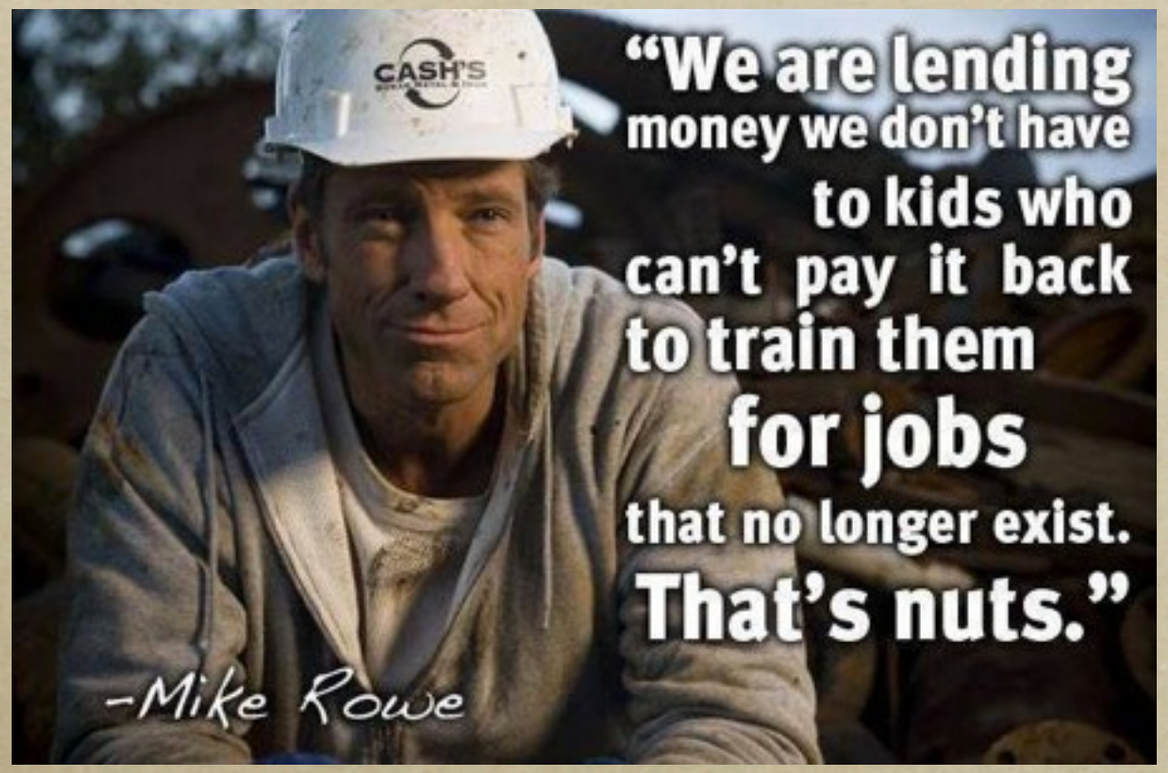

Can you make the cut?

What Our Students Really Need to Know

Sorting through the minutia and targeting the skills our employers actually need their workforce to possess

Neal Kauffman & Brian Gordon
Three Rivers Education For Employment System

America today in Mike Rowe's view

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*
- *Adjunct Community College Faculty*
- *Adjunct Graduate School Faculty*
- *Combined 30+ years in K-12 education*

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So What's the Problem? Why are we Profoundly Disconnected?

Eduspeak

Industry Language

So What's the Problem? Why are we Profoundly Disconnected?

Eduspeak

Industry Language

"STEM"

So What's the Problem? Why are we Profoundly Disconnected?

Eduspeak	*Industry Language*
"STEM"	*Technical Competencies*

So What's the Problem? Why are we Profoundly Disconnected?

Eduspeak

"STEM"

Contextual

Industry Language

Technical Competencies

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Soft Skills	

So What's the Problem? Why are we Profoundly Disconnected?

Eduspeak	*Industry Language*
"STEM"	*Technical Competencies*
Contextual	*Applied*
Soft Skills	*Don't be a Bonehead*

Eduspeak

Industry Language

Eduspeak

Industry Language

Employability Skills

Eduspeak

Industry Language

Employability Skills

Show up on time, fit for duty, and ready to learn, ready to work!

Eduspeak

Industry Language

Employability Skills

Show up on time, fit for duty, and ready to learn, ready to work!

Career Ready

Eduspeak

Industry Language

Employability Skills

Show up on time, fit for duty, and ready to learn, ready to work!

Career Ready

Value added, drive business to profitability

Eduspeak

Industry Language

Employability Skills

Show up on time, fit for duty, and ready to learn, ready to work!

