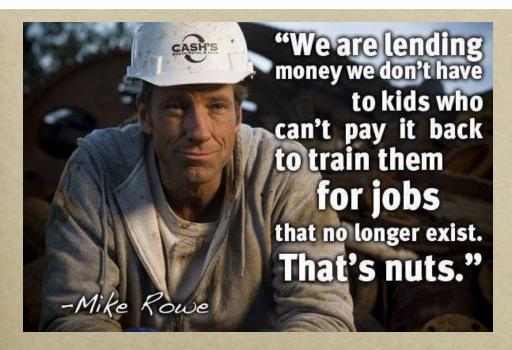
Welcome! Industry Expectations and Educational Practices





Industry Expectations and Educational Practices

CTE Bridging the Gap

The realities of "core competencies" in CTE coursework are a critical component of a career ready workforce

Neal Kauffman & Brian Gordon Three Rivers Education For Employment System



America today in Mike Rowe's view

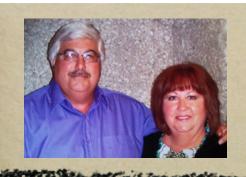
This is a 5 year old slide - Only one of the 3 Bullet Points is remotely close to true



PROFOUNDLY DISCONNECTED?

- * A trillion dollars in student loans.
- * Record high unemployment.
- * Three million good jobs that no one seems to want.

The goal of Profoundly Disconnected is to challenge the absurd belief that a four-year degree is the only path to success. The Skills Gap is here, and if we don't close it, it'll swallow us all. Which is a long way of saying, we could use your help...



Our Background



- Combined 40+ years of experience in business and industry
- Trainer and HR manager for Exelon, a fortune 200 company
- Small Business Owners
- Work with health care consulting firm Securities Licenses held
 quoted and/or referenced in the Wall Street Journal, New England Journal of Medicine Published In Diagnostic Imaging, MR, and the MR Focus
- Adjunct Community College Faculty
- Adjunct Graduate School Faculty
- Combined 30+ years in K-12 education

Profoundly disconnected....

 Neal and I are passionate about bridging the gap in order for our schools to graduate students that are truly career ready. The myth that "college ready" and "career ready" are the same thing needs to go away.

We work closely with business and industry because "you don't know what you don't know"















George E. Booth Co., Inc.





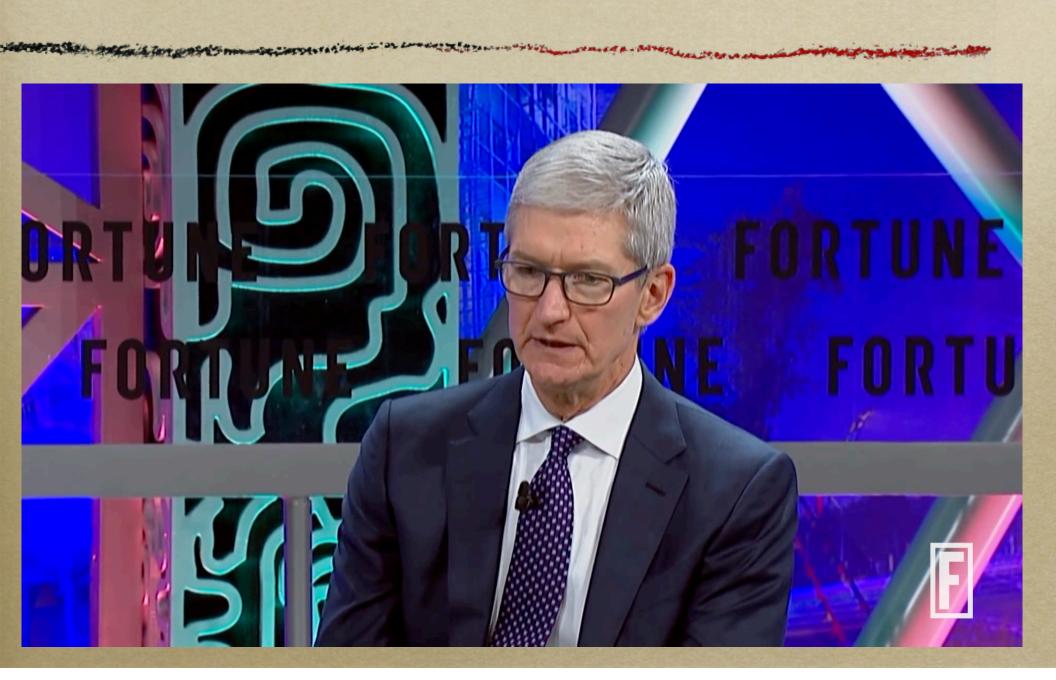








Who is this man?



