

# ACT WorkKeys, Career Pathways, and STEM Learning Ecosystems

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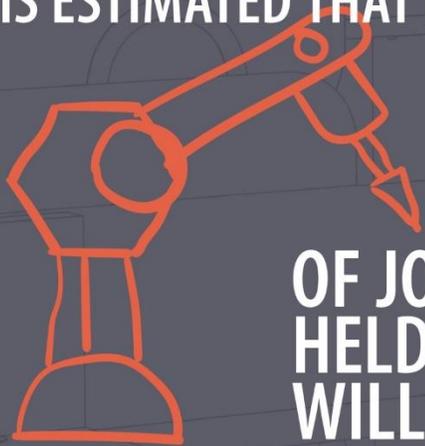


Together we can bolster  
creative minds and smart  
hands and create future-ready,  
lifelong learners.



# THE ROLE OF TECHNOLOGY IN THE WORKFORCE

IT IS ESTIMATED THAT BY 2030,



**38%**

OF JOBS CURRENTLY HELD BY US WORKERS WILL BE AUTOMATED.

While tech advancements offer opportunity in the creation of new jobs, it also means employers don't know exactly what skills they will require in the future.

A photograph of a young man with glasses and a young woman working together on a project in a classroom or workshop. They are surrounded by various electronic components and tools. The image is overlaid with a semi-transparent orange filter.

WHAT EMPLOYERS ARE SURE OF IS THEY WILL NEED CRITICAL THINKERS WHO CAN FIND SOLUTIONS TO PROBLEMS THAT WILL NOT BE WRITTEN IN A MANUAL.

# OUR CONNECTED WORLD

BY THAT TIME, THERE WILL BE



# 500 BILLION

DEVICES IN THE WORLD CONNECTED TO THE INTERNET.

Students are interacting with technology more, without much knowledge about the programming and moving parts that compose it.



AND AS STUDENTS INTERACT WITH PEOPLE LESS, THEY ARE MISSING OPPORTUNITIES TO PRACTICE MANAGING EMOTIONS, CELEBRATING MILESTONES, SHOWING EMPATHY, AND BUILDING CONFIDENCE.



# THE ENGAGEMENT GAP

PLUS, HOUSTON...  
WE HAVE AN  
ENGAGEMENT  
PROBLEM.

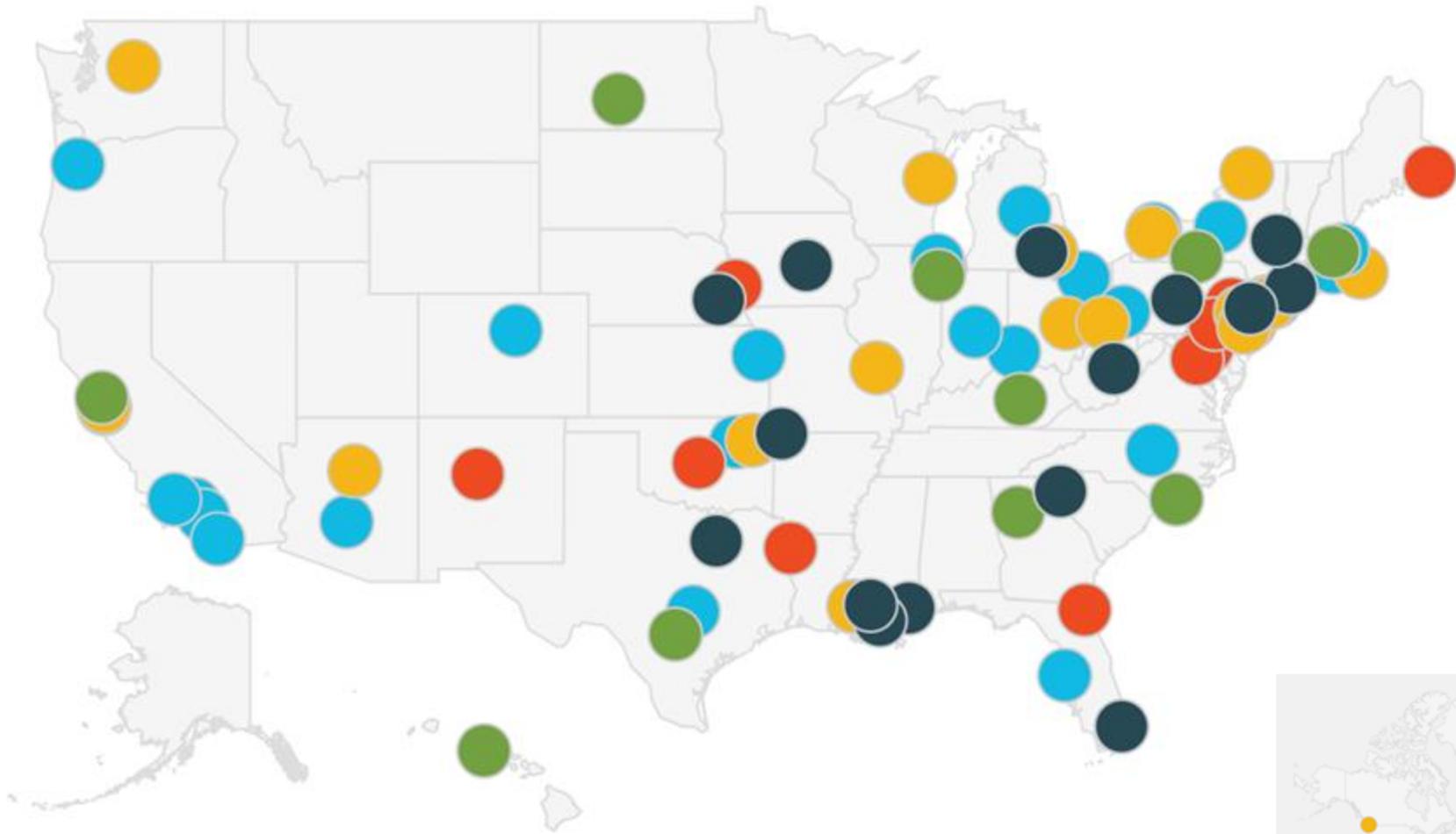
ONLY  
**49%**

OF US PUBLIC SCHOOL  
STUDENTS ARE ENGAGED  
IN SCHOOL.

