What do we mean

College AND Career Ready?

James R Stone III
Director
Many Perspectives . . .
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)
No support … that those not going to college need to be qualified to enter college credit courses in order to enter the workforce.

Becoming qualified for college-level classes or for entering a job directly out of high school is not the sole purpose of a high school education, e.g. preparing citizens to participate in a democracy.

Barton, P (ETS, 2006)
Agenda

• What is college and career ready?
• What is “work ready?”
• How do you ensure work/career readiness?
• How do you assess readiness?
# The College & Career Dilemma

<table>
<thead>
<tr>
<th>9th Grade Cohort</th>
<th>Benchmarks</th>
<th>Workforce Credentials</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 enter 9th grade*</td>
<td>75% complete HS&lt;sup&gt;1&lt;/sup&gt;</td>
<td>25% enter as HS drop outs</td>
</tr>
<tr>
<td>75 complete HS</td>
<td>70% start college immediately&lt;sup&gt;2&lt;/sup&gt;</td>
<td>23% enter as HS grad</td>
</tr>
<tr>
<td>52 Start college</td>
<td>47% drop out (31% with 0 credits)</td>
<td>24% enter with some college &amp; a lot of debt</td>
</tr>
<tr>
<td></td>
<td>57% complete within 6 years&lt;sup&gt;3&lt;/sup&gt;</td>
<td>28% enter with college degree (6/4;3/2)</td>
</tr>
</tbody>
</table>

1. Greene et al, 2006
3. NCES, 2010

*An unknown number of pre-9th graders never make it to high school.
College for all? Only 40% of 27-year olds have earned an A.A. degree or higher

What about the 60%? What about career development for the 40% college completers?

Note: Represents data collected in surveys between 2006-2008; GED is approximation based on data from GED Testing Program.
Teens and Young Adults have been hit the hardest by the Great Recession


54.3% of 18- to 24-year-olds (54.3%) were employed in 2011, compared with 62.4% in 2007, a 13% decrease. The lowest employment-to-population ratio for young adults since 1948.

Pew Research Center, 2012. *Coming of Age, Slowly, in a Tough Economy*
CONSIDER WHAT IS REQUIRED FOR THE WORKPLACE OF TOMORROW: WHAT TO TEACH
Education and Future Work:

BLS & CEW

- BS/BA or more: 23 (USDOL-BLS), 33 (CEW)
- Some College: 30 (USDOL-BLS), 33 (CEW)
- Associate: 5 (USDOL-BLS), 6 (CEW)
- PS Award: 6 (USDOL-BLS), 8 (CEW)
- Work Experience: 8 (USDOL-BLS), 58.5 (CEW)
- OJT-Short to Long: 36 (CEW)
- HS or less: 36 (CEW)
ONE REALITY: JOB GROWTH BY EDUCATION

- Less than HS: 10%
- High School: 11%
- Some PS: 22%
- Associate Degree: 19%
- Baccalaureate: 14%
- Masters or higher: 24%
Getting students ready for careers and college: Their future

Academic
- Mathematics
- Science
- Communications

Technical
- Job specific skills valued by employers

Occupational
- Employability
- Non-cognitive

College & Career Ready

Required skills
To be college ready: What college, what skills?

- Trade/Technical School?
- Apprenticeship?
- Community College?
  - Certificate? Diploma? Degree-Selective or not?
  - Nursing
  - Allied health
  - Law enforcement
  - Engineering technology
  - Computer technology
  - Cut scores?

- Baccalaureate College?
  - MN College Readiness Benchmarks set by ACT: an 18 in English, 22 in Math, 21 in Reading, and 24 in Science.
  - Only 32% of Minnesota’s 2009 ACT-tested graduates met all four
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
Electronic Technician – Level 5*

Requirements

Fundamental knowledge of PC and Server Operating Systems.

Fundamental knowledge of networking principles.