Did you hear that?

- The "V" word. Business and Industry realities.
- Our educational system is a critical component of our nation's economic engine. Are the policies in our country and respective states recognizing that fact?

The TREES Math Pilot

- 50 question test devised of the identified areas of frequent remediation
- Retired or sample questions from ACT, SAT, TABE (The Adult Basic Education Exam), TASC (Test Assessing Secondary Completion)

Math skills needing frequent remediation...

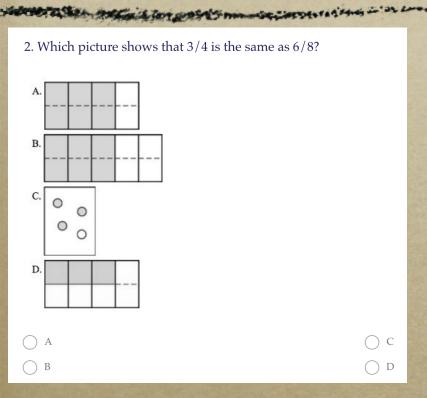
Question: What are the mathematics concepts you regularly remediate in your CTE course?

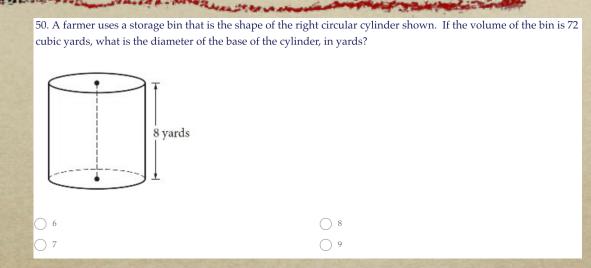
- 1. Fractions
- 2. Conversions (fractions to decimals to percent to ratio)
- 3. Time and calendar (projecting a 2-month budget—students unsure what date is 60 days from April 1)
- 4. Mental math (ability to A, S, M, D simple whole numbers; especially multiplication tables; especially addition and division of fractions)
- 5. Equivalents and associated abbreviations (cups to pints, pints to quarts, quarts to gallons; teaspoons to tablespoons, tablespoons in 1 cup, etc.; ounces to pounds; conversion of English to metric)
- 6. Measurement: weight and volume (e.g., 2 cups of butter in 1 pound: cut the pound brick into half-cup portions; liquid and dry measures; reading portion control scales, metric scales, etc.)
- 7. Vocabulary key terms:
- 8. Measurement: reading rulers and scales, reading tape measures, accuracy, precision, etc.; portion control techniques
- 9. Estimation (volume, weight, time, etc.)
- 10. Formula use (selection of a formula for a specific situation; plugging numbers into a formula—may relate to understanding and sorting a complex problem; order of operations)
- 11. Calculator use (especially how to enter fractions, decimals, percent, etc.)
- 12. Number interpretation (e.g., What does a solution mean?)
- 13. Use of mathematics in complex situations (e.g., budgeting, mortgage, taxes, rent, travel, etc.

