

STEM Learning and Research (STELAR) Center @
Education Development Center

STELAR Webinar:
Career Technical Education
(CTE)

Wednesday, January 25, 2017



Who We Are

- Innovative Technology Experiences for Students and Teachers (ITEST) Program
- STEM Learning & Research Center (STELAR)
- Education Development Center
- Supporting the ITEST program and its grantees since 2003
- Available to assist those considering submitting an ITEST proposal

What We Do

- Facilitate projects' success through **technical support** with a focus on synthesis of findings
- Inform and influence the field of STEM stakeholders by **disseminating** project findings nationally
- Deepen the impact and reach of the ITEST program by **broadening participation** in the ITEST portfolio



Some of Our Activities

- **Webinars:** Effective Dissemination, Designing Research for ITEST Projects, Mentoring Models
- **Monthly Newsletter:** Information to stay updated on all things STEM and ITEST
- **Project Specialists:** A STELAR staffer who works directly with each project to provide resources and make connections
- **Regional and Thematic Meetings:** A way for current projects to network with each other
- **Management Information System (MIS):** Annual collection of project information about what projects do, who they work with, what they have achieved

Find Resources on STELAR Website



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FEATURED POST

ITEST PROJECTS ADDRESS NSF PRIORITIES ON YOUTH PARTICIPATION, TEACHER PD & BROADENING PARTICIPATION

Read about the new ITEST syntheses!

[Learn More »](#)



Helping prepare a diverse, skilled, and innovative STEM workforce.

TEXT SEARCH



[ADVANCED SEARCH](#)



How STELAR Can Help You



ITEST Program Findings



ITEST Proposal Development



STELAR Materials



Join Our Mailing List

Get Ideas for Designing ITEST Proposals

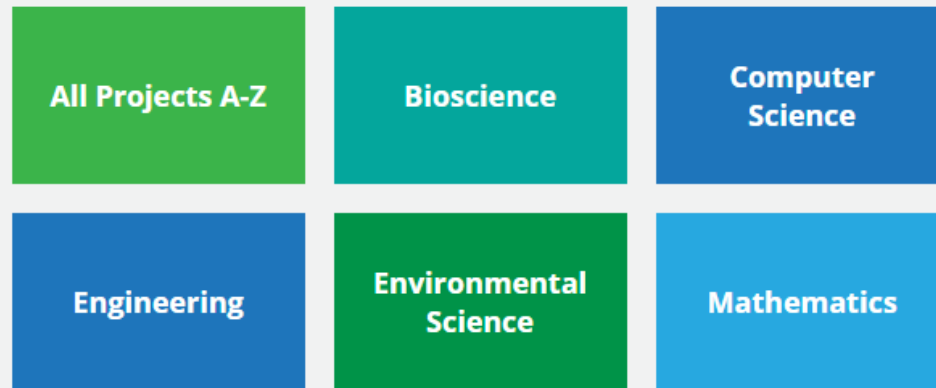
ITEST Proposal Development: <http://stelar.edc.org/proposal-development>

- + GET TO KNOW ITEST
- + PREPARE YOUR PROPOSAL FOR SUBMISSION
- + DEVELOP A ROBUST RESEARCH DESIGN
- + CREATE AN EFFECTIVE EVALUATION STRATEGY
- + CONNECT WITH PARTNERS
- + REACH UNDERSERVED POPULATIONS
- + DEVELOP THE WORKFORCE OF THE FUTURE

Explore Project Profiles

1 - 8 of 312

[Download Results](#)



Opportunities to Learn: Creative Science Through Inquiry, a Middle Grades Teaming Framework

2016 - 2019

This project will develop opportunities for students to learn creatively in science through inquiry. The project will prepare 72 middle school teachers to work with approximately 1800 students from economically disadvantaged schools who have had...

SEARCH FOR PROJECTS

Multiple criteria within a field is an OR condition. Multiple fields are AND conditions.