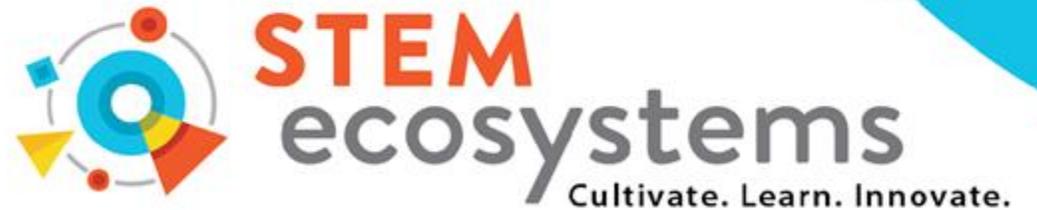
AS TEACHERS STRUGGLE  
TO KEEP STUDENTS  
ENGAGED, THEY ARE  
ALSO BEING ASKED  
TO SOLVE PROBLEMS  
THEY'VE NEVER HAD  
TO BEFORE, SUCH AS  
AS PROVIDING SAFETY  
FOR STUDENTS AND  
TEACHING SOCIAL AND  
EMOTIONAL LEARNING.

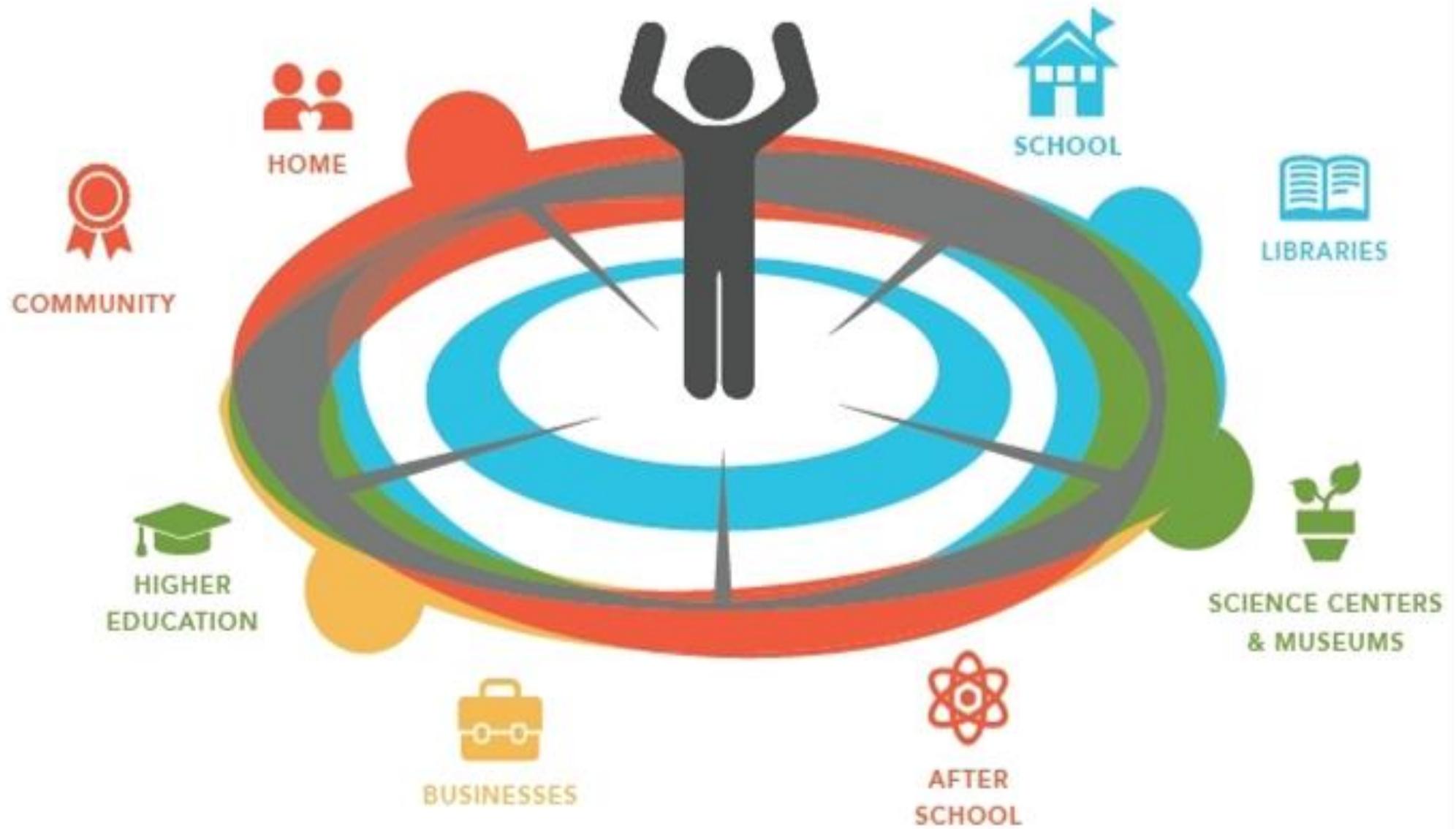






# WHAT IS AN ECOSYSTEM?







Tulsa Regional  
STEM Alliance



Tulsa Regional  
STEM Alliance







# BoSTEM



**Boston students enthused about  
Science, Technology, Engineering and Math**



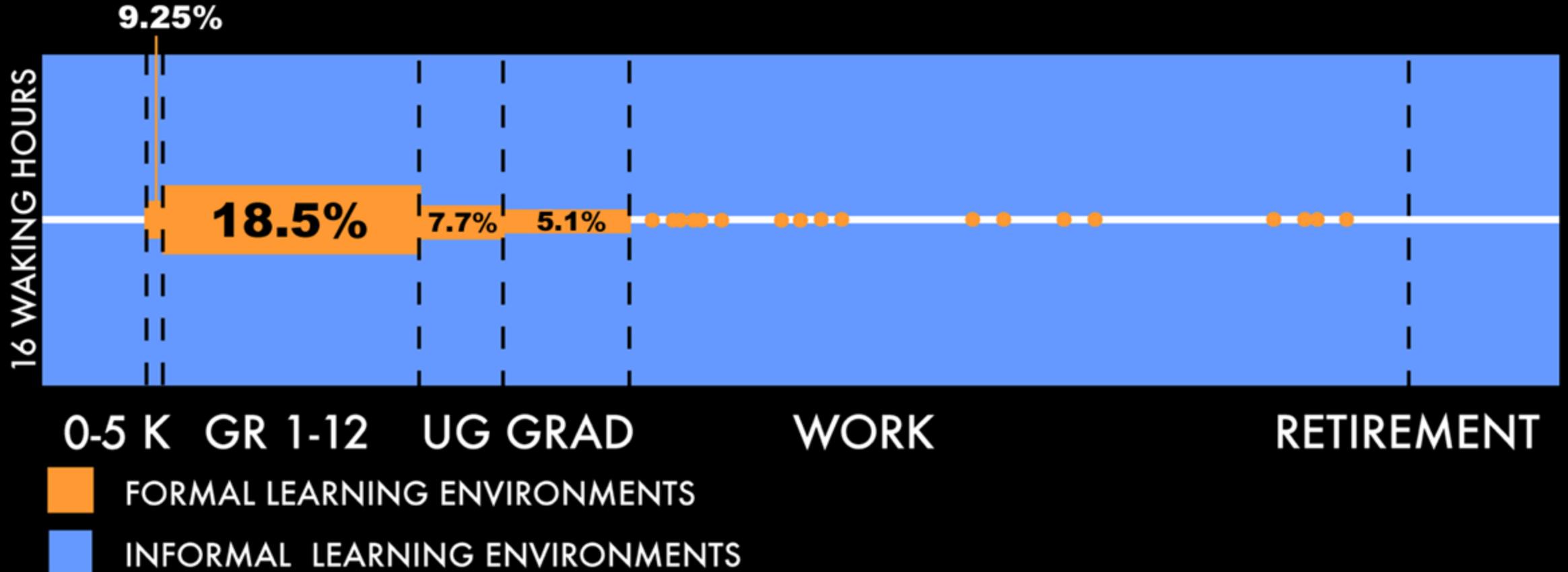
# WHY ECOSYSTEMS?



**STEM**  
ecosystems  
Cultivate. Learn. Innovate.



# LIFELONG AND LIFEWIDE LEARNING





**...providing the architecture for all sectors to align opportunities for all learners to develop the skill sets necessary to thrive in a 21st century economy and beyond.**



“No single individual or organization can influence the entire ecosystem alone.”



“There is no one solution that will create progress at scale.”

*Input to Impact: A Framework for Measuring Success the STEM Talent Ecosystem.*  
STEMConnector. 2019



# The World is Complex.

*We figure it out together.*

**STEM Ecosystems reimagine learning for the future.**



**Establish and  
sustain cross-sector  
partnerships**

**Create and connect  
STEM-rich learning  
environments in  
diverse settings**

**Equip educators  
to lead active learning  
in diverse settings**

**Support youth to  
access pathways and  
exploration to further  
learning and careers**

*Partnerships to Transform STEM Learning (Noam & Tillinger, 2004)*





**NCE**East Alliance

# NCEast Mission

**To drive the region's current and future economic development through three core strategies:**

- ✓ Creating growth through targeted business attraction, retention and entrepreneurship promotion - branding, marketing, and professional prospect management
- ✓ Building Capacity by improving labor skills in the region, enhancing education rates, and supporting infrastructure improvements
- ✓ Advocating for our institutions, infrastructure needs and communities



# THE WALL STREET JOURNAL.

How

American employers do not have enough applicants with adequate skills, especially in science, technology, engineering and math.

...most people don't think of as STEM-related, including machinists, electricians, auto techs, medical technicians, plumbers and pipefitters.

Each year, approximately 30% of high-school graduates who take the Armed Forces entrance exam fail the test.

...many applicants fail these basic tests, losing out on opportunities for good pay and good benefits