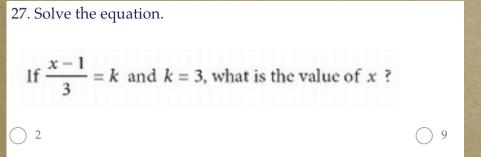
The Process

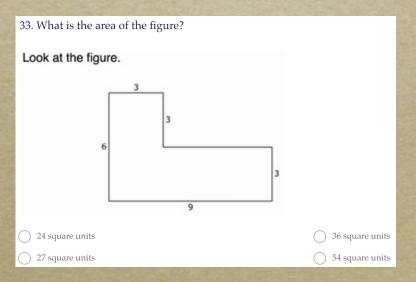
1	Concepts	Test Item Source	Difficulty (E/M/H)	Teacher Resources	Treatment Options
2	A. Fractions (Mark S./Colleen)	SAT #1 Question 1; SAT #1 Question 8; SAT #3B Question 4; SAT Student Guide Question 9 p30; TABE E Question 3; TABE E Question 6; TABE E Question 7; TABE D Question 2; TASC #11; NAEP #8; NAEP #81; NAEP #87; NAEP #130; NAEP #156; NAEP #172; NAEP #246; NAEP #255	Easy; Easy; Easy; Easy; Easy; Easy; Moderate; Easy; Hard	MYcaert LPs & CC Math Activities SAT Scoring Guides TABE Blueprint & Rationale Math Dictionary NRCCTE MCTE activities & LPs ACHIEVE test items Illustrative Mathematics.org Illinois Stats (IL Stats) at http://ilstats.weebly.com/high-school.html Teach Engineering.org;	Physics-Tech-like partnerships Review test items via SAT/TABE/NAEP practice tests, scoring guides, and blueprints Remediate concepts identified by pre- and post-testing results
3	B. Conversions & Ratio (Mark S./Jeff)	#1B Question 13; SAT #1B Question 23; SAT #2B Questions 4 and 5; SAT #5B Question 3; SAT #5B Question 16; SAT Student Guide Question 6 p28;	Moderate; Moderate; Moderate: Easy/Easy; Easy; Easy; Moderate; Moderate; Moderate; Easy; Easy; Moderate; Hard		
4	C. Time and calendar (Don/Katie)		Moderate/Moderate; Easy; Easy; Moderate; Moderate		
	D. Mental math/Numerical Reasoning (ASMD) (Mark D.)	Question 14; SAT #2B Question 31 & 32 (make MC and add distractors); SAT #2B Question 34 (make MC and add distractors); SAT #5B Question 16; SAT Student Guide Question 1 p26; SAT Student Guide Question 9 p30; TABE E	Easy; Easy; Easy; Easy; Easy; Moderate; Easy; Easy; Easy; Easy; Moderate; Moderate; Moderate; Easy; Moderate; Easy; Moderate; Easy; Easy; Moderate; Moderate; Easy; Easy; Hard; Hard		

A diverse range in difficulty









But none are over very complex in the grand scheme of things.

880 Students took the pre-test

Average Score was 57%



What did we prove?

- A large segment of our student population (future workforce) struggles mightily with fundamental mathematic skills for employment.
- o Our "System" needs fixing

Post-test - what will it show?

 We hope our CTE coursework will demonstrate improvement in the fundamental math skills needed due to the embedded math in the various CTE classes.

The most missed question

o 22% of students scored correctly on this

44. In the equation, b and c represent the price per pound, in dollars, of beef and chicken, respectively, x weeks after July 1 last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

$$b = 2.35 + 0.25x$$

$$c = 1.75 + 0.40x$$

\$2.60

\$2.95

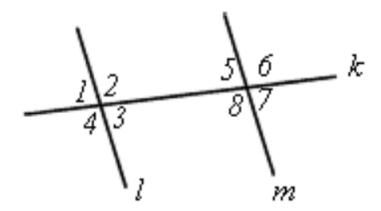
\$2.85

\$3.35

Anybody taken the Aleks Exam?

Suffice it to say, it looks a bit different

Lines l and m intersect line k. Assume angles 4 and 7 are supplementary.
 Then we can conclude that



- a. lines l and m are perpendicular.
- b. angle 8 and angle 1 are congruent.
- lines l and m are parallel.
- angles l and 2 are complementary.
- e. angles l and 5 are supplementary.

What do employers look for?

o Put simply and succinctly: Business and Industry Pay

for Skills and Production



ZEROHEDGE.COM

No College, No Problem: Silicon Valley's Student Loan Solution

If you want to make it in today's world, doors are opening up to those who...



