akin to the AP program — students complete specific courses, fulfill assignments, and earn certifications.

"Rigor matters when the stakes are high and students have the opportunity to earn both high school and college-level credit at the same time," says Chuck Cowgill, guidance counselor at Centerville High School. "Courses must have consistently high standards regardless of where the credit is earned, or the model will be questioned."

STUDENT SPOTLIGHT • CENTERVILLE HIGH SCHOOL

Cainan Moore, a senior in the Business Academy program, has benefitted from the school's dual enrollment partnership with Sinclair Community College. Over his junior and senior years, he has earned 14 college credits. He is also taking two Advanced Placement (AP) courses, including macro-economics and micro-economics. He is a member of the National Honor Society, Octagon Club and Key Club. Outside of school, he owns his own lawn care company, which has 35 customers per week, earns more than $21,000 in annual revenue, and employs five students. Cainan is president of the school's branch of the Day Air Credit Union, a unique partnership that enables Business Academy students to run all components of the credit union branch operation, including marketing, banking, clerking, and accounting. The branch is open for business in the school building and serves students and teachers as its primary clients. After graduating high school, Cainan plans to attend Miami University, University of Illinois, or University of North Carolina, where he will major in finance and/or computer science.

Matt Stuve, a senior engineering student, has spent a good deal of time this year designing and building an Extreme Bot — a motorized robot that can weigh 15 pounds or less with a spinning mass that acts as a weapon against the robot it is competing against. Made from scratch in the school's engineering lab, the Extreme Bot did well at the regional competition and is headed to state. When he is not in his engineering class, Matt is enrolled in Advanced Placement Language and Composition, Calculus, Government, and the Physics II. He has been accepted to mechanical engineering programs at both The Ohio State University and The University of Cincinnati.

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Partnering with Business To Ensure Relevance and Quality

Ohio's economy has shifted notably over the last 10 years. Since 2008, the state lost more than 120,000 jobs, with manufacturing jobs leading the decline. While the state's economy is currently rebounding, these challenging economic times forced education leaders to rethink their approach to ensure that students would be properly trained and placed in the emerging high-tech, high-skilled jobs of the future.

It was during this period that ODE forged close connections with the Governor's Office of Workforce Development and with Governor Kasich's jobs initiative, JobsOhio, both of which carefully coordinate with leaders in the state's business community. These partnerships resulted in the development of Ohiomeansjobs.com, which includes a K–12 portal for students and parents to explore the skills necessary for in-demand jobs, take a career interest survey, learn about apprenticeships, develop resumes and cover letters, and identify possible career pathways.

ODE has leveraged these business partnerships to identify a list of industry-recognized credentials that drive programming across the state's CTE schools. To ensure relevance and quality, ODE employs a two-step process for recognizing and honoring industry-recognized credentials. The first step uses statewide, in-demand occupations to surface a list of industry-recognized credentials. The second step engages community stakeholders, including parents, schools and businesses, to identify community-specific industry-recognized credentials that might not have originally surfaced as an in-demand occupation. Students who achieve these certifications can earn college credit through the state's articulated credit program. "The list of approved industry-recognized credentials is updated regularly to ensure quality,

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Ensuring Accountability: Career-Technical Planning District Report Cards

In 2012, the Ohio Department of Education started issuing school report cards for each of the 91 career-technical planning districts. The career-technical education report cards measure:

- Technical skill achievement based on assessments that measure the skills and knowledge students learn in a career-technical program;

- Graduation rates based on the proportion of career-technical education concentrators who graduate from high school within four and five years;

- How well students are prepared for success based on students who earn dual enrollment credit, AP credit, and an honors diploma; and

- Post-program outcomes based on the proportion of students who are employed, are in an apprenticeship, join the military, or are enrolled in postsecondary education or advanced training within six months of graduating. The category also includes the proportion of students earning industry credentials or certificates before they leave high school or in the first six months after leaving high school.

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especially since attainment of the credential can lead to graduation," says Passias. "We want students who receive targeted training to have job opportunities upon graduation. The goal is to give students real-world experience that results in a job."