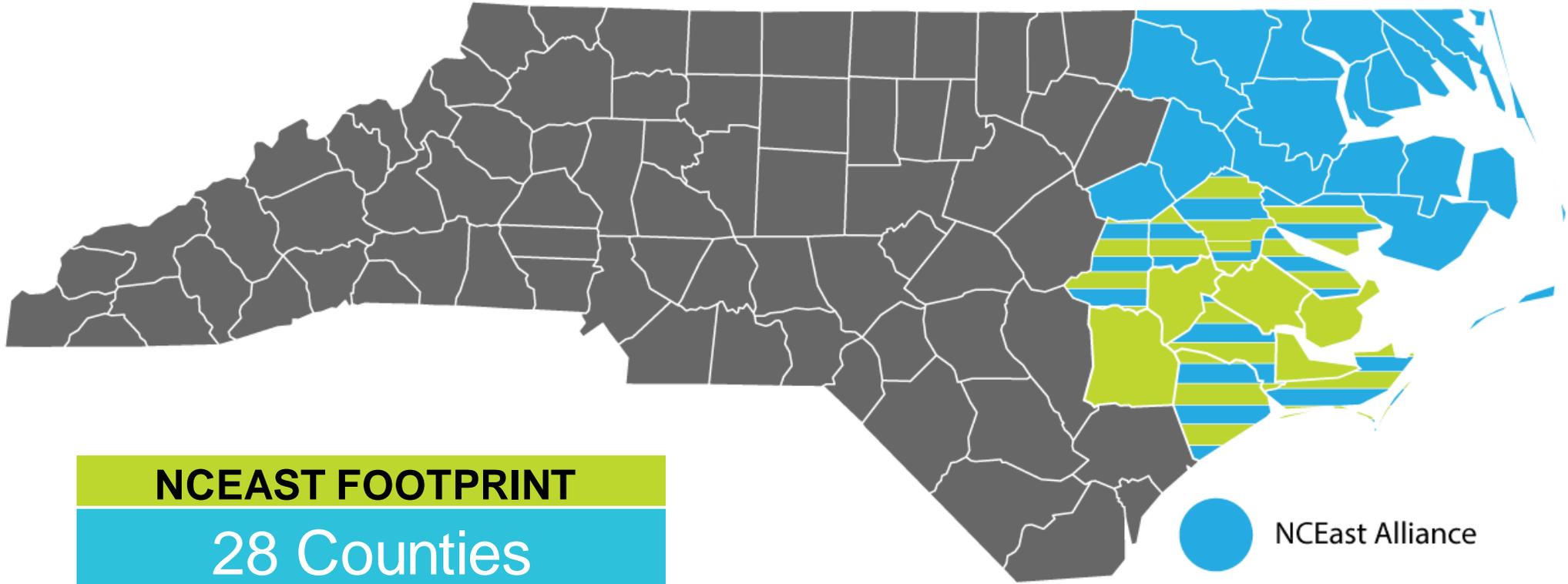
...many of these educational shortfalls are apparent before students reach high school.

...only 35% of eighth graders performed at grade level or above in math.

away applicants

of teachers;

With these education standards under attack in many states where they have been adopted or are being considered, the Common Core needs



**NCEAST FOOTPRINT**

**28 Counties**

With approximately 1.4 million residents from the fringe of the Research Triangle to the Atlantic Coast

-  NCEast Alliance
-  STEM East Network
-  NCEast Alliance\STEM East

# Regional Workforce Deficiencies Identified

North Carolina's Eastern Region launched a visioning and strategic planning effort in 2004

Two of six strategies adopted included efforts to:

- Promote value of education (culture of learning)
- Improve skills of adult workforce

Employment growth in advanced manufacturing was going to place greater stress on the education/workforce delivery system



# Workforce Innovation Network – 2005/06

Cooperative effort – regional collaboration

- NC Eastern Region (NCEast predecessor)
- Eastern Carolina Workforce & Turning Point Development Boards
- 7 Community Colleges
- ESC/JobLink Centers

Focused on:

- Employer engagement and regional workforce needs
  - Attract and retain industry and connect exiting military personnel to jobs available in the region

