



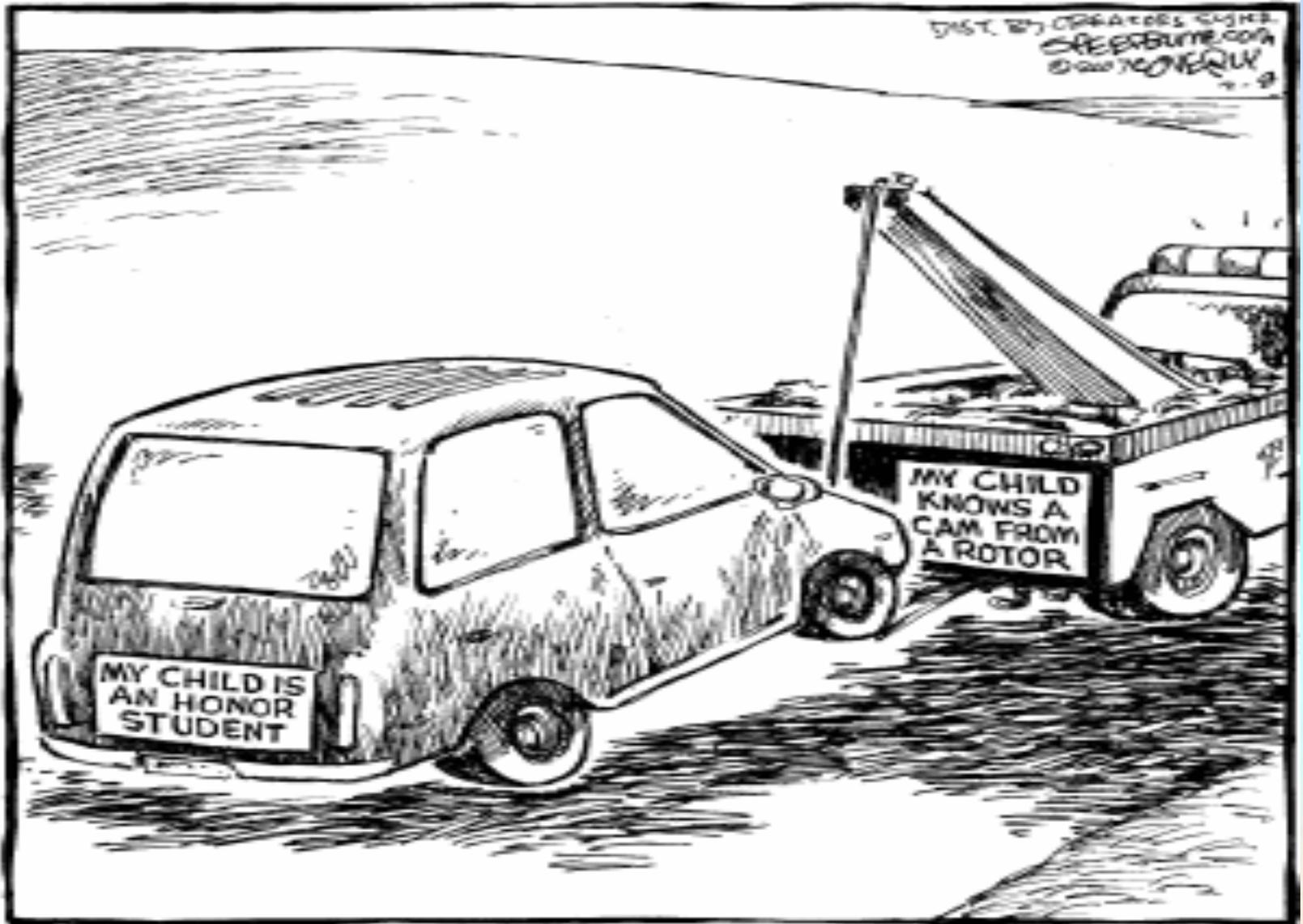
*College & Career Ready: A  
Conceptual Framework for  
Increasing Engagement,  
Achievement and Transition*

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# Seen stuck in traffic on A45 South



## **Two Key Questions:**

- 1. What is the appropriate mix of academic, occupational and technical skills required for the emerging labor market?**
- 2. How can schools help students develop these skills?**

# Defining College & Career Ready

- ▾ Whatever skills needed to succeed in credit bearing CC courses (Tucker, NCEE)
- ▾ Being ready for college means that a high school graduate has the knowledge and skills necessary to qualify for and succeed in entry-level, credit-bearing college courses without the need for remedial coursework. (Achieve Inc)
- ▾ 4 years of math, English; 3 years of science & social science (College Board)
- ▾ Skills needed for living-wage, entry level jobs are same as skill needed to succeed in college (ADP)

# **The Education Challenge**

- . Engagement - Completing secondary education; completing postsecondary credential**
- . Achievement - test scores and industry recognized credentials**
- . Transition - to continued education and training and/or the workplace**



# **THE EMERGING AMERICAN WORKPLACE**

## More STEM or . . .

- ▾ S&E occupations make up only about one-twentieth (**5%**) of all workers (5.3% in 2018), Urban Institute, 2007
- ▾ **435,000** U.S. citizens and permanent residents **a year** graduated with bachelor's, master's, and doctoral degrees in science and engineering. Over the same period, there were about **150,000** jobs added **annually** to the science and engineering workforce. .