Ohio reports these industry credential data on its career-technical planning district report cards. As part of its Prepared for Success category, the state publicly notes results for dual enrollment credits, AP preparation, and honors diploma candidates. Additionally, the report cards measure Post-Program Outcomes, which consider the proportion of students who are employed, are in an apprenticeship, join the military, or are enrolled in postsecondary education or advanced training within six months of graduation. The category also includes the proportion of students earning industry credentials or certificates before they leave high school or in the first six months after graduation. Ohio signaled that it was serious about preparing students for both college and career when it embedded these measures into its statewide accountability system.

ODE also maintains and updates Ohio's Technical Content Standards. Revisited every three years by panels of industry leaders and educators, these standards embed Ohio's New Learning Standards and help ensure that students have the technical skill and training necessary to earn an industry-recognized credential or a state license for practice in a vocation and achieve a score that demonstrates workforce readiness and employability on a job skills assessment — one pathway to high school graduation in Ohio. "Through our courses we are maxing out Ohio's New Learning Standards," says Adam Priefer, Business Academy teacher at Centerville High School. "Students emerge from programs ready to earn recognized program certifications and articulated college credit."
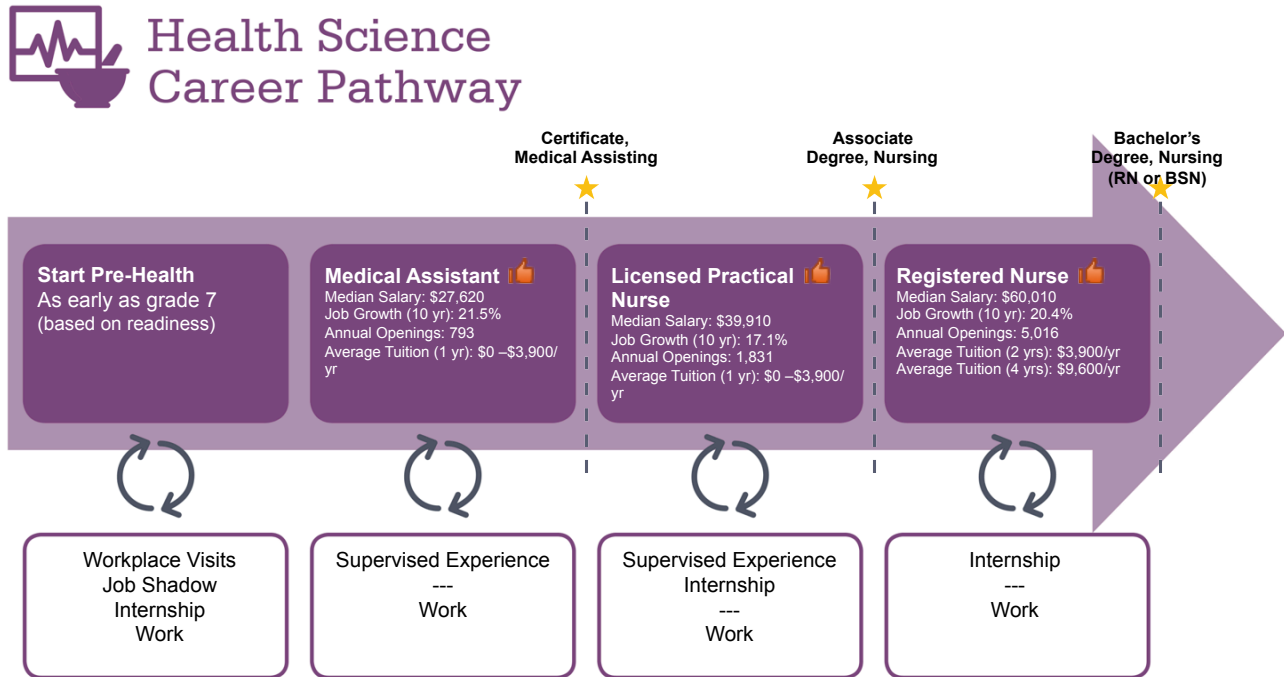
Finally, through a close partnership with the business community, ODE has identified about 50 integrated career pathways that outline the types of jobs available in 16 career clusters, along with the secondary and postsecondary courses a student needs to start down a specific career path (See figures 1&2). The career pathways cover nearly 100 jobs, and development of additional pathways is determined by Ohio's in-demand jobs report.