- + DISCIPLINE(S)
- + PROJECT PARTICIPANT(S)
- + PROJECT GRADE SPAN(S)
- + PROJECT SETTING(S)
- + STATES WHERE WORK OCCURS
- + PROJECT STATUS

Apply Filters

Resource Library – Publications, Curricular Materials & Instruments

1 - 8 of 629

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Events

News

Instruments

Publications

Opportunities

Curricular Materials

STELAR ITEST PI & Evaluator Summit 2017 - Save the Date

Thursday, June 15, 2017 - 8:00am to Friday, June 16, 2017 - 5:00pm

Event at Westin Arlington Gateway

Save the date for the 2017 STELAR ITEST PI & Evaluator Summit! The summit is an opportunity for ITEST Principal Investigators (PIs) and evaluators to come together and share successes, challenges, and lessons learned from the ITEST...

[READ MORE »](#)

SEARCH FOR RESOURCES

Multiple criteria within a field is an OR condition. Multiple fields are AND conditions.



RESOURCE TYPE



DISCIPLINE(S)



TOPIC(S)

Apply Filters

Clear Filters

Connect with others via the People Connector

<http://stelar.edc.org/opportunities/people-connector-directory>

People Connector Form


People Connector Directory

STELAR People Connector Directory - Add your Information

The purpose of this directory is to connect individuals looking for partners or tools for their ITEST proposals with those who can provide partnership or tools (e.g., a school district looking for a research methodologist, a community-based organization looking for an external evaluator).

Please complete this form if you are looking for or can provide specific expertise for ITEST proposals. The information you provide will be publicly available and accessible via the STELAR website.

* Required



STEM Learning and Research Center

First name *

Last name *

Email *

Organization / Institution *

City *

State *

Website

Listing Type *

Select one listing type for this submission. If you are both LOOKING FOR and PROVIDING expertise, please complete this form for one, and then submit an additional form for the second.

I am LOOKING FOR expertise

I can PROVIDE expertise

STELAR People Connector Directory

File Edit View Insert Format Data Tools Form Add-ons Help All changes saved in Drive

Comments Share

fx

The purpose of the People Connector Directory is to connect individuals looking for partners or tools for their ITEST proposals with those who can provide partnership or tools (e.g., a school district looking for a research methodologist, a community-based organization looking for an external evaluator). The information provided is publicly available and accessible via the STELAR website. You can get notified of additions to the Directory by clicking on 'Tools' and 'Notification Opportunities' above (you must sign in to a google account in order to access the Tools).

Note: STELAR and NSF do not endorse the credibility or expertise of any specific individuals on the compiled list.