[http://www.businessweek.com/print/smallbiz/content/oct2007/sb20071025\\_827398.htm](http://www.businessweek.com/print/smallbiz/content/oct2007/sb20071025_827398.htm)

Murray said that none of the companies she has talked with has suggested that there is a shortage of qualified chemists or life scientists. She said that **employers' greatest concern "is not numbers, it is training."** She cited the example of managers who told her they could interview hundreds of candidates for an organic chemistry position but wish they knew how to identify those candidates who **"can behave collaboratively"** and have the other broad competencies discussed at the workshop. She argued that the degree to which scientists have these other capabilities "really seems to be the problem."

## IS THERE A SHORTAGE OF SCIENTISTS?

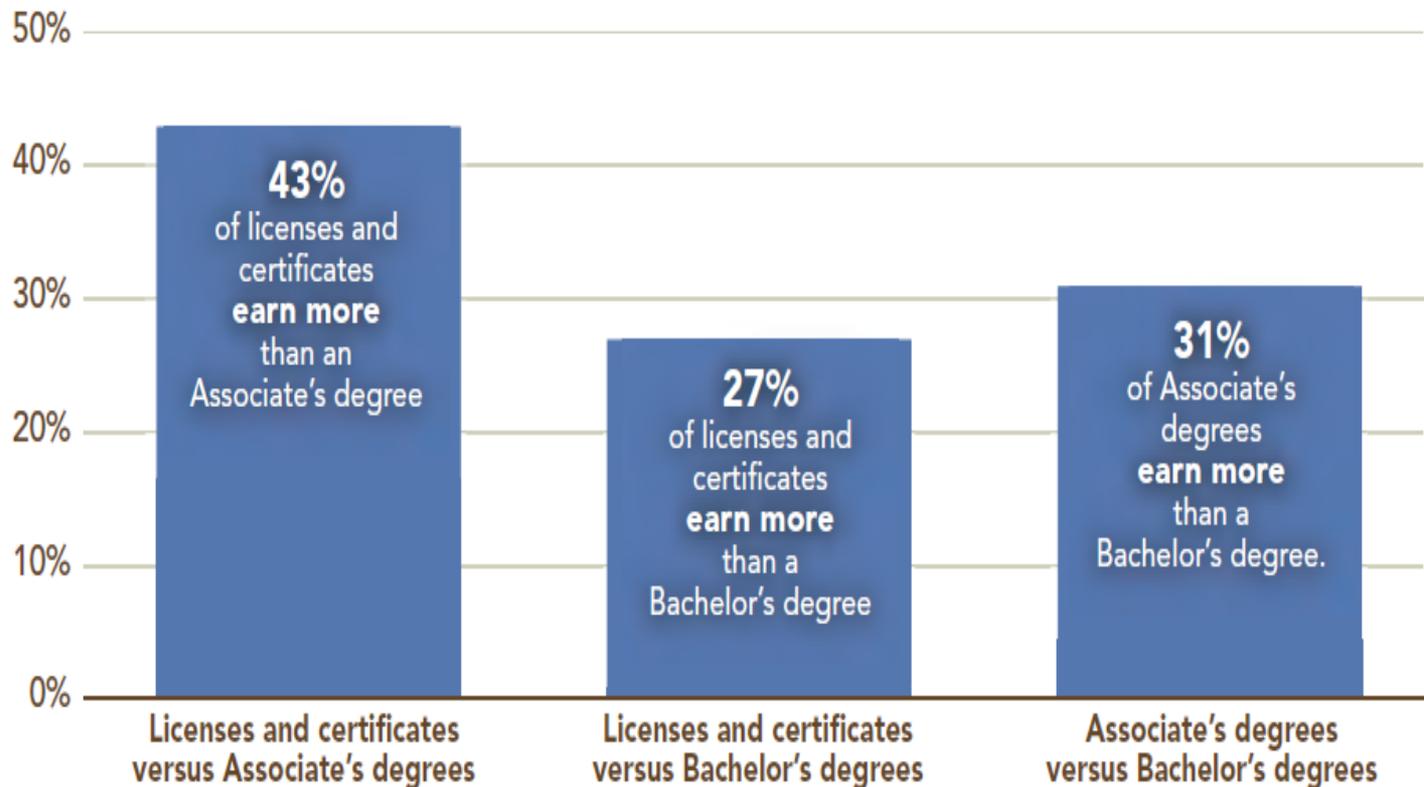
National Research Council. (2008). Research on Future Skill Demands: A Workshop Summary. Margaret Hilton, Rapporteur. Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