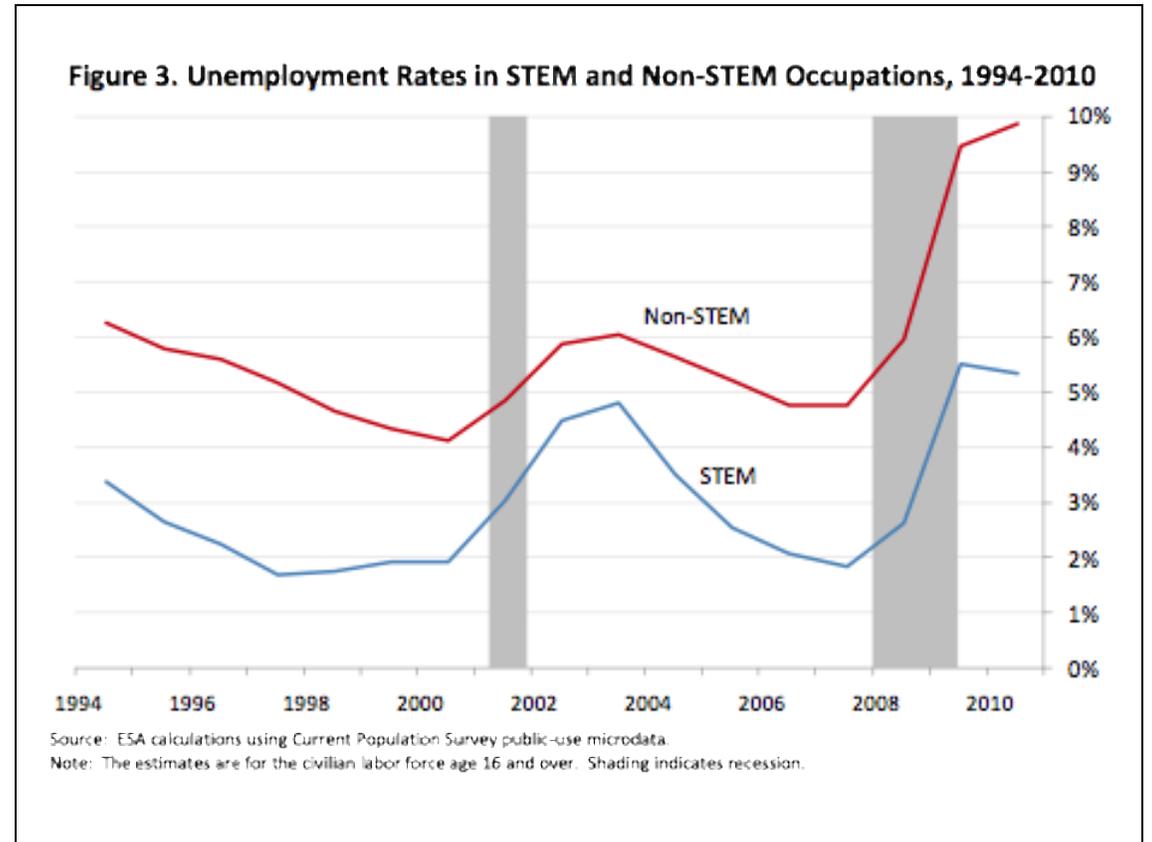
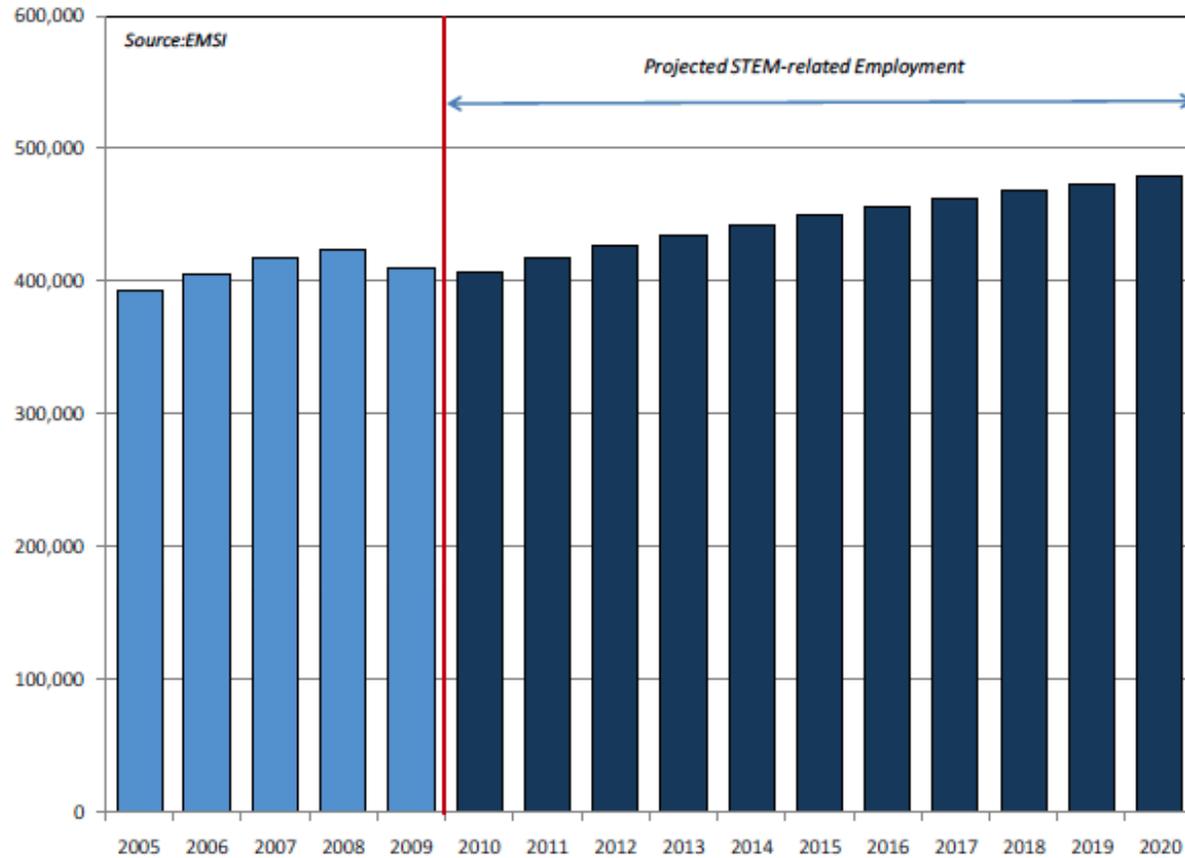


# NC WORKFORCE STUDY 2011-2020

- At least 42% of the new jobs being created in NC will require some form of certification or post-secondary education, many in STEM (Science, Technology, Engineering and Math) disciplines.
- May underestimate need - employers are accelerating replacement lower-skilled workers with automation requiring more highly educated or trained employees.
- Economic drivers (manufacturing, logistics, finance, technology) are heavily dependent on STEM – and STEM-based occupations and more likely to survive recessions and receive higher pay



# STEM-RELATED EMPLOYMENT IN NC

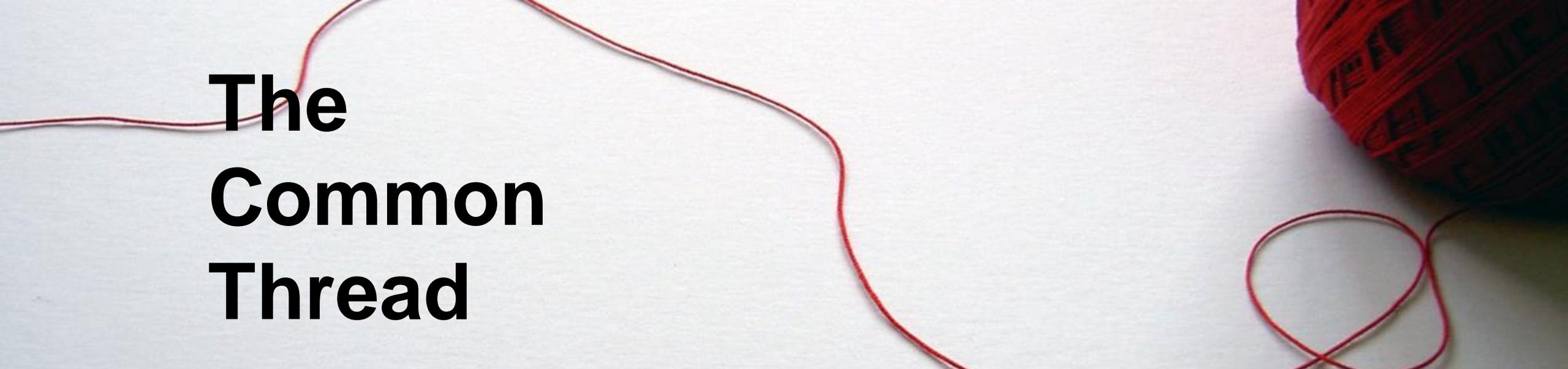


**Table 1. Average Hourly Earnings of Full-Time Private Wage and Salary Workers in STEM Occupations by Educational Attainment, 2010**

	Average hourly earnings		Difference	
	STEM	Non-STEM	Dollars	Percent
High school diploma or less	\$24.82	\$15.55	\$9.27	59.6%
Some college or associate degree	\$26.63	\$19.02	\$7.61	40.0%
Bachelor's degree only	\$35.81	\$28.27	\$7.54	26.7%
Graduate degree	\$40.69	\$36.22	\$4.47	12.3%

Source: ESA calculations using Current Population Survey public-use microdata and estimates from the Employment Projections Program of the Bureau of Labor Statistics.