"Ohio has designed its career pathways to be true pathways that span all levels of education," says ODE's Steve Gratz. "It's a clear way to illustrate possibilities to students and parents."

At the local level, CTE schools have taken business partnerships even further to provide career counseling, ensure the relevance and rigor of program curriculum, and offer students real-world experiences. Auburn partners with more than 80 northeastern Ohio businesses; many of those leaders serve on the school's advisory board; work directly with teachers; and host internships, apprenticeships, and other on-the-job experiences for students. Auburn benefits from a ready-made, local business partnership known as the **Alliance for Working Together Foundation.** The Alliance was created in 2002 to help ensure a highly qualified, highly skilled workforce for the region. To that end, the Alliance provides training, educational outreach, strategic partnerships, and grants to local schools. Through the partnership, Auburn's advanced manufacturing students receive Occupational Health and Safety Administration Career Safe certification, credentials from the National Institute of Metalworking Skills, and eight college credits to Lakeland Community College. Currently, 80 of Auburn's 260 12th grade students are engaged in internships with a local business.

Figure 1: Health Science Career Pathway

Health Science Career Pathway

| | Certificate, Medical Assisting | Associate Degree, Nursing | Bachelor's Degree, Nursing (RN or BSN) |

Start Pre-Health
As early as grade 7
(based on readiness)

Medical Assistant 👍
Median Salary: $27,620
Job Growth (10 yr): 21.5%
Annual Openings: 793
Average Tuition (1 yr): $0 –$3,900/yr

Licensed Practical Nurse 👍
Median Salary: $39,910
Job Growth (10 yr): 17.1%
Annual Openings: 1,831
Average Tuition (1 yr): $0 –$3,900/yr

Registered Nurse 👍
Median Salary: $60,010
Job Growth (10 yr): 20.4%
Annual Openings: 5,016
Average Tuition (2 yrs): $3,900/yr
Average Tuition (4 yrs): $9,600/yr

| Workplace Visits Job Shadow Internship Work | Supervised Experience --- Work | Supervised Experience Internship --- Work | Internship --- Work |

Provided by middle schools, high schools, employers, Ohio Tech Centers, and colleges.

Preparing students for multiple options after high school:
gainful employment and/or postsecondary study.

👍 *Ohio In-demand Occupations*

Data reflects 2014 Ohio labor statistics and public institutions of higher education for 2013-2014. For specific tuition costs, visit ohiohighered.org.

Ohio | Department of Education   Ohio MEANS Jobs.   Ohio | Board of Regents University System of Ohio

Figure 1 shows the Health Science Career Pathway, one of the state's most in-demand pathways based on job projections. It specifies the jobs within the particular pathway, job salaries, expected future job growth, and certifications and degrees necessary to be qualified for the job.

Figure 2: Necessary Courses for a Health Science Career Pathway

Health Science Career Pathway

Secondary Pathway: **Allied Health and Nursing**   Postsecondary Program: **Nursing**

An Example of Courses with Secondary and Postsecondary Credits

Secondary	7 8	English I	Algebra I	Physical Science	Social Studies	Fine Arts	Health Science & Technology		
	9 10	English II	Geometry	Biology	World History	Health (.5) PE (.5)	Principles of Allied Health	Nutrition and Wellness	World Languages
	11	English III	Algebra II	Chemistry	U.S. History	Mental Health	Medical Terminology	World Languages	
	12	English IV	Trigonometry/ Calculus	Anatomy & Physiology	U.S. Government	Clinical Laboratory Techniques	Patient Centered Care		
Postsecondary	Year 1 1st Semester	English	College Algebra	College Seminar	Nursing Foundations	Human Growth & Development	Human Anatomy	Patient Care	
	Year 1 2nd Semester	Statistics	Health Maintenance & Restoration I	Pharmacology	Human Physiology	Family & Community Health	Human Patho-physiology	Biochemistry	
	Year 2 1st Semester	Interpersonal Communication	Microbiology	Health Maintenance & Restoration II	Psychiatric & Mental Health Nursing	Psychology			
	Year 2 2nd Semester	Nursing, Leadership, & Management	Humanities Elective	Technical Elective					