# Middle Skill Credentials Pay Off

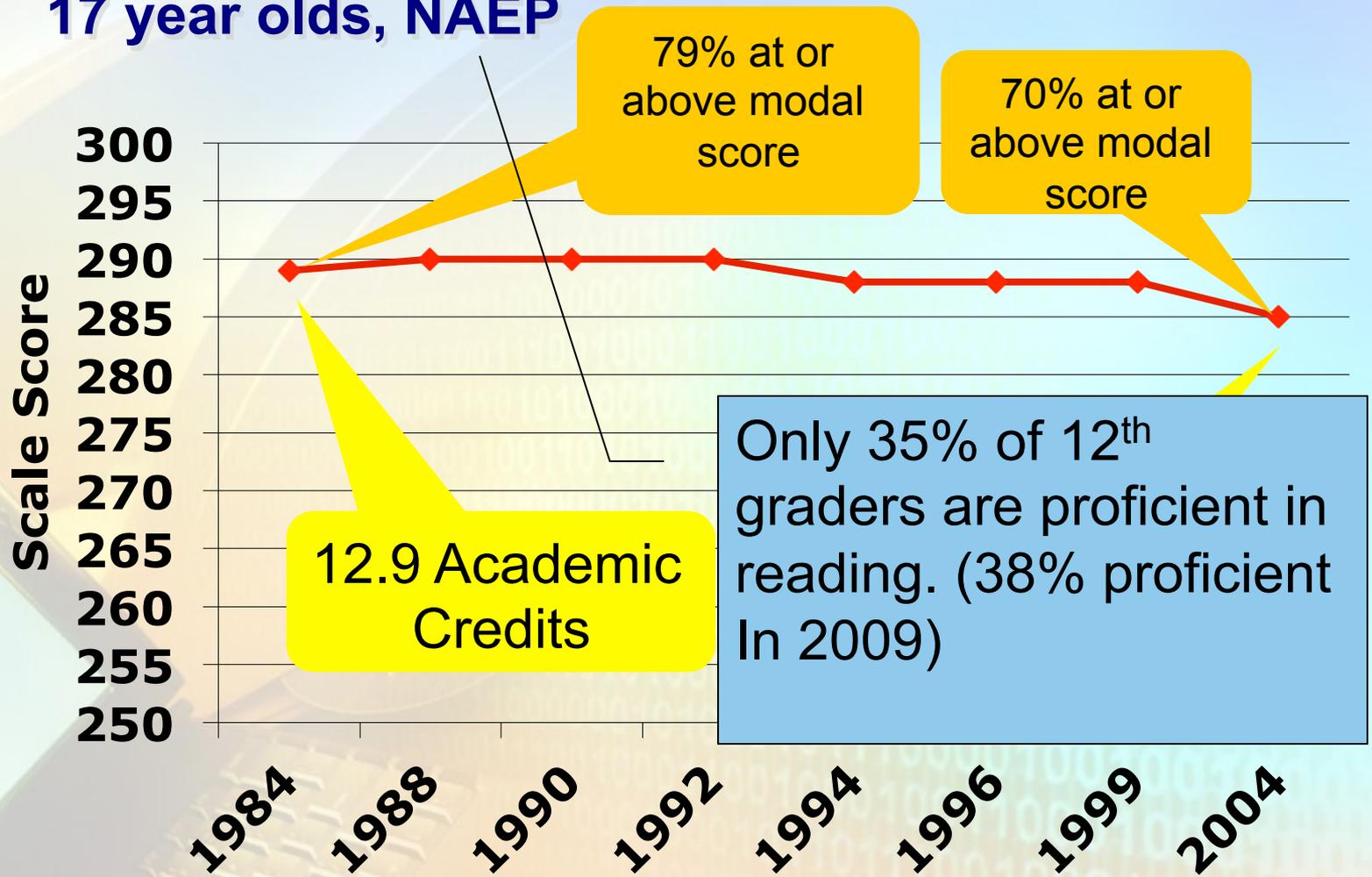
FIGURE 5.12

Earnings are not just a function of postsecondary attainment. Occupational choice also influences earnings potential.

Source: National Education Longitudinal Study 2000



# Achievement Flat or Declining in Reading, 17 year olds, NAEP



Note: Long-Term Trends NAEP

Source: NAEP 2004 Trends in Academic Progress.

# The College & Career Dilemma

## 9<sup>th</sup> Grade Cohort

- 100 enter 9<sup>th</sup> grade\*
- ▾ 70 complete HS
- ▾ 43 Start college

## Benchmarks

- ▾ 70% complete HS<sup>1</sup>
- ▾ 62% start college immediately<sup>2</sup>
- ▾ 47% drop out (31% with 0 credits)
- ▾ 57% complete within 6 years<sup>3</sup>