# The Common Thread

## Career Readiness Certification & Economic Development

- **Economic Development** – documenting workforce quality
- **Business and industry** – communicating needs for a productive workforce
- **Individuals** – understanding which skills are required by employers
- **Policy makers** – addressing skills gap at the national, state and local levels
- **Educators** – closing the skills gap with stackable industry-recognized credentials
- **Economic developers** – marketing the quality of their workforce



# Private/public partnerships

REGIONAL JOURNEY  
BEGAN BY EMBRACING  
ACT<sup>®</sup> WORKKEYS<sup>®</sup>  
AND NCRC IN 2005





NORTH CAROLINA'S EASTERN REGION  
**WORKREADY**  
COMMUNITIES



## BETTER JOBS. BETTER **WORKERS**. BETTER ECONOMY. WORKFORCE **READY**.

North Carolina's Eastern Region is leading a WorkReady initiative to elevate our region's workforce into our number one competitive advantage. By ensuring our workers have the best skills and training, we can guarantee businesses we have the talent they need to succeed now and in the future.

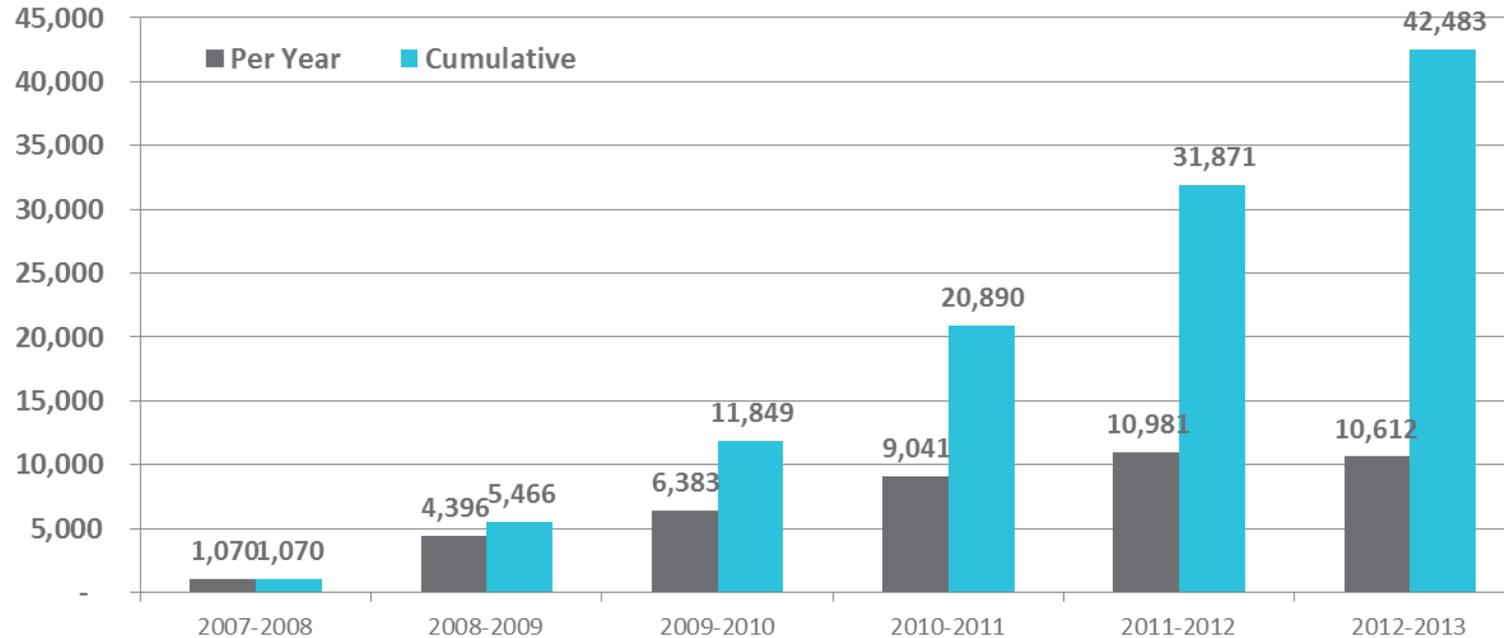
This ambitious plan, funded by a grant from the NC Rural Center, and in partnership with the Eastern Carolina Workforce Development Board, Corporation for Enterprise Development (CFED), and the North Carolina Community College System, will improve the skills and marketability of our workforce and ultimately bring growth to our communities. This plan is based on

This project will assess and award communities that meet Work Ready thresholds, evaluate the standards proposed for certification, motivate rural county participation, introduce the Work Ready Initiative to employers and capture the lessons learned at the regional level for potential application across the state.