Strong Electronics and Mechanical background

Highly motivated and energetic

Strong communication skills and work ethic

Strong organizational skills

Working knowledge of Microsoft Office applications

Excellent troubleshooting skills

Experience with IBM POS equipment

Experience with Lexmark printers

Experience with Toledo and Hobart scale systems

Experience with Nortel BCM and Toshiba CTX systems

Experience with Fujitsu Self Checkout systems

Experience with Cisco routers and HP network switches

*Most ads call for 2-years of ed/training & experience
<table>
<thead>
<tr>
<th>ACT Score</th>
<th>Level</th>
<th>ACT Standard-Associated Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-15</td>
<td>Alg I / CC HS</td>
<td>Simplify ratios</td>
</tr>
<tr>
<td>16-19</td>
<td>Alg I / CC 8th</td>
<td>Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Use rational numbers to demonstrate knowledge of additive and multiplicative inverses</td>
</tr>
<tr>
<td>20-23</td>
<td>Alg I / CC 8th</td>
<td>Set up and solve problems following the correct order of operations (including proportions, percent, and absolute value) with rational numbers (integers, fractions, decimals)</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC 8th</td>
<td>Give the domain and range of relations and functions</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC 8th</td>
<td>Evaluate functions at given values</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Apply algebraic properties (e.g., commutative, associative, distributive, identity, inverse, substitution) to simplify algebraic expressions</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Translate real-world problems into expressions using variables to represent values</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Identify the effect on mean, median, mode, and range when a set of data is changed</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Find the probability of a simple event</td>
</tr>
<tr>
<td></td>
<td>Geo / CC 8th</td>
<td>Identify corresponding, same-side interior, same-side exterior, alternate interior, and alternate exterior angle pairs formed by a pair of parallel lines and a transversal and use these special angle pairs to solve problems (e.g., solve equations, use in proofs)</td>
</tr>
<tr>
<td>Course/ Common Core</td>
<td>ACT Topic</td>
<td>ACT Score</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators</td>
<td>(16-19)</td>
</tr>
<tr>
<td>Alg I CC 8th HS</td>
<td>Use properties of exponents (including zero and negative exponents) to evaluate and simplify expressions</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Find rational number square roots (without calculators) and approximate irrational square roots (with and without calculators)</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Evaluate and simplify radical expressions</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Use scientific notation when working with very large or very small quantities</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Set up and solve problems following the correct order of operations (including proportions, percent, and absolute value) with rational numbers (integers, fractions, decimals)</td>
<td>(20-23)</td>
</tr>
<tr>
<td>Alg 8th</td>
<td>Identify, formulate, and obtain solutions to problems involving direct and inverse variation</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th I CC</td>
<td>Translate between different representations of relations and functions: graphs, equations, sets of ordered pairs, verbal descriptions, and tables</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Interpret data from line, bar, and circle graphs, histograms, scatterplots, box-and-whisker plots, stem-and-leaf plots, and frequency tables to draw inferences and make predictions</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Alg I CC HS</td>
<td>Simplify ratios</td>
<td>(13-15)</td>
</tr>
<tr>
<td>Alg I CC HS</td>
<td>Solve formulas for a specified variable</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real-world problems</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Use cross sections of prisms, cylinders, pyramids, and cones to solve volume problems</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Find the lateral area, surface area, and volume of prisms, cylinders, cones, and pyramids in mathematical and real-world settings</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Find the surface area and volume of a sphere in mathematical and real-world settings</td>
<td>(28-32)</td>
</tr>
</tbody>
</table>
## Career Ready Math Skills: Getting the job*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Algebra I</strong></td>
<td>- Telecommunication Junior Technician</td>
</tr>
<tr>
<td></td>
<td>- Nursing</td>
</tr>
<tr>
<td></td>
<td>- HVAC</td>
</tr>
<tr>
<td></td>
<td>- Survey Technician</td>
</tr>
<tr>
<td></td>
<td>- Plumbing</td>
</tr>
<tr>
<td></td>
<td>- Automobile Technician</td>
</tr>
<tr>
<td><strong>Geometry</strong></td>
<td>- Survey Technician</td>
</tr>
<tr>
<td></td>
<td>- Plumbing</td>
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<td></td>
<td>- Automobile Technician</td>
</tr>
<tr>
<td></td>
<td>- Nursing</td>
</tr>
<tr>
<td></td>
<td>- HVAC</td>
</tr>
<tr>
<td><strong>Algebra II</strong></td>
<td>- Telecommunication Junior Technician</td>
</tr>
</tbody>
</table>