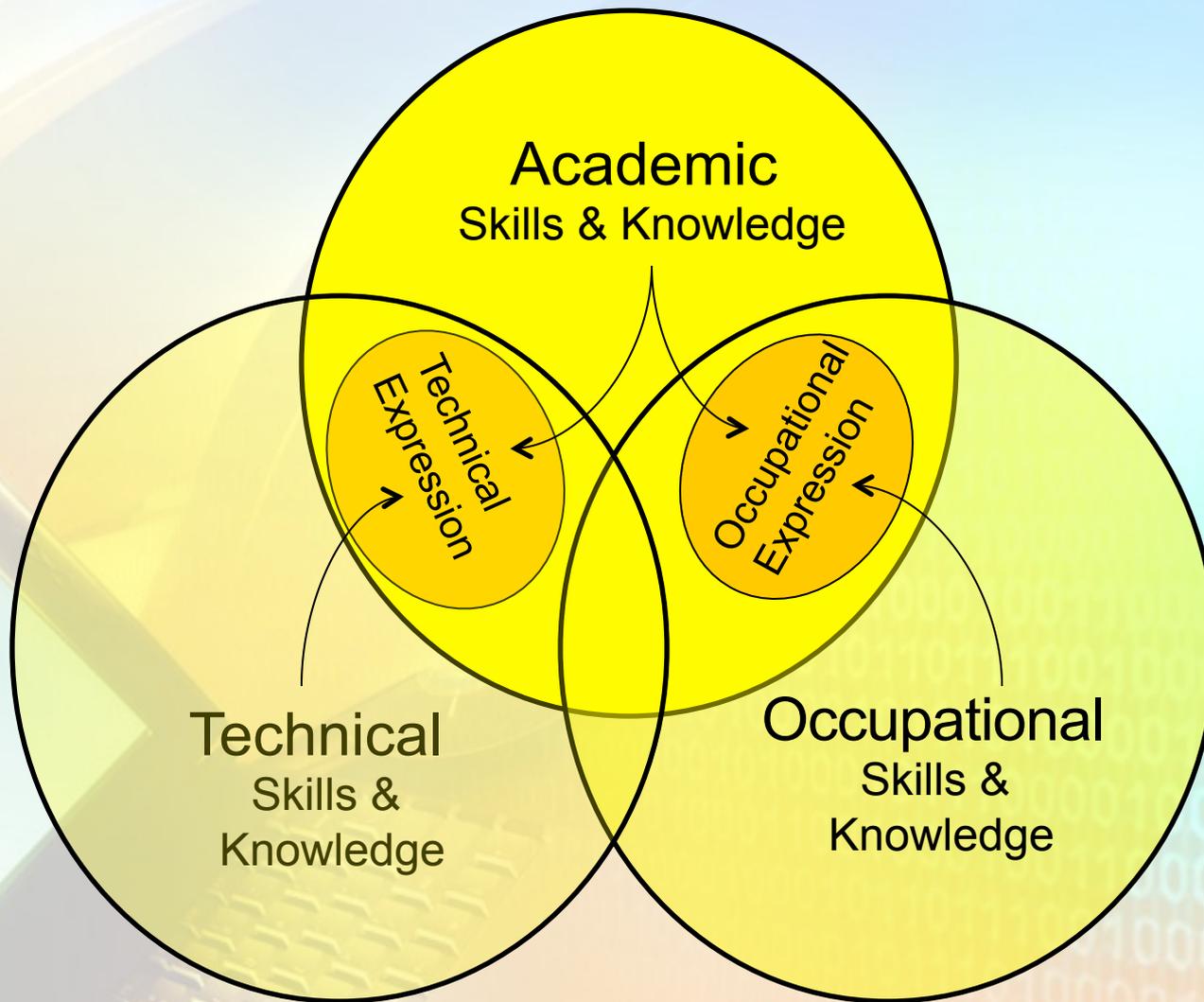
## Workforce Credentials

- 30% enter as HS drop outs
- 25% enter as HS grad
- 19% enter with some college & a lot of debt
- 18-24% enter with college degree (6/4;3/2)