# Career Readiness Certificates

Capacity building to address #1 site location issue:  
**Workforce**

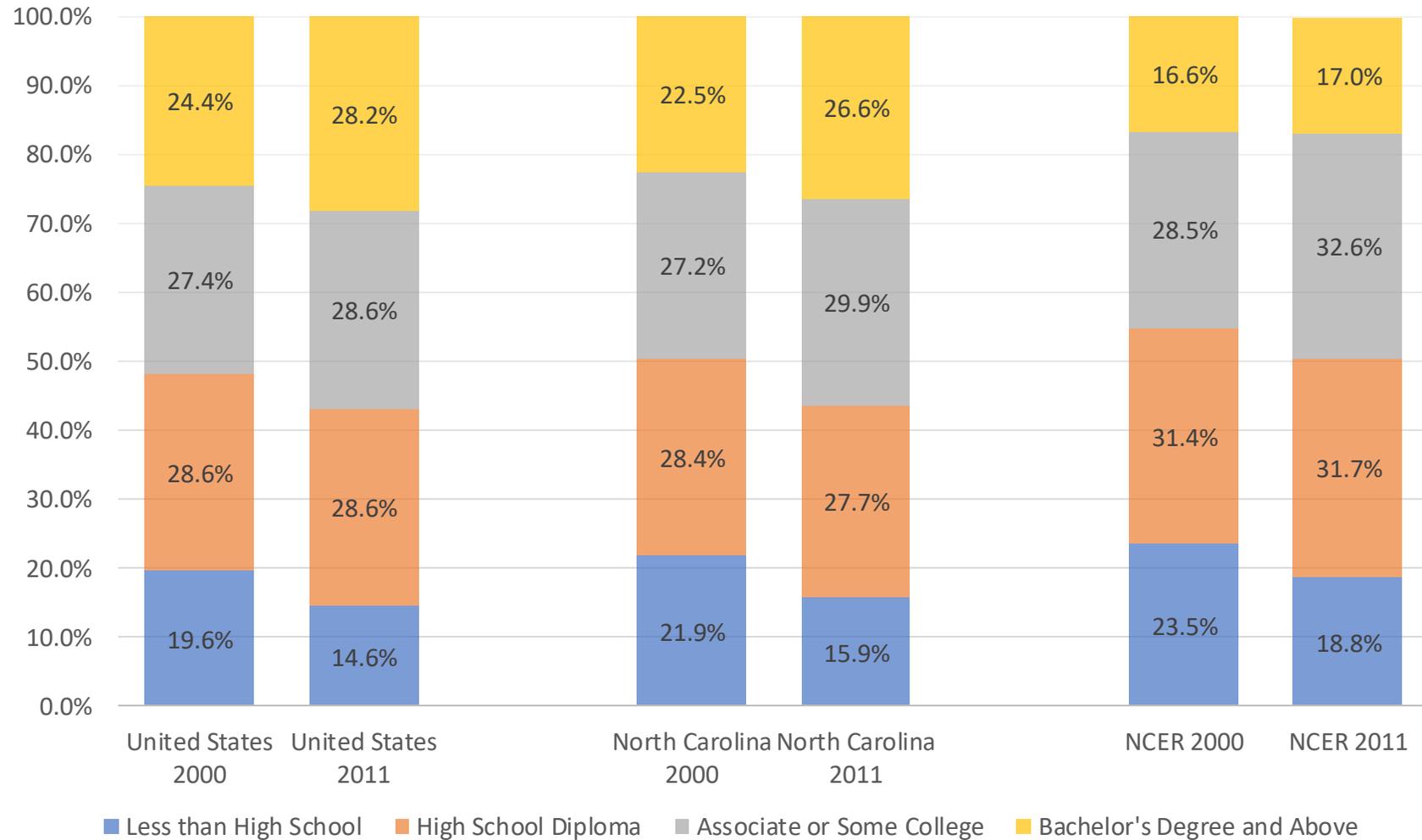


## CRCs Awarded

From < 20 employers recognizing the CRC to over 150



# Educational Attainment



Source: US Census Bureau, 2007-2011 American Community Survey 5-Year Estimates



# STEM Education

Community engagement survey in 2010

- Conclusion – need to focus on middle schools (create pipeline)

Convened regional team to develop Golden Leaf Foundation application on regional scale

Launched STEM East in 2011 with \$750k

- Initially 4 counties with 5 middle school STEM Learning Centers with overall goal to be in all middle schools in all 13 counties





**STEMEAST**

STRATEGIES > THAT > ENGAGE > MINDS®

NETWORK

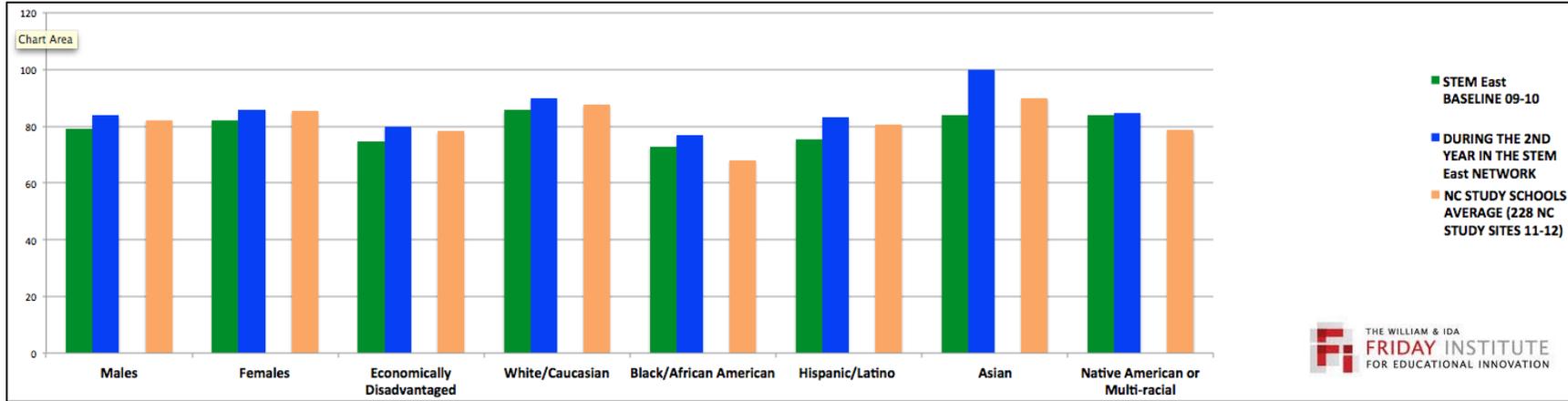
**The Eastern North Carolina  
Employers & Superintendents Council**

**CONNECTING EMPLOYERS & EDUCATORS** through a network of private/public partners to align innovative education programs with industry initiatives to support student career pathways, develop an educated workforce and add value for relocating and expanding companies.