High School Career-Technical Education Program Courses
High School Courses for Postsecondary Credit (Including Apprenticeship Hours) and the Corresponding Postsecondary Courses
Required Courses
Recommended Electives

Visit education.ohio.gov/CareerConnections for reference information.   10/2014
Course titles and sequences will vary between schools.

Ohio | Department of Education   Ohio MEANS Jobs   Ohio | Board of Regents University System of Ohio

Figure 2 specifies the necessary courses for the career pathway. Using health science as an example, a 7th or 8th grade student interested in a health science career might begin taking a prehealth course. As a 9th or 10th grader, that student would need to complete English II, Geometry, Biology, World History, Health and Physical Education, and World Languages and enroll in the career-technical education courses of Principles of Allied Health and Nutrition and Wellness. That student would be earning college credit in 12th grade, according to the career pathway trajectory.

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Guaranteeing a Job after College

School-business partnerships are as beneficial to the businesses as they are to the students. Connor Paparone, a senior in Auburn's Architecture Project Management program, stands as a direct beneficiary of the school's partnership with **Turner Construction**, a North American-based, international construction services company. Just three months into his engineering internship, he is coordinating with architects to launch a major construction project for the Cleveland Clinic. And he has already secured what he really wants: a job. Turner Construction has already offered Paparone a full-time position upon earning a baccalaureate degree in engineering. Fully intending to seize his future, Paparone plans to attend the University of Akron next fall, where he will major in engineering.

"This is the real deal," says Auburn Superintendent Margaret Lynch. "Students impress business partners and cash in on jobs four years later. This says a lot about our students, our partners, and our teachers."

STUDENT SPOTLIGHT • EXCEL TECC:

Richard Kristosik, a senior enrolled in the Information Technology and Programming (ITP) program, has been working on two real-world projects. He and his fellow classmates are developing an application for Euclid Creek, a division of Cleveland Metro Parks. Park visitors can download the app on their smartphones to identify plants and their uses. Richard is also part of a team competing in a website contest for TMW Systems, a transportation company. In addition to the ITP classes, Richard is enrolled in Government, Precalculus, British Literature, and Physics and is on the football and track teams at Mayfield High School. By the time he graduates, Richard will have earned between 13 and 15 college credits, which he plans to transfer to a computer engineering program at Cleveland State, John Carroll, Mount Union, or Case Western University.

Delaney Canfield, a digital arts and technology senior, spends two days per week in classes and the rest of the week interning at Cleveland Metropolitan School District's (CMSD) television studio. Delaney has benefitted from the personalized nature of the Digital Arts and Technology program and was able to select an internship that provides her with experience in her greatest area of interest: photography. At CMSD, she helps design and film the district's short video segments for its YouTube channel. She will continue her work at CMSD though the summer and potentially through her college career. Delaney received an academic scholarship to attend Cleveland State University and plans to major in film with a minor in business.

Cydnee Martin, a senior in the CADD Engineering Technology program, uses AutoCAD and Revit software to design blueprints for three houses: an A-frame, a log cabin, and a one-story conventional. In addition to designing the homes, Cydnee helps oversee the Construction Technology program students' work to construct the houses. The design process is year-long, starting with drafting blueprints in September and culminating in an open house showcasing the completed homes in May. Cydnee will earn a total of 13 college credits through the program's partnership with Lakeland Community College. In addition to her CADD Engineering Technology program, Cydnee is currently enrolled in Government, Honors British Literature, and Precalculus. Cydnee earned a full soccer scholarship to Jackson State University, where she would like to explore aerospace engineering.