BLOOMBERG.COM

U.S. Student Debt May Be a Crisis Now. Soon It Will Be a Catastrophe



CNBC.COM

The future of work won't be about college degrees, it will be about job skills

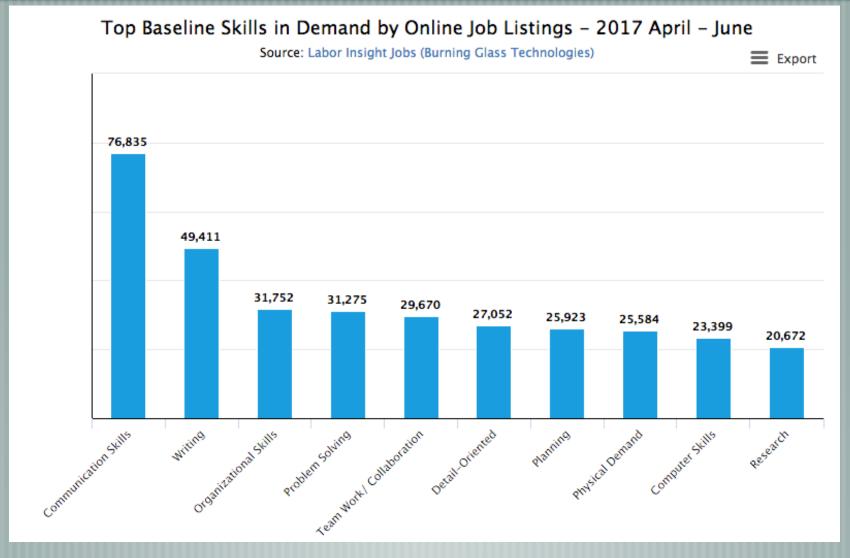
An excerpt...

Google, of course, is not alone. Glassdoor recently added 15 more companies to its list of employers willing to forego the college degree requirement for job applicants.

They include:

- Google
- Apple
- IBM
- Hilton
- Costco Wholesale
- Whole Foods
- Lowe's
- Penguin Random House
- Publix
- Starbucks
- Nordstrom
- Home Depot
- Bank of America
- Chipotle
- EY (UK)

Workforce Demands - Baseline Skills - Are you addressing these? How?



What are the most in-demand specialized skills?

Specialized Skills In Demand.....

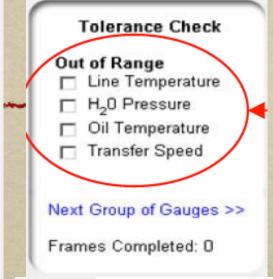


Another "Challenge"

Millennial Job Interview



Operations Practice Test Question from a Fortune 200 Company



Select the out of range gauges.

Tolerance Limits:K-12.MP.4 - Model with Math - Usually Associated with things Beyond College Ready Honestly you would be hard pressed to find a Math "Content" Standard which looks at this

Line Temperature: 25° to 35° H₂O Pressure: 20 PSI to 28 PSI

Oil Temperature: 75° to 100° Transfer Speed: 134.22 to 136.34

ELA CC.11-12.R.ST.7 (Reading in Science and Tech)

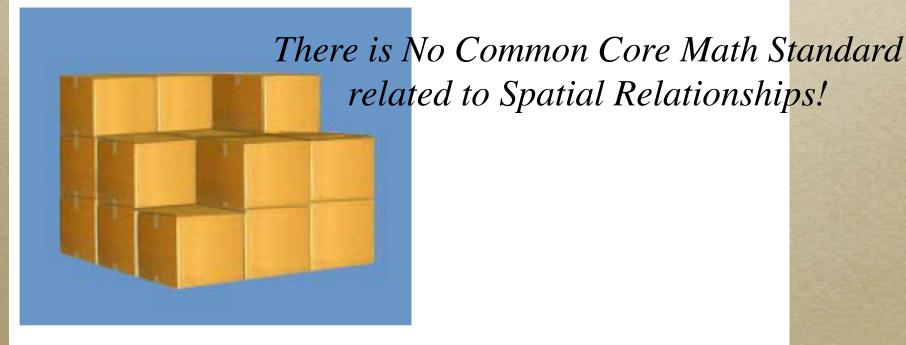
Compare the readings for each labeled gauge display. (Line Temperature, H_2O , Oil Temperature, Transfer Speed) to the tolerance limits provided.