1. Greene et al, 2006
2. NCHEMS, 2009 (2006)
3. NCES, 2010

\*An unknown number of pre-9th graders never make it to high school

# College & Career Ready: 3 Domains



1. Framework
2. Where skills are learned

# What Academic Skills?

**Academic**  
Skills & Knowledge

↘ College Ready  
Academic Skills

↘ Career Ready  
Academic Skills

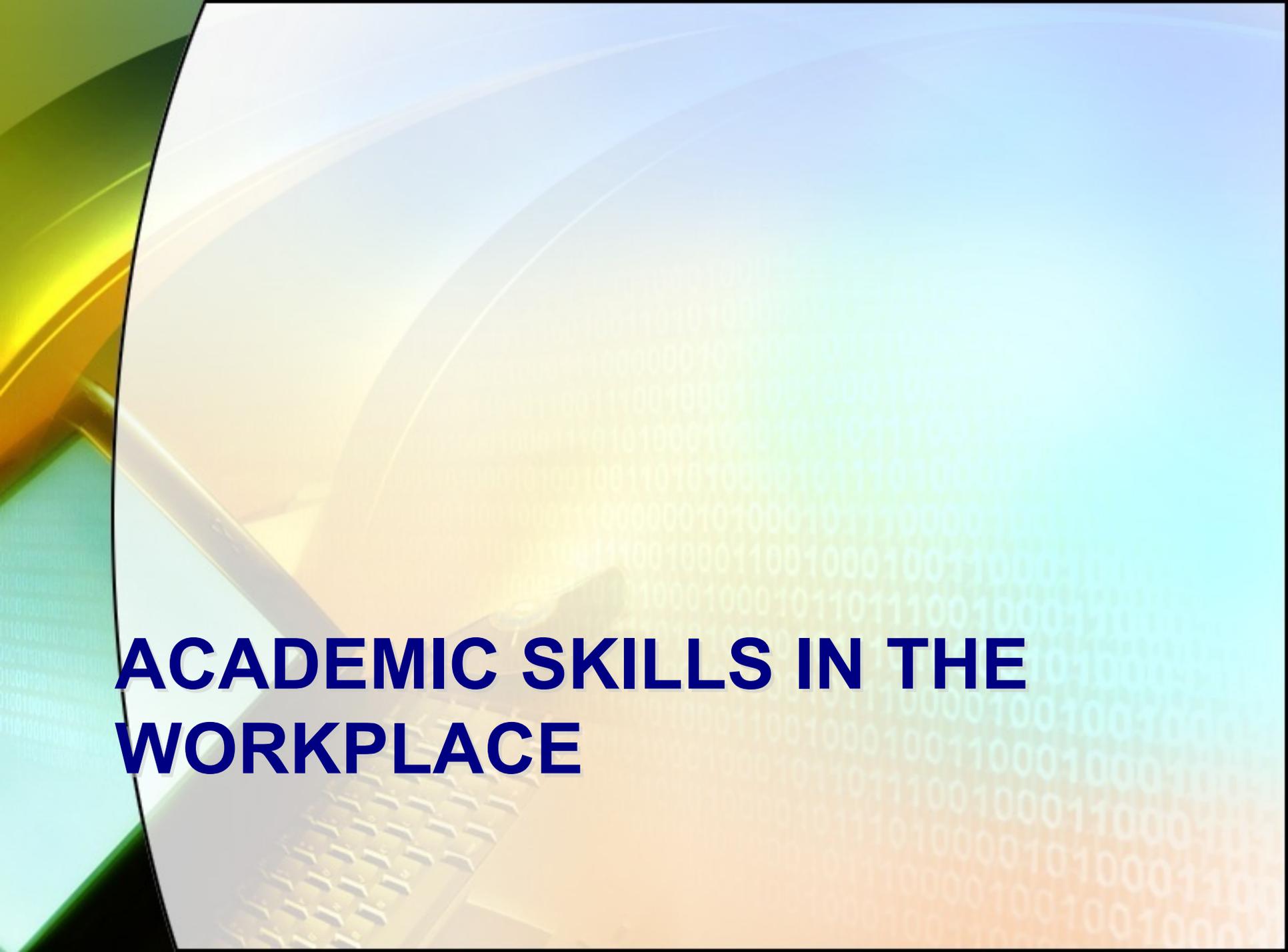
# Measuring College & Career Readiness

## College Ready?

- Using traditional assumptions (i.e., preparation for 4-year college), only **32%** of HS graduates are *college ready* (Greene, 2003)
- **28%** of 4-year college entrants require remediation (NCES, 2007)
- **50%** of HS grads (who take the ACT exam) are *college ready* (ACT, 2005)

## Career Ready (the academic side)?

- ACT *Work Readiness Assessment* (based on O' Net data) measures:
  - Reading for information
  - Locating information
  - Applied math



# **ACADEMIC SKILLS IN THE WORKPLACE**

# Academic Skills Needed for College are the Same Needed for Careers . . . ?

## Career Ready (the academic side)?

- ACT *Work Readiness Assessment* (based on O' Net data) measures:
  - Reading for information
  - Locating information
  - Applied math
- Zone 3 Jobs, Level 5 Math Skills

# Career ready math for Level 5 work

## ACT College & Work Readiness Brief (2008)

### Mathematics Skills for College and Workforce Training Readiness

Skill Group	ACT Mathematics Test College Readiness Standards (20-23 Range)	WorkKeys Applied Mathematics Test Skills (Level 5)
<p style="text-align: center;"><b>Algebra and Algebraic Thinking</b></p>	<p>Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average</p> <p>Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor</p> <p>Evaluate algebraic expressions by substituting integers for unknown quantities</p> <p>Add and subtract simple algebraic expressions</p> <p>Solve routine first-degree equations</p> <p>Perform straightforward word-to-symbol translations</p> <p>Multiply two binomials</p> <p>Evaluate quadratic functions, expressed in function notation, at integer values</p>	<p>Solve problems that include a considerable amount of extraneous information</p> <p>Calculate using several steps of logic</p> <p>Perform single-step conversions within or between systems of measurement</p> <p>Look up and use a single formula</p> <p>Calculate using mixed units (e.g., 3.5 hours and 4 hours 30 minutes)</p> <p>Find the best deal using one- and two-step calculations and then comparing results</p> <p>Calculate percentages, percentage discounts, or percentage markups</p> <p>Divide negative numbers</p> <p>Decide what information, calculations, or unit conversions to use to solve the problem</p> <p>Use exponents, including exponents in fractions and formulas</p>

# Career Ready Electronic Technician – Level 5\*

## Requirements

- ▼ Familiarity with PC and Server Operating Systems
- ▼ Understanding of networking principles.
- ▼ Understanding of network protocols and standards.
- ▼ Ability to troubleshoot network issues.
- ▼ Excellent communication skills.
- ▼ Experience with network hardware and software.
- ▼ Experience with Lexmark printers.
- ▼ Experience with Toledo and Honeywell systems.
- ▼ Experience with Nortel BCM and Toshiba systems.
- ▼ Experience with Fujitsu Self Checkout systems.
- ▼ Experience with Cisco routers and HP network switches.