Timestamp	First name	Last name	Email	Organization / Institution	City	State	Website	Listing Type	Type of Expertise	Expertise Details	
14	9/8/2014 16:42:48	Anita	Krishnamurthi	akrishnamurthi@afterschool	Afterschool Allian	Washington	DC	http://www.afterschool	I can PROVIDE expertise	Researcher, Informal ed	Please reach out if you're looking f
15	9/9/2014 9:07:53	Bonnie	Swan	bonnie.swan@ucf.edu	University of Cent	Orlando	Florida	http://education.u	I can PROVIDE expertise	Evaluator, Researcher	Program Evaluation and Education
16	9/9/2014 9:19:45	Cynthia	Tanaris	tanaris@pitt.edu	University of Pitts	Pittsburgh	PA	http://www.ceac.p	I can PROVIDE expertise	Evaluator, Researcher, E	Cynthia A. Tanaris, Ed.D., founde
17	9/9/2014 12:09:42	Amy	Grack Nelson	agnelson@smm.org	Science Museum	St Paul	MN		I can PROVIDE expertise	Evaluator, Evaluation ins	Expertise in the development and v
18	9/9/2014 17:00:08	Troy	Sadler	sadlet@missouri.edu	University of Miss	Columbia	MO	http://education.m	I can PROVIDE expertise	Evaluator	The ReSTEM Institute: Reimagin
19	9/10/2014 18:56:16	Vega	Vanessa	vanessa@rockman.com	Rockman et al.	San Francisco	CA	www.rockman.com	I can PROVIDE expertise	Evaluator, Researcher, F	Can provide expertise on: evaluatio
20	9/16/2014 10:00:21	Kevin	Glass	glass@educationconnect	Center for Resear	Litchfield	CT	www.educationcon	I can PROVIDE expertise	Evaluator	We can provide both internal and e
21	9/16/2014 13:14:04	Juan	Concepcion	rubricsolution@gmail.com	Concepcion-Card	Manati	Puert	www.rubric-solutio	I am LOOKING FOR expertise	Evaluator, Informal educ	Proven educational STEM practice
22	9/17/2014 15:21:28	Kristin	Bass	kristin@rockman.com	Rockman et al	San Francisco	CA	www.rockman.com	I can PROVIDE expertise	Evaluator, Evaluation ins	Rockman et al is an independent r
23	9/17/2014 10:39:14	Karen	Yanowitz	kyanowitz@astate.edu	Arkansas State U	Jonesboro	AR		I can PROVIDE expertise	Evaluator, Researcher	I have two ITEST grants and am ve
24	9/18/2014 16:41:00	Jared	Ozga	jozga@wcs.org	Wildlife Conservat	New York	NY	wcs.org	I am LOOKING FOR expertise	Informal education site,	Looking to forge partnerships with
25	9/22/2014 15:26:32	Robinson	Robinson	ronrobinson@lewislatimer	Lewis H. Latimer	Chelsea	Mass	www.lewislatimer	I can PROVIDE expertise	Informal education site	I can provide information on how to
26	10/22/2014 16:12:12	Teresa	Reagan	treagan@ncat.edu	NC A&T State Uni	Greensboro	NC		I am LOOKING FOR expertise	Evaluator	We are searching for an external e
27	11/12/2014 21:47:15	Aaron	Parker	Aaron.T.Parker@gmail.c	University of Guan	ASAN	Guam		I am LOOKING FOR expertise	Evaluator, Formal educa	Looking for help putting together a
28	2/17/2015 12:30:42	Jana	Craig-Hare	janach@ku.edu	University of Kans	Lawrence	KS	www.alt.ec.org	I can PROVIDE expertise	Evaluator, Researcher, Evaluation instrument	
29	2/17/2015 16:23:36	Jaclyn	Ocuppaugh	jo2424@tc.columbia.edu	Teachers College,	New York	New York		I can PROVIDE expertise	Evaluator, Researcher, Evaluation instrument	

Stay in Touch!

Contact us: stelar@edc.org

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Twitter: https://twitter.com/STELAR_CTR

LinkedIn: <https://www.linkedin.com/groups/STELAR-Center>

Find resources: <http://stelar.edc.org/>

Today's webinar:

The Center to

ADVANCE  CTE



Kimberly A. Green
Executive Director, Advance CTE



Kate Blossveren Kreamer
Deputy Executive Director, Advance CTE



Career Technical Education: Major Trends and Connections to STEM

*Kimberly Green and Kate Blosveren
Kreamer*

January 25, 2017

About Advance CTE

- *(Formerly The National Association of State Directors of Career Technical Education Consortium (NASDCTE_c)*
- Non-profit established in 1920 to represent the state and territory heads of secondary, postsecondary and adult career technical education (CTE) across the nation
- Through leadership, advocacy and partnerships, support an innovative, high-quality CTE system

CTE's Broad Scope



Career Technical Education prepares students of any age with the academic and technical skills, knowledge and training necessary to succeed in future careers and to become lifelong learners

- From early career exploration to highly technical training
- Includes all sectors and professions