*Preliminary analysis, NRCCTE 2012
Achievement Flat or Declining in Reading, 17 year olds, NAEP

Only 35% of 12th graders are proficient in reading. (38% proficient in 2009)

NAEP Science Scores – High School

New Framework in 2009 No Trend available:
60% Basic; 21% proficient

1.5 Credits

3.2 Credits

New Scale

150

147*
HS Achievement In Math


Note: Long-Term Trends NAEP
Occupational Skills

Non-Cognitive
- Deal with setbacks
- Stay on track
- Consistency
- Easily distracted
- Hard worker
- Persistence
- ‘Stick-to-it tiveness’
- Diligence
- Duckworth, 2011 “Grit”

Employability
- Teamwork
- Oral & written skills
- Professionalism
- Ethics
- Creativity
- Problem solving
- Ethics
- Systems knowledge
- Responsibility
- SCANS, 21st Century
What technical skills?

- Immediate specific job skills*
- Industry certifications
- 132 available through HS programs (n=14 states)

* Learning for jobs (OECD)
An Industry Perspective on AOT Skills

Toyota

Next Generation Skilled Team Member

- **Totally Multiskilled**
  - (Electrical/Fluid Power/Mechanical/Fabrication)
- **Strong Math Skill**
  - (Upper 1/3 nationally)
- **Strong Reading Skill**
  - (12th Grade level)
- **Fast Technical Learner**
  - (Can learn, apply, improve, and learn again)
- **Uses and Learns With Digital Media**
- **Strong Problem Solver**
- **Effective Verbal & Written Communicator**
  - (Comfortable in group and 1:1 situations)
  - (Develops high quality process manuals, guides)
- **Effective Interpersonal Skills**
- **Natural Teamworker**
- **Qualified for the Next Level**

**Target:**

100% of Maintenance Workforce
CONSIDER WHAT IS REQUIRED FOR THE WORKPLACE OF TOMORROW: HOW TO TEACH CAREER READINESS
For Career and College Readiness

FOCUS ON CURRICULUM
Curriculum is Derived from Industry AND Academic Standards: A Signature Feature
Industry Certification

- Developed by and used for a specific industry

- Various industries have designated standards for certificates, certifications and licensures

- Certificates may allow individuals to enter directly into the workforce

- Recognized as a measure of technical skill attainment for senior preparatory students in career and technical education as a part of Perkins accountability

Source: 705 KAR 4:231, Section 11; Industry-Recognized Certificate Programs and Job Corps: Working Toward a Skilled and Qualified Workforce published by MTC Institute
Linking to Industry Standards*

- Construction Technology
- Engineering Technology
- Digital Design
- NCCER – Carpentry Level 1
- NOCTI Pre-Engineering Tech; Certified
- SolidWorks Assoc.
- Adobe Certified Associate
- ASE Brakes, Electrical, Engine Performance

*Florida
What is a stackable credential?

Part of a sequence of credentials that can be accumulated over time to build up an individual’s qualifications and help them to move along a career pathway or up a career ladder to different and potentially higher-paying jobs.

Career Pathway – Stackable Credentials

A recent McKinsey Global Institute study concludes, “policymakers and business leaders across the globe will need to find ways to vastly improve their capacity to provide job-relevant education and training. And, in both developing and advanced economies, new approaches to job creation for low and middle-skill workers will be required (Dobbs, et al, 2012)

- More than course credit pathways
- Portable: trusted by employers and institutions of higher education (external validation)
- Stackable: each credential has value (labor market signal) leads to another credential:
  - 51% of CC certificates require less than one year
  - Offer accelerated entry into the labor market
  - Credentialing process can begin in upper secondary education
- Part of a career pathway system
Ohio Stackable Certificates for Health Care

High School

Community College

RN
LPN
Patient Care Tech
STNA
STNA Prep
Ohio Stackable Certificates for Welding Technology