## Skills

- ▼ Tech Skills
- ▼ Tech Skills
- ▼ WBL
- ▼ Soft Skills
- ▼ Soft Skills
- ▼ Soft Skills
- ▼ Soft Skills

**\*Most ads call for  
2-years of ed/training &  
experience**

# What Occupational Skills!!!!

↓ (AKA Employability Skills)

Occupational Skills & Knowledge

↓ Frameworks: SCANS, 21<sup>st</sup> Century Skills

- ↓ \*Critical thinking
- ↓ \*Teamwork/ collaboration
- ↓ \*Problem solving
- ↓ \*Creativity
- ↓ \*Technology-information application
- ↓ Oral & written communication skills
- ↓ Responsibility
- ↓ Professionalism
- ↓ Ethics
- ↓ Systems knowledge

# Skills for the 21<sup>st</sup> Century



## The four "C"s

- Critical thinking and problem solving
- Communication
- Collaboration
- Creativity and innovation

As the three "R"s serve as an umbrella for other subjects, the four "C"s do for other skills.

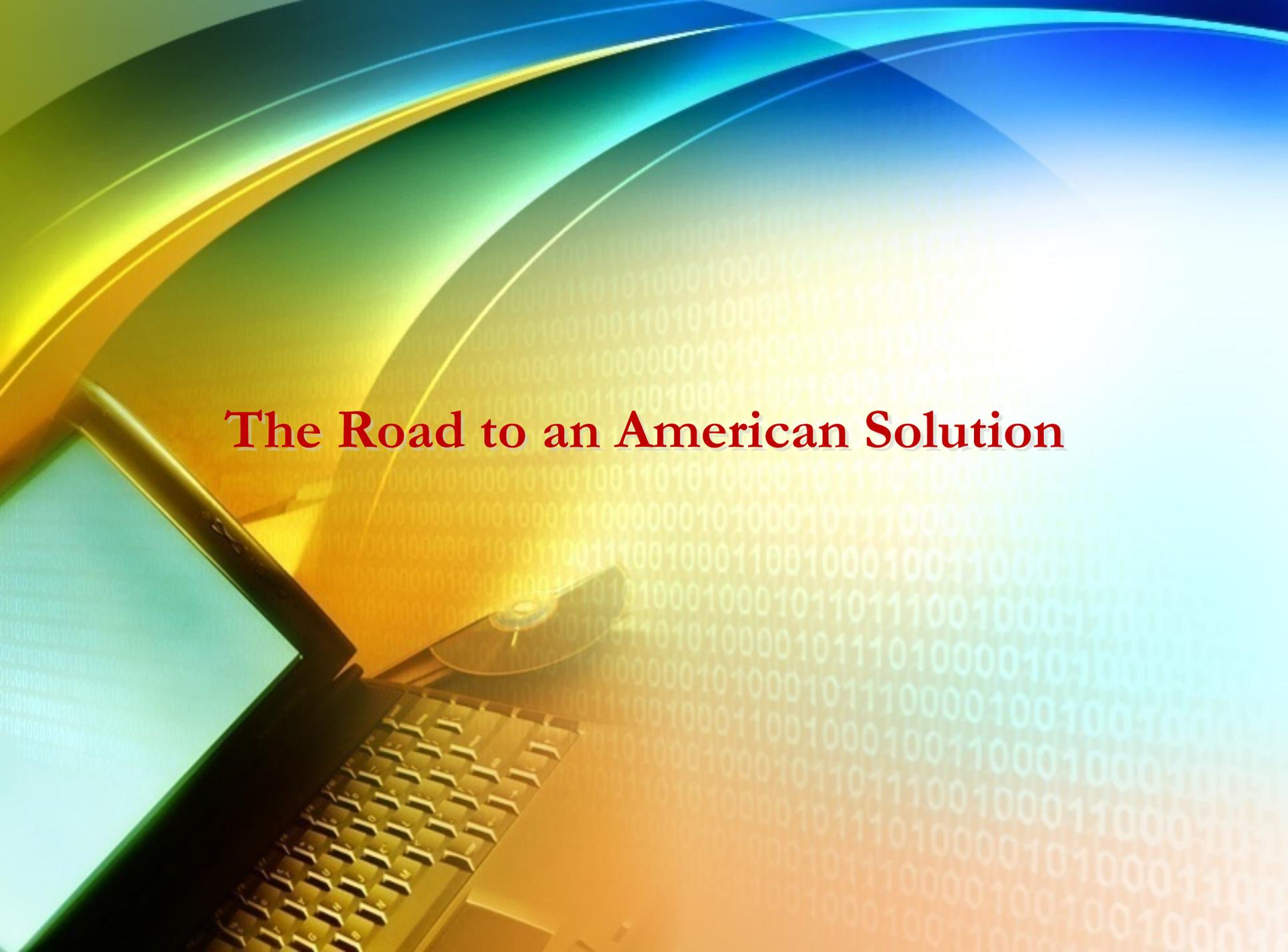


# What technical skills

**Technical**  
Knowledge & Skills

- ▾ Immediate specific job skills\*
- ▾ Industry certifications
- ▾ 132 available through HS programs (n=4 states)

\* Learning for jobs (OECD)

The background features a laptop in the lower-left corner, with its screen and keyboard visible. The entire scene is overlaid with a grid of binary code (0s and 1s) in a light blue color. Two large, glowing arcs, one yellow and one blue, sweep across the top of the image, creating a sense of motion and digital energy.