Where, if anywhere, do we find this in our schools?

Logistics Exam Questions

Source - Fortune 200 Companies Logistical Practice Examination

5. The cubes in this illustration represent boxes in a warehouse. How many boxes are there?



A. 21

B. 22

C. 23

D. 24

It might be CC9-12.G.MG.3 or .1

It is definitely CC.K-12.MP.4

Use the Part List below to answer questions 6 - 8.

		Paper I	rices			
Group Type						
Weight	Α	В	C	D	E	
#20	0.11	0.12	0.13	0.14	0.15	
#24	0.13	0.14	0.15	0.16	0.17	
#28	0.15	0.17	0.19	0.21	0.22	
#32	0.18	0.20	0.22	- 0.24	0.26	
#38	0.21	0.23	0.25	0.27	0.29	
Group II	Туре					
Weight	Α	В	С	D	E	
#20	0.15	0.17	0.19	0.21	0.22	
#24	0.18	0.20	0.22	0.24	0.26	
#28	0.21	0.23	0.25	0.27	0.29	
#32	0.24	0.26	0.28	0.30	0.32	
#38	0.28	0.30	0.32	0.34	0.36	

Color Selection		
Group	Group II	
blue	cactus	
buff	crimson	
canary	diamond	
goldenrod	eggplant	
green	emerald	
grey	gold	
ivory	lemon	
orchid	lime	
pink	peach	
salmon	plum	
tan	pumice	
turquoise	ruby	
white	sandstone	

Grade Cate	egery
Grade	Code
Writing	Α
Offset	В
Opaque	C
Index/Tag	D
Cover	E

- 8. According to these reference tables, what is the price difference between Group II, offset and cover grade paper at # 20 weight?
 - A. 0.01
 - B. 0.03
 - C. 0.05
 - D. 0.07

Meanwhile, Back on The Education Front.....

How are our Math Teacher's doing with creating challenging test items in Bloom's Taxonomy?

You know, the type of questions that demonstrate skills for the workplace?

New Domain

Cr •Creating

Ev •Evaluating

An •Analyzing

Ap •Applying

Understanding

Remembering

Apparently, they need some help.

Teacher-Developed Tests

Cognitive Level of Questions

	R	U	<u> </u>	An	<u>Ev</u>	Cr
Elem	83%	0%	7%	10%	0%	0%
JHS	97%	0%	3%	3%	0%	0%
HS	88%	9%	0%	3%	0%	0%

SOURCE: Fleming and Chambers; 8,800 test items analyzed

New Domain

Cr •Creating

Ev • Evaluating

An •Analyzing

Ap •Applying

U •Understanding

R •Remembering

Operator Practice Exam

Source: Fortune 200 Company on-line exam prep

with the property of the second secon

Use the information given below to work problems 1 through 19. For each problem circle the letter in front of the correct answer. If none of the answers is correct, circle answer e, N (for none).

- 1 mile = 5,280 feet
- 1 kilogram = 1,000 grams
- 1 kilometer = 1,000 meters
- 1 kilogram = 2.205 pounds
- 1 hand = 10 centimeters
- 1 yard = 36 inches
- 1 centimeter = 0.394 inches
- 1 slug = 14.59 kilograms
- 1 acre = 160 square rods
- 1 mile/minute = 88 feet/second
- 1 acre = 43,560 square feet
- 1 fathom = 6 feet
- 1 furlong = 40 rods
- 1 hogshead = 63 gallons
- 1 acre = 10 square chains
- 1 gallon = 3.785 liters
- 1 gill = .25 pints
- 1 rod = .25 chains
- 1 pint = .5 quarts
- 1 pound = 16 ounces