- AAS Welding Technology
- Advanced Welding Certificate
- Welding Tech Certificate
- Precision Cutting Certificate
- Welding Prep
Pedagogic Tools for World Class CTE

- Classroom instruction
- Work based learning-WBL
- CTSOs
- Project based learning
- Contextualized learning
- Labs
- Shops
- Job shadowing
- Internships
- School-based enterprise
- Cooperative education
- Apprenticeships
- Leadership development
- Professional development
- Service/social engagement
- Competitive events
Curriculum Integration
Experimental Research

(Instructional)
Math-in-CTE: complete
Technical Assistance – 7 yrs

Literacy-in-CTE: complete
Technical Assistance – 2 yrs

Science-in-CTE:
Study recently concluded
Experimental design

Random Assignment (classroom level)
Pretest and posttest using established tests
Fidelity of treatment
Monitoring of counterfactual group(s)
Math-in-CTE - A study to test the possibility that enhancing the embedded mathematics in Technical Education coursework will build skills in this critical academic area without reducing technical skill development.
Math-in-CTE - A study to test the possibility that enhancing the embedded mathematics in Technical Education coursework will build skills in this critical academic area without reducing technical skill development.
What We Learned:

Experimental Test of Math Integration

Students in the experimental classes scored significantly higher on Terra Nova and Accuplacer

The effect: 71st percentile & 67th percentile

No negative effect on technical skills

11% of class time devoted to enhanced math lessons
Power of the New Professional Development Model

Math in CTE Use 1 Year Later

- Math teacher Partners
- Experimental CTE Teachers
- Control CTE Teachers

Total Surprise!

Old Model PD

New Model PD
Building Reading Literacy through CTE

A study to evaluate two reading interventions that CTE teachers can employ to improve reading skills of students in occupational programs.
## Authentic Literacy: What we tested

<table>
<thead>
<tr>
<th></th>
<th><strong>MAX</strong></th>
<th><strong>ASH</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Reading</strong></td>
<td><strong>Motivation</strong></td>
<td>Introduction and modeling of the skill</td>
</tr>
<tr>
<td></td>
<td>Reducing the anxiety and improving the probability of success in reading</td>
<td></td>
</tr>
<tr>
<td><strong>During Reading</strong></td>
<td><strong>Acquisition</strong></td>
<td>Guided practice in learning skill</td>
</tr>
<tr>
<td></td>
<td>Individual silent reading for personal interpretation</td>
<td></td>
</tr>
<tr>
<td><strong>After Reading</strong></td>
<td><strong>Extension</strong></td>
<td>Reflection on how the skill worked</td>
</tr>
<tr>
<td></td>
<td>Cooperative construction of meaning through discussion, writing, etc.</td>
<td></td>
</tr>
</tbody>
</table>
Significant improvement from both approaches

Teachers with two-years experience in method had greater effect

Experimental Test of Reading Interventions in CTE
Core academic skills that students need to succeed in a changing, globally competitive world include not just mastering core content but also performance skills such as:

- Ability to think critically and solve complex problems
- Work collaboratively
- Communicate effectively
- Learn how to learn (e.g., self-directed learning)

Academic content knowledge and these performance skills are inextricably linked—impossible to have one without the other (often referred to as “deeper learning”)

Common Core State Standards reflect this link
Core Principles

Begin with the CTE curricula, not with academics

Approach academics as essential workplace skills

Maximize the academics in CTE

Support CTE teachers as “teachers of academics-in-CTE”; not as academic teachers

Foster and sustain a Community of Practice
WHAT WE HAVE LEARNED

*How to Make Curriculum Integration Effective*
What quality CTE can do best: relevance
What we tested: Math Pedagogic Framework

1. Introduce the CTE lesson

2. The students whose teachers used the problem based curriculum in their classrooms scored significantly higher on measures of problem-solving skills (Institute Of Education Sciences, August 9, 2010)

Transfer of Learning
Begin with the CTE curricula, not with the academics
What is Curriculum Mapping?

- Genesis of the academic integration
  - You have to know where the academic opportunities are located to begin the process
  - Precedes integrated lesson development

- A “process” of investigating the CTE curriculum:
  - What do I teach and
  - Where do the academics naturally occur?