John Sternen, a senior in the Medical Technologies two-year program, spends one period per day applying the skills he learned as a junior, including infection control and dentistry. He has also had the opportunity to experience on-the-job learning through a variety of internships. John most recently worked with paramedics at the Mayfield Fire Department and prior to that served as an intern at the Cleveland Clinic, a role for which he earned the clinic's Best Ambassador Award. Outside of the Medical Technologies program, John is enrolled in Physics, British Literature, and Advanced Biology. He has earned eight college credits and was offered an $18,000 per year scholarship to Xavier University, where he plans to pursue a premedical degree in natural sciences.

A CLOSE LOOK AT AUBURN CAREER CENTER SCHOOL: BY THE NUMBERS

AUBURN CAREER CENTER

Organizational setup: Joint vocational school district, serves 11 school districts.

Student outcomes: In 2014, 97 percent of Auburn Career Center students were employed, in the military, in an apprenticeship, or enrolled in two and four-year postsecondary education or advanced training. Ninety-one percent of students in the class of 2012 graduated from high school.

Programs: Its 22 programs include Advanced Manufacturing, Allied Health Technology, Architecture Project Management, Automotive and Collision Repair, Automotive Technology, Business Management Technology, Computer Networking Technology, Construction Technology, Cosmetology, Culinary Arts, Electrical Engineering Prep, Emergency Medical Service, HVAC, Industrial Maintenance Services, Information Support and Services, Interactive Multimedia Technology, Internet Programming and Development, Landscape Horticulture, Patient Care Technician, Sports Medicine, Teaching Professions Pathway, and Welding.

Total college credits and scholarship awards earned:
- Through college tech-prep agreements, students can earn from three to 18 credits in their career-technical program.
- 177 students in the graduating class of 2014 earned 826 credits, translating to $90,844 saved in tuition.

Quotes from business:
"Fredon Corporation is a member of the National Tooling and Machining Association and once a year we gather with companies from all over the United States. I can tell you Ohio is one of the fortunate states where schools have programs that prepare the next-generation workforce to match the needs of industry. We're very thankful to Auburn for recognizing industry needs."

 Richard Ditto, *Vice President of Operations, Fredon Corporation, Mentor, OH*

"Our relationship with Auburn's Landscape Horticulture program has been very rewarding. We have had two successful interns this year, which is significant for an industry that does not usually attract many young people. Both students will be full-time employees when they have finished their degrees."

 Kathie Freshour, *Secretary and Treasurer, North Coast Perennials, Inc., Madison, OH*

For additional detail on school outcomes see Table 1.

A CLOSE LOOK AT CENTERVILLE HIGH SCHOOL: BY THE NUMBERS

Organizational setup: Comprehensive high school that is organized as a comprehensive compact career-technical planning district, serving students in Centerville, Kettering, and Oakwood City School Districts.

Student outcomes: In 2014, 98 percent of Centerville career-technical education students were employed, in the military, in an apprenticeship, or enrolled in two and four-year postsecondary education or advanced training. One hundred percent of students in the class of 2012 were dually enrolled while in high school. One hundred percent of students in the class of 2012 graduated from high school.

Programs: Its 18 programs include Accounting, Allied Health, Automotive Technology, Biotechnology, Business Academy, Communication Arts, Construction Trade, Culinary Arts, Digital Design, Early Childhood Education, Engineering, Environmental Science, Exercise Science, Information Technology, Interactive Media, Marketing Education, Mass Communication, and Technical Theater.

Total college credits and scholarship awards earned:
- Through college tech-prep agreements, students can earn from three to 24 credits in their career-technical program. The graduating class of 2014 earned 1,730 credits, translating to $171,270 saved in tuition.
- 27 percent of students were enrolled in AP courses.

Quotes from business:

"As we prepare our future engineers, we need to use practical applications and emphasize manufacturing. Centerville High School's Engineering program does a great job of blending the two and helping Centerville students be prepared for college and the workplace."

Rick Mount, *President and Owner, RAM Precision Industries, Centerville, OH*

For additional detail on school outcomes see Table 1.