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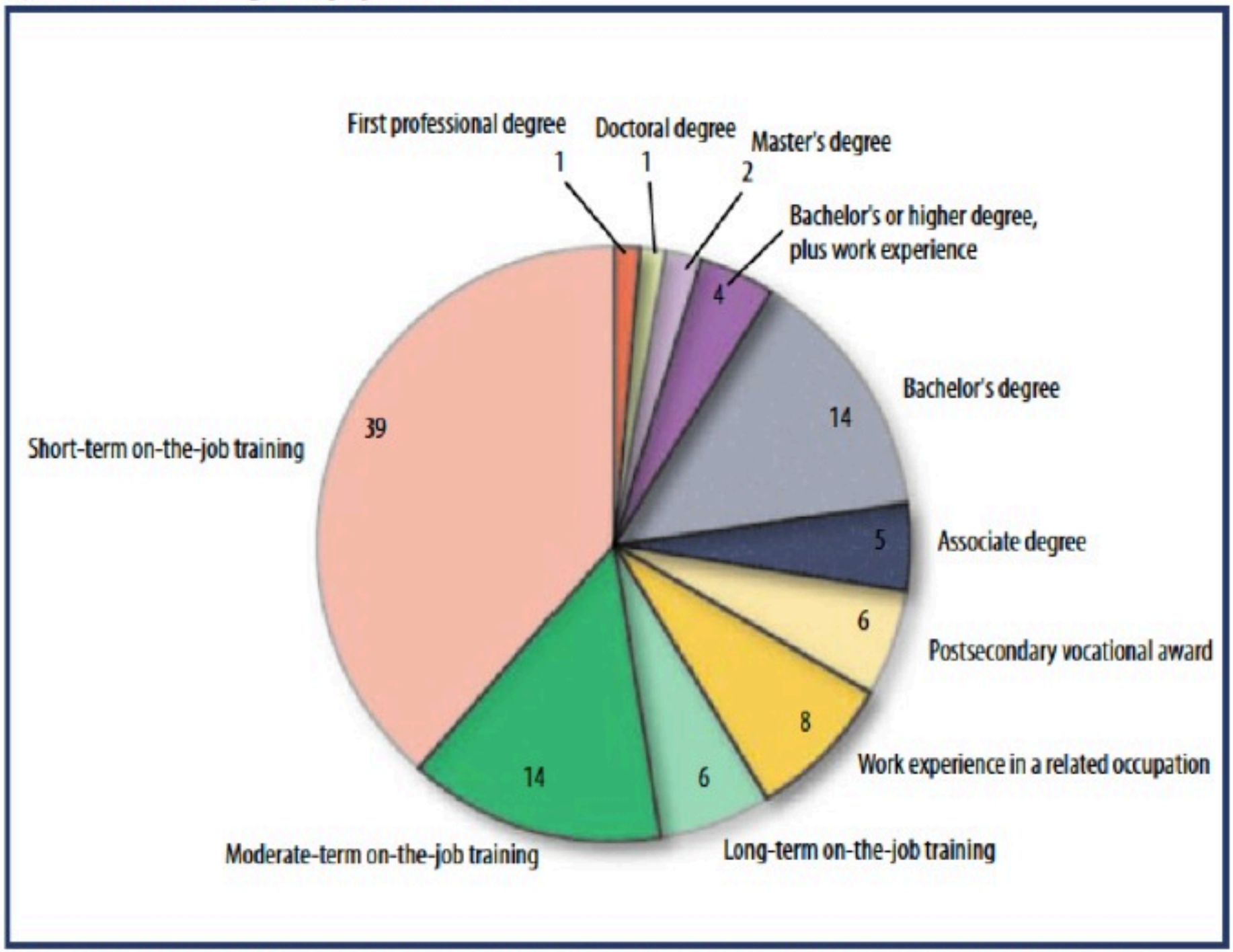
Value added, drive business to profitability

Employers expect their employees to make them money.

Percent distribution of job openings due to growth and replacement needs by education or training level, projected 2008–18



Most job openings over the projections decade will be in occupations that require short-term on-the-job training. Occupations requiring moderate-term on-the-job training and those requiring a bachelor's degree are also expected to have a large share of the projected job openings.

Source:
Occupational Outlook Quarterly
US. Department of Labor
U.S.Bureau of Labor Statistics
Winter 2009-2010

Perceptions and Realities are way out of balance

Only 22% of our graduates will need a bachelors degree or higher.