- An ongoing process (not a one-time only)
  - Growing with the process; Revisiting the maps
The Mapping Process…

• Create a “map” for the term or school year in the course/program selected
  • Use the mapping template

• Identify the CTE concepts worthy of academic enhancement.
  • Opportunities may outweigh the time available: Think about what will most help CTE students.
  • Maintain authenticity: Avoid “academics for the sake of academics”
<table>
<thead>
<tr>
<th>CTE UNIT/TOPIC</th>
<th>CTE CONCEPTS</th>
<th>MATH CONCEPTS</th>
<th>ACADEMIC STANDARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Structure and Function</td>
<td>Compare cell, tissue, organ and body systems relationships</td>
<td>Solve linear equations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Read and interpret graphs and charts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Problem solving involving statistical data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ratio and proportion</td>
<td></td>
</tr>
</tbody>
</table>

Only then do you “align” standards (e.g. CCSS)

Map the Math onto the CTE
A career ready person is proficient in the core academic subjects, as well as in technical topics. This foundational knowledge base includes competence in a broad range of academic subjects grounded in rigorous internationally benchmarked state standards... Career Readiness Council 2012

**Math-in-CTE Curriculum Map: Health Science**

<table>
<thead>
<tr>
<th>CTE Course/Unit</th>
<th>CTE Concepts</th>
<th>Math Concepts</th>
<th>Common Core Math Standards Middle School</th>
<th>Common Core Math Standards High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient assessment</td>
<td>Input/output; Vital signs; Height/weight; Conversions; Instrument reading</td>
<td>Reading measurement; Basic operations; Ratio/Proportion; Solving equations; Scales</td>
<td>6.NS.2; 6.NS.3; 7.NS.1; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.2; 7.EE.3</td>
<td>A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; A.CED.4</td>
</tr>
</tbody>
</table>

[http://www.nrccte.org/professional-development/math-cte/curriculum-maps](http://www.nrccte.org/professional-development/math-cte/curriculum-maps)
Creating opportunities for students to apply academic knowledge:

- generate examples and lessons in which students solve *authentic workplace problems*

- introduce and reinforce academic skills as “tools” needed in the “real world”

- *bridge CTE and academic vocabulary* in developing and teaching integrated lessons
Maximize the academics in CTE

Approach Academics as a Workplace Skill
A Process and
A Pedagogy

“More than a set of lesson plans…”

a *continuous process*…

…using pedagogic frameworks through which to enhance and teach the *embedded* academics
Support CTE teachers as “teachers of academics-in-CTE”; not as academic teachers
OTHER LESSONS

- Maintaining the CTE in integration
- Not a replacement of CTE curriculum
- Rather, an enhancement of existing curricula
- Do-able for CTE teachers
- The tipping point
- Maintaining authenticity
Foster and sustain a Community of Practice
Embed Career Development: A Signature Feature (AAI)
For Career and College Readiness

FOCUS ON PEDAGOGY
Effective CTE Teachers are skilled: A Signature Feature
Curriculum is Delivered Through Multiple Pedagogies: A Signature Feature

- Classroom instruction
- Work based learning-WBL
- CTSOs
- Project based learning
- Contextualized learning
- Labs
- Shops
- Job shadowing
- Internships
- School-based enterprise
- Cooperative education
- Apprenticeships
- Leadership development
- Professional development
- Service/social engagement
- Competitive events
Engaging Students through Work-Based Learning

Adding value to the high school experience
Everywhere but in the U.S. . . .

The % of youth in VET ranges from 5% (Ireland) to 80% (Czech Republic).

More than 50% youth in VET: Austria, Belgium, Finland, Switzerland, Australia, Germany, Sweden, Denmark and others.

Japan, United Kingdom, France, Korea and others exceed 20%

The U.S. doesn’t make the list!