A CLOSE LOOK AT EXCEL TECC SCHOOLS: BY THE NUMBERS

EXCEL TECHNICAL EDUCATION CAREER CONSORTIUM (TECC)

Organizational setup: Compact career-technical planning district, serves 10 school districts.

Student outcomes: In 2014, 98 percent of Excel TECC students were employed, in the military, in an apprenticeship, or enrolled in two and four-year postsecondary education or advanced training. Ninety-eight percent of students in the class of 2012 graduated from high school.

Programs: Through its 21 programs, Excel TECC targets 23 of the top 30 fastest growing occupations in northeastern Ohio, including the medical, construction and marketing fields. Programs include Auto Mechanics, Business Academy, CADD Engineering Technology, Construction Trade, Cosmetology, Culinary Arts, Digital Arts and Technology, Early Childhood Education, Environmental Education (includes three subdivisions), Fire/Emergency Medical Service Training, Information Technology and Programming, Interactive Media, Job Training, Marketing, Medical Technologies, Performing Arts Academy, Studio Art and Design, and Career-Based Interventions.

Total college credits and scholarship awards earned:

* Through college tech-prep agreements, students can earn from three to 28 credits in their career-technical program. The graduating class of 2014 earned 993 credits, translating to $114,068 in tuition savings.

* 368 students in the 2014 class earned more than $9.5 million in scholarship awards.

Program demand: Demand exceeds program capacity in all but one of Excel TECC's 21 programs (studio art and design).

Quotes from business:

"Over the years, my involvement with Excel TECC has grown from participating in mock interviews to getting more directly involved with students. Our three part-time interns are gaining real-world experience in our shop that enhances the CADD program curriculum. Several graduates have continued to work with us even as they've moved on to four-year college degree programs."

Andy McCartney, *President, Bowden Manufacturing, Cleveland, OH*

"I've regularly employed one or two students from Excel TECC each year. I enjoy observing the personal growth of the students employed in my practice. Many pursue higher education to eventually step into careers related to health care. My patients and my team always recognize and appreciate the students' enthusiasm and interest in health care."

Charles Berner, *DDS, President, Charles E. Berner, DDS, Inc., Cleveland, OH*

For additional detail on school outcomes see Table 1.

Achieve

Empowering and Mobilizing Top-Flight Teachers

In many cases, motivated and innovative teachers serve as the linchpin to thriving business partnerships. Those who are empowered and deployed by school leaders to cultivate business partners in their field and invite businesses into their labs or shops witness a transformation in their own teaching practice and in the student learning experience.

Centerville Business Academy teacher Adam Priefer is no exception. He brokered the unique partnership with Day Air Credit Union as part of his effort to find a project-based, real-world experience to transform the school's Business Academy program. Today, the students operate a fully functional branch office in the school. "We wanted an applied experience for the students," he says. "Now they engage in something that extends beyond the classroom and the school building."

Teachers are also using tools to unlock student innovation — particularly when it comes to applying the engineering design process — and taking learning to a whole new level. Rodney Kozar, Auburn's interactive multimedia technology teacher, is overseeing the installation of a new Massachusetts Institute of Technology Fab Lab. Initially launched as an outreach project from MIT's Center for Bits and Atoms, the MIT Fab Lab is now enhancing classrooms and labs across the nation. Once fully installed, students will be able to create any project design using a three-dimensional printer, test it, and build it in one laboratory experience. "When you think about it, Auburn Career Center is already one big Fab Lab with all of its connected programs," says Kozar. "This just shrinks everything down into one room to magnify the learning experience."

All of this work is done by some of the top-flight teachers who abound in Ohio's CTE schools. Thomas Fulton, Excel's Performing Arts Academy instructor, is just one example. Fulton's resume is studded with theater and acting experience from the Center of Repertory Theatre to the Phoenix Theatre Ensemble and the Cleveland Theatre company. Fulton has a commanding presence on stage and in the classroom, and his students are drawn to him. "We don't teach William Shakespeare. We act it," says Fulton. "Shakespeare's plays were not written to be read aloud in a classroom. They were written to be performed on stage. And when students perform it, they get it." Fulton's alumni go far and wide after graduating from the program, including The Juilliard School in Manhattan, Emerson College in Boston, and New York University in New York City.