# **The Road to an American Solution**

# Elements of the Pathways System

## Core

1. Multiple Pathways
2. An Expanded Role for Employers
3. A new Social Compact with Young People

## Key Elements:

- ▾ Elevate career education to world-class levels
- ▾ Provide high-quality career counseling
- ▾ Greatly expand and improve opportunities for work-based learning

# Programs of Study (USDE)

- Incorporates secondary education and postsecondary education elements;
- Includes coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, non-duplicative progression of courses that align secondary to postsecondary education;
- Leads to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree; and
- May include opportunity for secondary education students to gain postsecondary education credits through dual or concurrent enrollment programs or other means.

# STRATEGIES

## Systems

- ▾ CAREER PATHWAYS
- ▾ CAREER ACADEMIES
- ▾ CAREER THEMED HIGH SCHOOLS

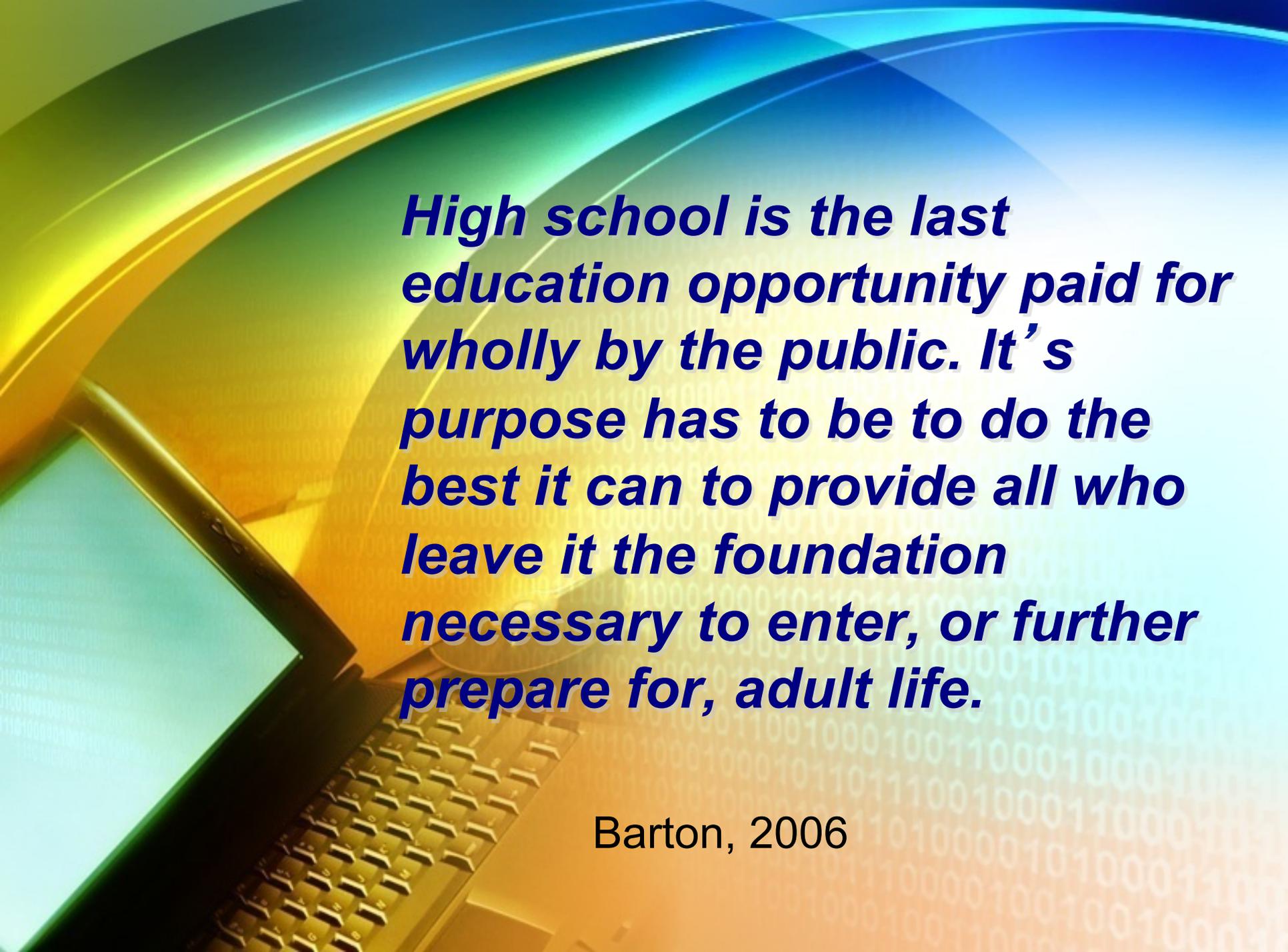
## Pedagogy

- ▾ CURRICULUM INTEGRATION