- 3) 15 acres = ? square chains
 - a. 20
 - b. 114
 - c. 150
 - d. .25
 - e. N
- 4) 0.5 kilometers = ? meters
 - a. 300
 - b. 500
 - c. 120
 - d. 790
 - e. N
- 5) 87,120 square feet = ? acres
 - a. 1
 - b. 3
 - c. 36
 - d. 2
 - e. N
- 6) 2 kilograms = ? pounds
 - a. 5.36
 - b. 4.41
 - c. 2.12
 - d. 16
 - e. N

- 16) 0.5 slugs = ? grams
 - a. 8,700
 - b. 3,568
 - c. 7,295
 - d. 5,601
 - e. N
- 17) 3,000 grams = ? pounds
 - a. 6.615
 - b. 15.9
 - c. 5.61
 - d. 0.9
 - e. N
- 18) 64 quarts = ? gills
 - a. 128
 - b. 512
 - c. 255
 - d. 218
 - e. N
- 19) 16 quarts = ? pints
 - a. 25
 - b. 32
 - c. 18
 - d. 18.72
 - e. N

www.cteintrees.org





Three Rivers Education For Employment System

Education For Life...Works

Committees | Professional Development | Resources | Forms | Required Postings

Common Core Resources

Searchable ELA Standards



ELA common core standards-2.pdf

Searchable Math Standards



Math_common_core_standards.pdf

CC Career Technical Core



CCTCCareerTechnicalNov52012.pdf





A rich variety of resources



ISBE's CC Resource Page

Video Resources We Like

Click the Image to launch the video. Please contact TREES if link is "broken".



Mike Rowe testifies on the Energy Sector and the Skilled Trades on April 29, 2014.

Success In the New Economy -

Thought provoking and insightful - although I would use BLS workforce data.





Mike Rowe testifies - The Economy, Skilled Trades, and "Vocational" Education

Sir Ken Robinson -"Do Schools Kill Creativity?" **Absolutely Brilliant**



Other Resources

Mike Rowe's web site has a great info-graphic on the skills gap and a variety of other resources helpful to CTE. Please check it out.





This is the handout provided at legislative day in the Capitol. It has pertinent facts about the profound impact CTE has on education.

ACTEHandout.pdf



A great article from the Fabricator. Where the Best Welders Go and Why. This disspells a number of misconceptions regarding workforce and education needs.

Grant Wiggins has Updated his more relevant than ever "Abolish the Diploma" article. Click Grant's image to go there.





We just hosted our first NGSS in CTE workshop. You can find the Next Generation Science Standards by clicking the logo. There is a terrific natural tie in to CTE.

This handout was recently distributed in our PARCC Assessment Class. It is an example of Constructed Personne questions which

Contacting Us...

- Brian Gordon <u>brian.gordon@jjc.edu</u>
- Neal Kauffman nkauffma@jjc.edu
- o "TREES" 815-280-2990
- This presentation and many other resources available at:

cteintrees.org

Resources

- https://www.youtube.com/watch?v=vXwys7nRI_0
- https://www.youtube.com/watch?v=ZPbNav1KuXQ
 - · Nationalcareerreadiness.org
 - · Exeloncorp.com
 - Bennett Mechanical Comprehension Practice Test
 - Caterpillar Non-Management Selection Process
 - Pre-Apprentice Training (Jack Martin & Mary Serich)
 - Bureau of Labor Statistics Occupational Outlook Handbook
 - National Research Center for Career and Technical Education
 - Mike Rowe testimony http://www.youtube.com/watch?v=cC0JPs-rcF0
 - Central Illinois Manufacturing Association You tube clip http://www.youtube.com/watch?v=P9-iTAFlIVk
 - "Career Pathways for Stem Technicians" Dan Hull
 - "The Global Achievement Gap "

 Tony Wagner
 - Science and Engineering work force data http://www.computerworld.com/s/article/9224823/ Science and engineering workforce has stalled in U.S. report says
 - STEM skills listing http://www.iseek.org/careers/stemskills.html
 - "F In Exams" Richard Benson
 - Medical Assistant Practice Exam -http://www.proprofs.com/quiz-school/story.php?title=ncct-offical-practice-test-m
 - www.recipes.com, www.denverpost.com
 - www.julianbeever.net