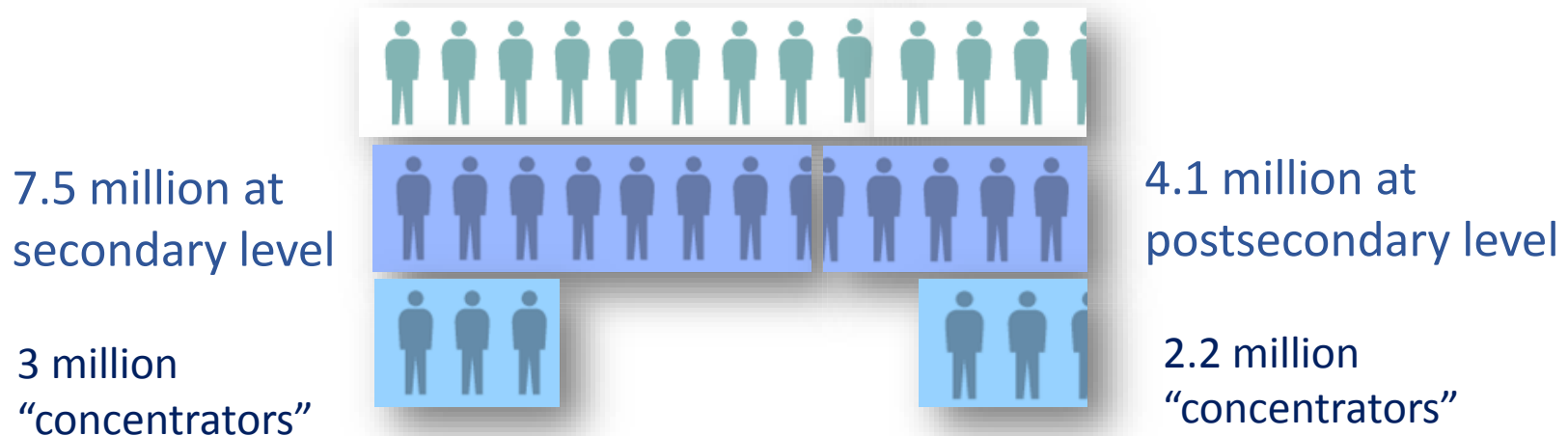
CTE's Organizing Framework



Agriculture	Hospitality/Tourism
Architecture/Construction	Human Services
Arts/Communication	IT
Business	Law/Public Safety
Education	Manufacturing
Finance	Marketing
Government	STEM
Health	Transportation

CTE in the U.S.

**11.7 million students participating in CTE
(2012-13)**



CTE's Delivery



- **Secondary** CTE is delivered at comprehensive high schools, technical centers, career academies and technical high schools
 - 85% of high school students in the class of 2009 took at least 1 CTE course
- **Postsecondary** CTE is delivered at technical/community colleges, vocational schools
 - In 2013, about 1.1 million learners earned associate's degrees and another 665,000 earned certificates or other credentials at public postsecondary institutions (half in technical fields)

Top 5 Major Trends in CTE

Trend 1: Career Readiness for All Students

4 in 5

employers report gaps in recent HS grads preparation



9 in 10

Parents want more career focus in high school

CTE concentrators are far less likely to drop out of high school – with estimated saving the economy **\$168 billion** each year