*Learning for jobs* (OECD, 2010)
The Value of WBL

Nations enrolling a *large proportion of upper-secondary students in vocational programs that include heavy does of WBL* have significantly higher:

- school attendance rates
- higher upper-secondary completion rates
- college attendance

Bishop & Mane, 2004
Work-Based Learning

Studies have found increases in academic achievement as measured by standardized tests (Bailey & Merritt, 1997; Phelps, 1998; Steinberg, 1998).
Effect of Availability of Career-Tech in Secondary School on Upper-Secondary Graduation Rates

The Potential Power of CTE

Share of Upper-Secondary Students in Career-Tech Programs
source OECD *Education at a Glance*
CTE-WBL and Achievement

No WBL; 2.99 college GPA

No community service; 3.02 college GPA

58% with NO HS WBL; college GPA above 3.0

HS WBL; 3.08 college GPA

Community service; 3.11 college GPA

64% of with HS WBL; college GPA above 3.0

## Workbased Learning Approaches

<table>
<thead>
<tr>
<th>WBL Approach</th>
<th>Potential Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs</td>
<td>All aspects of an industry-curriculum integration</td>
</tr>
<tr>
<td>Shops</td>
<td>Relevance of academics</td>
</tr>
<tr>
<td>Job shadowing</td>
<td>SCANS/21(^{st}) Century Skills</td>
</tr>
<tr>
<td>Internships</td>
<td>Skills leading to industry certifications</td>
</tr>
<tr>
<td>School-based enterprise</td>
<td>Career development</td>
</tr>
<tr>
<td>Cooperative education</td>
<td></td>
</tr>
<tr>
<td>Apprenticeships</td>
<td></td>
</tr>
</tbody>
</table>

Service Learning

- Developmental
- Increasing intensity
- Linked to industry recognized credentials
WBL: Combining Work & Learning

- Job Shadowing
- Internship
- School-based Enterprise
- Co-op
- Apprenticeship

Class Based
Work Based
Engaging Students through CTSOs

Adding value to the high school experience
How CTSOs Work

Start a chapter
Commit to mission and goals of CTSO
Obtain administrative approval
Apply to state advisor
Recruit students
Communicate with parents
Prepare a constitution and bylaws

Manage a chapter
Initiate members
Elect/install officers
Develop a program of work
Raise funds
Manage finances

Gain publicity and recognition
Promote the chapter
Recognize members
Recognize supporters

Leadership Experience
Group/teamwork skills.
Public speaking
Parliamentary procedure

Professional Development
Expand learning opportunities
Apply knowledge and skills

Competition
Preparations
Transportation and housing
Supervision at the site

Community Service
Identify local needs
Respond to needs

Teacher Provision and Facilitation of Experiences and Opportunities for Students

Outcomes
Motiv  Acad Eng  Civic Eng  Grades  Career SE  Coll Asp  Empl


- Prof Devel
- Competition
- Community Serv
The CTSO: Building Occupational Skills

Function
- Competitive Events
- Leadership Development
- Professional Development
- Social Engagement

Effect
- Academic Engagement
- College Aspirations
- Grades
- Career Efficacy
- Employment Aspirations
- No Effect
- (-)Career Aspirations
- Employment Aspirations
- Career Efficacy

CTSOs: Early Findings (Alfeld, et al, 2007)
For **Career** and College Readiness

FOCUS ON ASSESSMENT
KDE College and Career Ready Model 2011-12

KDE College Ready, Career Ready, and Career AND Career Bonus

KDE Career Ready: Must meet benchmarks for one requirement in Career Academic area and must meet one requirement in Career Technical area.

College Ready: Must meet benchmarks on one of following:

- ACT
- COMPASS
- KYOTE

Career Ready Academic

- Armed Services Vocational Aptitude Battery (ASVAB)
- ACT Work Keys (Applied Math, Locating Information, and Reading for Information)

Career Ready Technical

- KOSSA
- Industry Certificates

Notes: (1) By meeting the college ready academic definition, the student does not have to take the additional tests of ASVAB or Work Keys for the bonus area. (2) For accountability purposes scores are capped at 100.

Bonus - College AND Career Ready: Must meet at least one from each area.

College Ready Academic

- ACT or COMPASS or KYOTE

Career Ready Technical

- KOSSA
- Industry Certificates
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