- ▾ WORK BASED LEARNING
- ▾ CAREER-TECHNICAL STUDENT ORGANIZATIONS (CTSO)
- ▾ CAREER GUIDANCE

# What we know

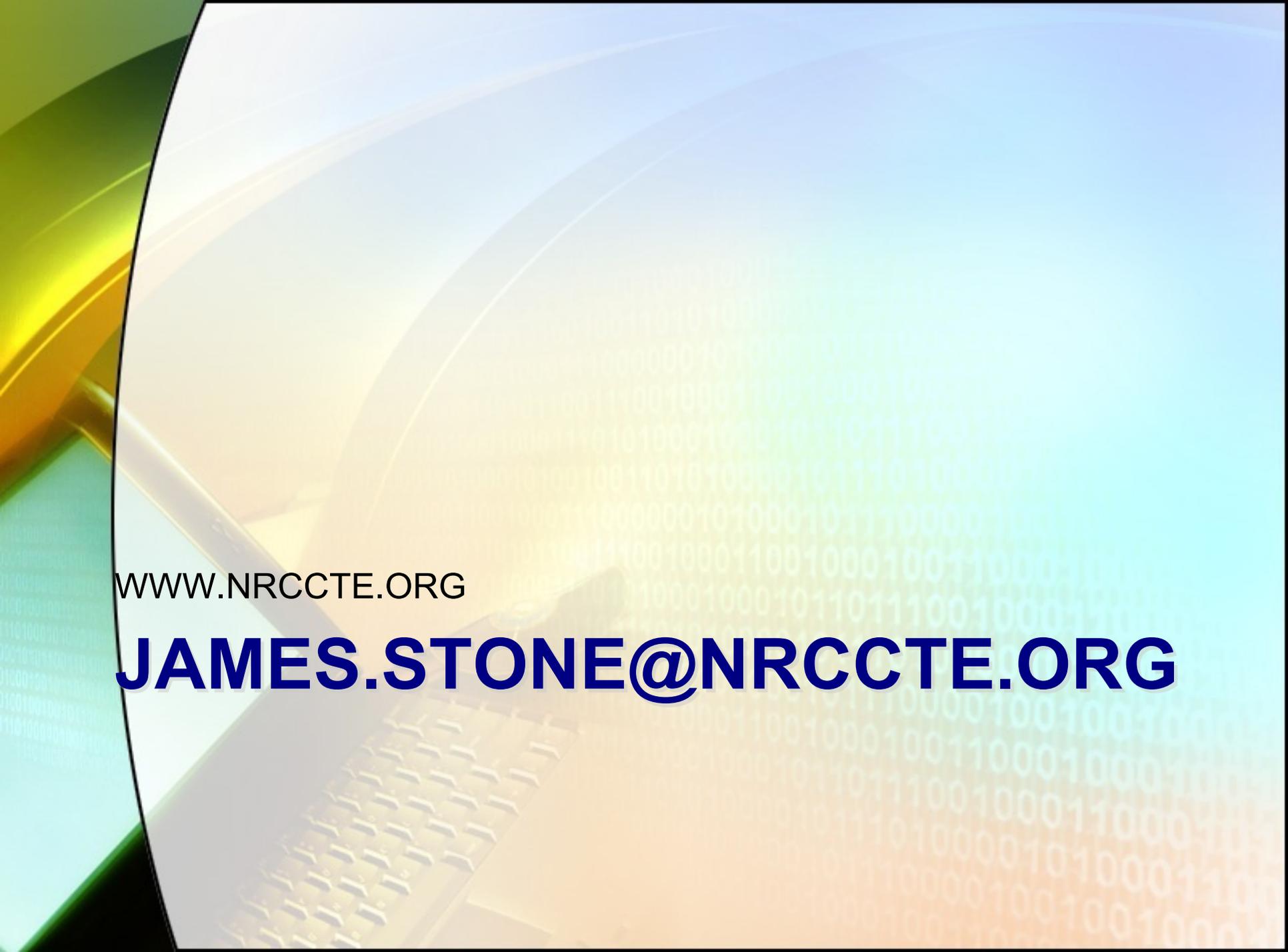
- Vocational education & training has been neglected\*
- Public investment in initial VET can deliver good economic returns\*
- Strong VET programs can **increase competitiveness**\*
- Integrated curriculum builds academic skills\*\*
- CTE engages students and reduces drop out rates\*\*

- \*Learning for jobs OECD 2010
- \*\*NRCCTE, 2006



***High school is the last education opportunity paid for wholly by the public. It's purpose has to be to do the best it can to provide all who leave it the foundation necessary to enter, or further prepare for, adult life.***

Barton, 2006

The background features a soft gradient from light blue to yellow, overlaid with faint, semi-transparent binary code (0s and 1s). In the lower-left corner, a portion of a laptop keyboard is visible, rendered in a light, semi-transparent style.

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