1 in 5

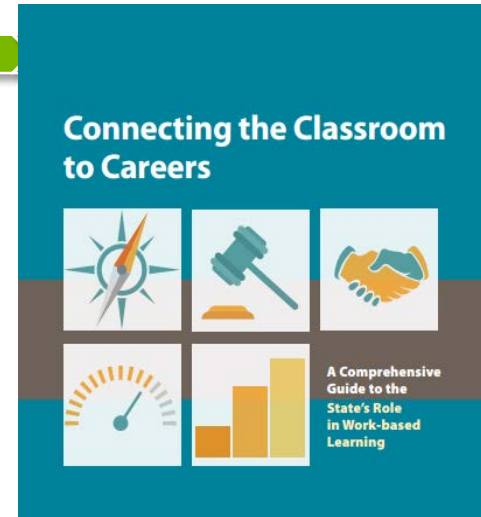
Students concentrate in CTE

Trend 1: Every Student Succeeds Act

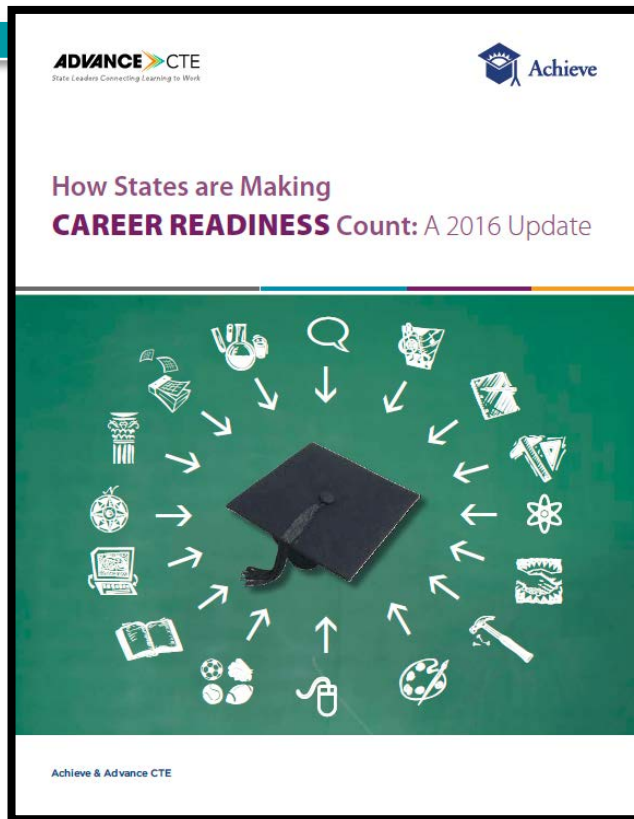
- Title I:
 - “Well-Rounded Education” now includes CTE
 - Academic and CTE standards alignment
 - ESSA and Perkins plan coordination required
 - Local applications *must* focus on effective student transitions and *may* focus on work-based learning
 - “Fifth indicator” in accountability

Trend 1: Career Readiness for All Students

- Focus on providing work-based/ experiential learning for all
- Strategy for ensuring professional/ career-ready skills
- State role:
 - Set a statewide (or district or school-wide) vision
 - Leverage intermediaries
 - Address legal and liability barriers
 - Measure work-based learning for continuous improvement
 - Bring work-based learning to scale



Trend 1: State Use of Career-Ready Indicators



- New Skills for Youth – Career Readiness Expert Working Group

Trend 1: Career Readiness for All Students



- Consistent state action on career development and advisement
 - Middle grades
 - Leveraging technology
 - Career coaches
 - Guided pathways

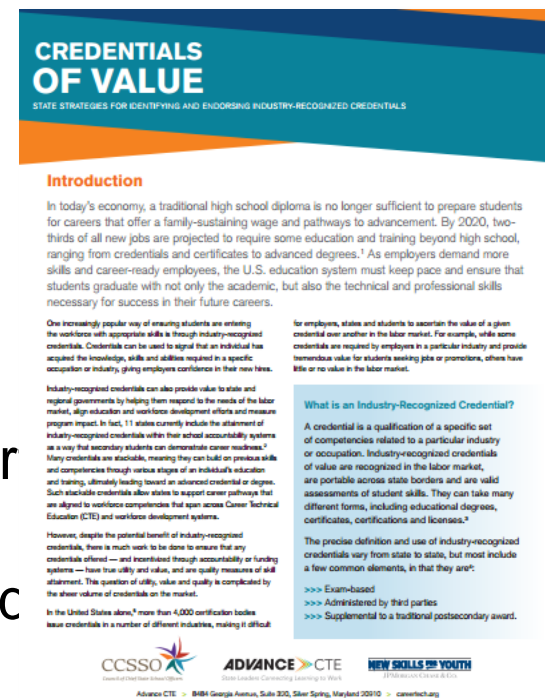
Trend 2: Focus on Quality



- Equity
 - Access for all students to high-quality pathways
 - Use of data
 - Rural vs. urban access
- Validation
 - Role of employers
 - Use of labor market data
- Program approval & funding

Trend 2: Focus on Quality

- Credentials of value (industry-recognized credentials)
- 4000+ certification bodies
- Question of value, utility, quality
- Lessons learned:
 - Business and industry brought in early;
 - Credential review process involves a concerted cross-institutional effort;
 - Credentials differentiated based on rigor and industry demand; and
 - Systems are designed to be adaptive.