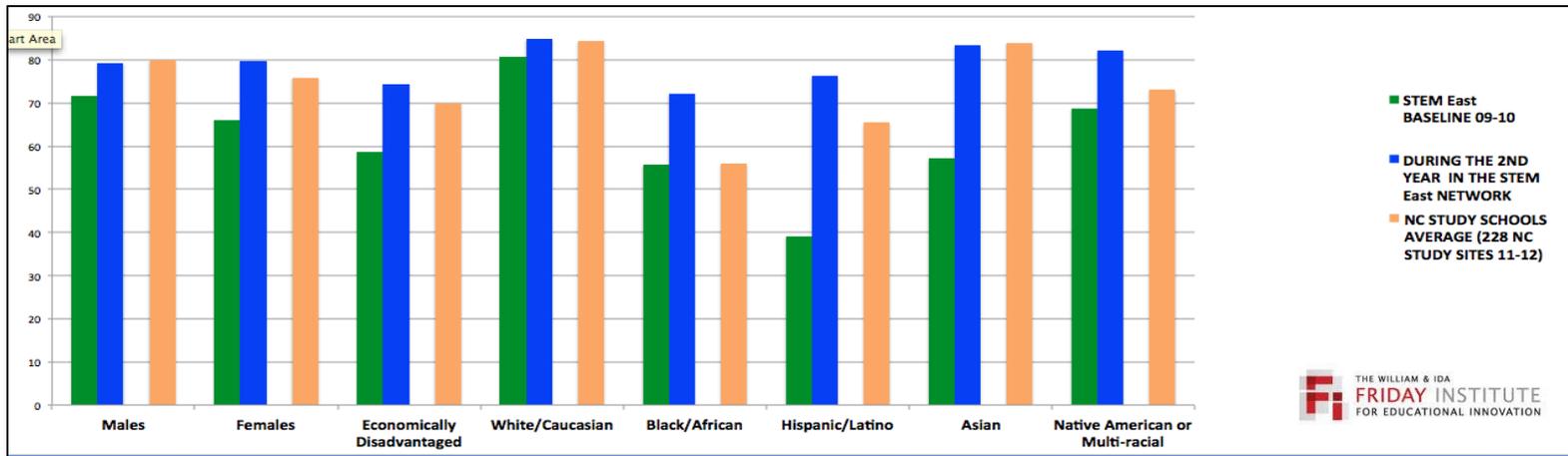


# NC's Eastern Region: STEM Results

Math Proficiency (Grade 8)



Science Proficiency (Grade 8)



# BIOTECHNOLOGY

Life Sciences Industries Cluster

## REGIONAL EMPLOYERS



**APPLIED MATHEMATICS 4\*** • **READING FOR INFORMATION 6\*** • **LOCATING INFORMATION 4\***

\*These workplace-readiness skills are commonly used in 80 percent of all occupations. The National Career Readiness Certificate ranks these skills in a range of levels: Applied Mathematics (3-7), Reading for Information (3-7), and Locating Information (3-6).

## CONNECTING EMPLOYERS, TEACHERS, AND STUDENTS

### AGRICULTURAL ENGINEERS

Applied Mathematics 7 • Reading for Information 6 • Locating Information 5

### CHEMISTS

Applied Mathematics 6 • Reading for Information 6 • Locating Information 5

### EPIDEMIOLOGISTS

Applied Mathematics 5 • Reading for Information 5 • Locating Information 5

### LABORATORY/DEPARTMENT TECHNICIANS

Applied Mathematics 4 • Reading for Information 5 • Locating Information 5

### NURSE ANESTHETIST/ANESTHESIOLOGISTS

Applied Mathematics 6 • Reading for Information 7 • Locating Information 6

### REGISTERED NURSES

Applied Mathematics 5 • Reading for Information 5 • Locating Information 4

## COUNCIL MEMBERS



Beaufort Public Schools • Carteret Public Schools • Craven Public Schools • Duplin Public Schools • Greene Public Schools • Jones Public Schools  
Lenoir Public Schools • Onslow Public Schools • Pamlico Public Schools • Pitt Public Schools • Wayne Public Schools



We are **CONNECTING EMPLOYERS, TEACHERS, AND STUDENTS**  
through a growing network of private and public partners.  
[www.STEMEAST.org](http://www.STEMEAST.org)



# Workforce Development

## ACT WorkKeys profiling

Pitsco's middle level STEM curriculum was the first curriculum profiled by ACT against the WorkKeys assessments



**NCEastAlliance**



# Measures of Academic Progress (MAP) Testing Results

Higher science scores two years in a row

- 2016-17 and 2017-18 School Years

North Carolina schools

- Year 1: Craven County (military district)
  - 20 percentile point increase
- Year 2: Bertie County (21% of population lives under the poverty line – national average is 14%)
  - 7 percentile point increase



THE WILLIAM & IDA  
**FRIDAY INSTITUTE**  
FOR EDUCATIONAL INNOVATION



# North Carolina STEM Centers

**14** School Districts  
Participating in the STEM East Network



**71** Elementary  
**131** Middle-Level  
Careers exposed to students in STEM Centers



**55** Sites  
**60** Programs  
STEM Centers in the network



**144,900**  
Students Served  
In the STEM Centers



**70**  
Business & Industry  
Partners  
Involved in the STEM East Network



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## Questions?