Looking to the Future

In his annual State of the State Address on February 24, 2015, Governor Kasich declared: "Parents, career-technical education is good for students!"

Ohio's governor continues to bet on CTE. In FY 2014–15, the governor provided additional funding for the state's career-technical planning districts to emphasize those career fields in highest demand. In his proposed 2015–16 budget, Governor Kasich recommended a 50 percent increase in funding (from $6.2 million in 2015 to $9.4 million in 2016) for CTE enhancements, including programs and services to help Ohio's students develop career plans, identify initial educational and career goals, and develop the skills necessary to make informed career and education choices throughout life. The additional funding is targeted to improve the effectiveness of career counseling for students.

As these additional investments are ushered in, it is also clear that Ohio will not soon turn away from the high expectations that drive its CTE programming. From fusing academic rigor with real experiences to ensuring that students meet or exceed the state's graduation requirements, Ohio CTE schools are driving innovation across the state, transforming teaching and learning practices, and catching the attention of state-level elected officials and policy leaders.

But perhaps most important, the system is catching the attention of parents and students eager to benefit from the innovative programs that promise a great education, career and technical skills, and the possibility of college credits or even a job. "My future is set," says Connor Paparone. "Not only am I taking eight college credits with me to the University of Akron, but I'm guaranteed a full-time job once I have my bachelor's degree. This is the beauty of CTE."

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TABLE 1: *School Outcomes*

Graduation Rates	CTPD Name	2012 4-Year Graduation Rate %	2013 4-Year Graduation Rate %
	Auburn JVSD CTPD	93.6	91.0
	Centerville City CTPD	98.3	100.0
	Mayfield Excel TECC CTPD	91.6	97.6

Note: 4-year cohort graduation rates not calculated prior to FY12. FY14 rate not yet finalized.

Post-Program Outcomes	CTPD Name	2013 Placement Rate %	2014 Placement Rate %
	Auburn JVSD CTPD	94.0	97.4
	Centerville City CTPD	94.7	97.6
	Mayfield Excel TECC CTPD	97.1	98.4

Note: Includes placement into postsecondary education or advanced training, employment, apprenticeships, or the military. Students may be included in more than one category.

Postsecondary/ Advanced Training Rate	CTPD Name	2013 Postsecondary/ Advanced Training Rate %	2014 Postsecondary/ Advanced Training Rate %
	Auburn JVSD CTPD	87.0	49.3
	Centerville City CTPD	76.4	88.2
	Mayfield Excel TECC CTPD	42.1	83.8

Note: 4-year cohort graduation rates not calculated prior to 2012. 2014 rate not yet finalized.

Note: Districts are accountable for overall placement only; Placement categories are not reported publicly.

Source: Ohio Department of Education, 2014

Note: Data from 2012 represents the class of 2011; 2013 represents the class of 2012; 2014 represents class of 2013.

About Achieve

Achieve is an independent, nonpartisan, nonprofit education reform organization dedicated to working with states to raise academic standards and graduation requirements, improve assessments, and strengthen accountability. Created in 1996 by a bipartisan group of governors and business leaders, Achieve is leading the effort to make college and career readiness a priority across the country so that students graduating from high school are academically prepared for postsecondary success. When states want to collaborate on education policy or practice, they come to Achieve. At the direction of 48 states, and partnering with the National Governors Association and the Council of Chief State School Officers, Achieve helped develop the Common Core State Standards. Twenty-six states and the National Research Council asked Achieve to manage the process to write the Next Generation Science Standards. Achieve has also served as the project manager for states in the Partnership for Assessment of Readiness for College and Careers, which are developing next generation assessments. And since 2005, Achieve has worked with state teams, governors, state education officials, postsecondary leaders and business executives to improve postsecondary preparation by aligning key policies with the demands of the real world so that all students graduate from high school with the knowledge and skills they need to fully reach their promise in college, careers and life. For more information about the work of Achieve, visit www.achieve.org.

Acknowledgements