Trend 3: Shifting Authority



- In federal legislation:
 - Diminished Secretarial Authority
 - Many more “may’s” than “shall’s”
- Lots more activity in states than at federal level

Trend 3: State Activity: 2013- 2015

- Between 2013 and 2015, every state and DC passed at least one policy impacting CTE
 - 400+ different policies in just a three-year period
- Common Areas of Focus:
 - New funding for CTE programs or initiatives;
 - Support and incentivize business-education partnerships and work-based learning; and
 - Industry-recognized credentials.



Trend 3: State Activity: 2016-2017



- CTE referenced in 48% of Governors' State of State addresses in 2016
- Nearly 280 CTE-related bills, initiatives, grants, etc. proposed in 2016; about half passed
- Many CTE-related bills, rules or budgets already slated for 2017

Trend 4: Systems Alignment



- WIOA, ESSA, Perkins encourage “shared” accountability
 - Combined state WIOA/Perkins plan
 - Required coordination
 - Integrated report cards
- Career Pathways

Trend 5: STEM and CTE



- What do STEM and CTE have in common?
 - Problem-based/project-based learning
 - Secondary-postsecondary alignment / college and career readiness
 - Business-education partnerships
 - Use of technology
 - Integrated/Cross-Disciplinary

Trend 5: STEM and CTE



- Significant interest/commitment to STEM education at all levels
- CTE programs can provide a strong foundation for and serve as a delivery system of STEM competencies and skills for a broader range of students.
- May not address everything within a STEM strategy, but policymakers, educators shouldn't be reinventing the wheel
- Stakeholders need to understand inherent connection and overlap in goals and content of STEM and CTE

CTE Is Your STEM Strategy



CTE Is Your STEM Strategy
NASDCTE
www.careertech.org
December 2013



According to an analysis by the Georgetown Center on Education and the Workforce, however, the STEM skills gap is actually more about a gap in those STEM competencies among workers than about a gap in the number of STEM workers. "The concern for STEM shortages tends to focus on the possibility of an insufficient supply of STEM workers, but the deeper problem is a broader scarcity of workers with basic STEM competencies across the entire economy. Demand for the core competencies is far greater than the five percent traditional STEM employment share suggests, and stretches across the entire U.S. job market, touching virtually every industry."

In addition, a recent report from the Brookings Institute estimates that as of 2011, 26 million U.S. jobs—20 percent of all jobs—require a high level of knowledge in any one STEM field, only half of which require a bachelor's degree but nearly all of which pay well above the national median salary.⁵

One benefit of viewing STEM through this CTE lens is that it allows for a broader understanding of STEM, an understanding that extends beyond just engineering or the traditional science disciplines, which is how STEM is all too often narrowly defined and implemented. It also allows states, districts and schools to build their STEM strategies based on existing efforts rather than adding another new initiative to the mix.

The policy brief will explore:

- The elements of a high-quality CTE program of study that makes it an effective tool for delivering or implementing STEM education;
- How STEM is naturally embedded across the 16 Career Clusters[®];
- Examples of states embracing the link between CTE and STEM; and
- Areas where CTE and STEM programs can learn from and strengthen one another.

DEFINING STEM

There are many ways to define STEM education. For some, STEM is all about getting more students interested in and prepared for the engineering fields. Another common interpretation focuses on building applications within traditional science courses. The Next Generation Science Standards (NGSS), for example, offer this: "The [NGSS] represent a commitment to integrate engineering design into the structure of science education by raising engineering design to the same level as scientific inquiry when teaching science disciplines at all levels, from kindergarten to grade 12. There are both practical and inspirational reasons for including

CTE Is Your STEM Strategy explores...

- The elements of a high-quality CTE program of study that makes it an effective tool for delivering or implementing STEM education;
- How STEM is naturally embedded across the 16 Career Clusters[®];
- Examples of states embracing the link between CTE and STEM; and
- Areas where CTE and STEM programs can learn from and strengthen one another.

STEM Across Career Clusters

CAREER CLUSTER	SAMPLE STEM CAREERS	CAREER CLUSTER	SAMPLE STEM CAREERS
Agriculture, Food & Natural Resources	<ul style="list-style-type: none"> • Agriculture Technicians • Agriculture Engineers • Forest & Conservation Workers • Food Science Technicians • Veterinarians • Marine Biologists • Water Resource Specialists 	Architecture & Construction	<ul style="list-style-type: none"> • Architects • Civil Engineers • Civil Engineering Technicians • Surveyors • Drafters • Cost Estimators
Arts, A/V Technology & Communications	<ul style="list-style-type: none"> • Graphic Designers • Telecommunications • Multimedia Artists & Animators • Audio Technicians 	Business Management & Administration	<ul style="list-style-type: none"> • Accountants • Auditors • Operations Research Analysts
Finance	<ul style="list-style-type: none"> • Actuaries • Financial Analysts • Financial Planners • Loan Officers • Investment Bankers 	Government & Public Administration	<ul style="list-style-type: none"> • Patent Officer • Cryptographers • Policy Analysts • Climate Change Analysts • Intelligence Analysts

STEM Across Career Clusters

CAREER CLUSTER	SAMPLE STEM CAREERS	CAREER CLUSTER	SAMPLE STEM CAREERS
Information Technology	<ul style="list-style-type: none"> • Programmers • Hardware, Software Engineers • Computer Support Specialists • Information Security Analysts • Database Administrators • Webmasters • Video Game Designers 	Law, Public Safety, Corrections & Security	<ul style="list-style-type: none"> • EMTs • Firefighter/Inspectors • Fire-Prevention and Protection Engineers • Brownfield Redevelopment Specialists and Site Managers
Manufacturing	<ul style="list-style-type: none"> • Aircraft Mechanics and Service/Avionics Technicians • Automotive Mechanics • Mechanical Engineers • Electronics Engineering Technicians • Wind Turbine Service Technicians • Welders 	Marketing	<ul style="list-style-type: none"> • Interactive Media Specialists • Market Researchers • Forecasting Managers • Inventory Manager/Analysts
STEM	Any/all of careers listed	Transportation, Distribution & Logistics	<ul style="list-style-type: none"> • Transportation Planners • Transportation Engineers • Occupational Health and Safety Technicians

Green & Sustainability Knowledge & Skills

- The result are four Green & Sustainability standards that apply across all 16 Career Clusters
- Career Cluster-specific standards in six areas identified as those being the most likely to experience the greatest need for green and sustainability workers
 - Agriculture, Food, & Natural Resources;
 - Architecture & Construction;
 - Information Technology;
 - Manufacturing;
 - Science, Technology, Engineering & Mathematics; and
 - Transportation, Distribution & Logistics

National Efforts Supporting CTE

NEW SKILLS FOR YOUTH

JPMORGAN CHASE & CO.

- Goals of State Competition

- To dramatically increase the number of students in the U.S. who successfully complete career pathways that begin in secondary school and culminate in postsecondary degrees and/or industry credentials with labor market value; and
- Catalyze transformational approaches to the design and implementation of programs and policies
- 10 states received Phase Two grants of \$2m/3 years
 - Delaware, Kentucky, Louisiana, Massachusetts, Ohio, Oklahoma, Nevada, Rhode Island, Tennessee, Wisconsin

Putting Learner Success First

Putting Learner Success First:
A Shared Vision for the Future of CTE



U.S. CHAMBER OF COMMERCE FOUNDATION



NATIONAL SKILLS COALITION



NASBE

National Association of State Boards of Education



Center for Global Education



Lingering Challenges



- Inconsistent quality of programs
- Short-term vs. long-term labor market demand
- Inadequate data systems and quality measures
- Teacher recruitment and retention
- Stigma as lesser-than option for students

Questions?



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