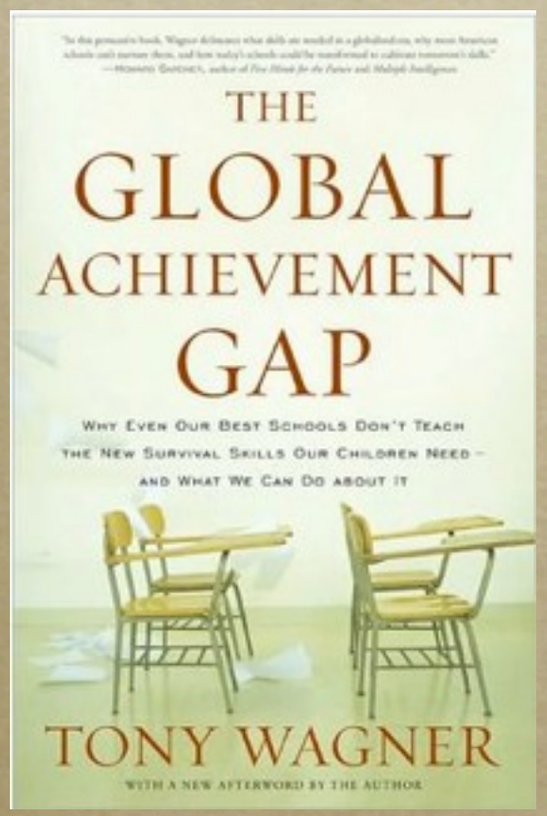
Additionally, 5% of high school graduates will need an Associates Degree.

Our Current Educational Policies are inconsistent with this data

If our goal is to send 100% of our students to college, we are not serving all of our students realistically

Data from a College Entrance Exam and sending 100% of our graduates to college should not be our measurement of school success

We're Currently STEM Crazy



"We can't teach them to think"

CTE Coursework Does!

Experiential training (learning) in a setting requires critical thinking and problem solving - The types of workers you need in TDL

Eduspeak vs. application in Industry

Educational "Overview"

(STEM)Trans-disciplinary approach to education (multi-faceted whole)

(STEM)New sphere of understanding that ensure the integration of disciplines

---

Industry Realities

Industry pays for SKILLS!

Industry is no longer willing to allocate funds to train workers from ground zero

Industry uses validated "aptitude exams" to ensure applicants have basic skill sets needed for industrial applications

Industry uses "behavior based interview questions" to ensure applicant has the necessary soft skills/technical skills for industrial applications

Industry assumes past behavior is representative of future behavior (behavior based??)

Industry Expectations for Employees : on time, fit for duty, ready to learn, value added, drive business to profitability

Let's Be Smart about STEM

One very notable benefit?

One very notable benefit?

- College Course Reimbursement

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Many industries will pay for you to go to school.

One very notable benefit?

- College Course Reimbursement

Many industries will pay for you to go to school.

Do our counselors tell students there are employers out there that will do this? Do our counselors know?

http://www.iseek.org/careers/stemskills.html

Employers want workers who are able to reason and solve problems using some math, science, or technology knowledge.

Key Employability skills include:

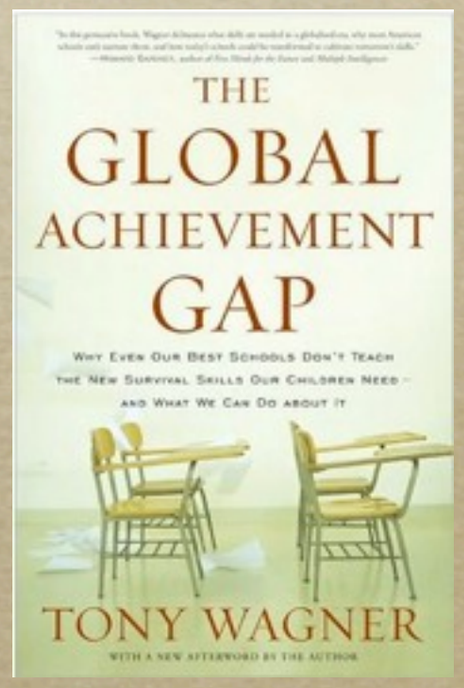
- Analytical skills to research a topic, develop a project plan and timeline, and draw conclusions from research results.

- Science skills to break down a complex scientific system into smaller parts, recognize cause and effect relationships, and defend opinions using facts.

- Mathematic skills for calculations and measurements.

- Attention to detail to follow a standard blueprint, record data accurately, or write instructions.

- Technical skills to troubleshoot the source of a problem, repair a machine or debug an operating system, and computer capabilities to stay current on appropriate software and equipment.



Boom Goes The Economy?!?

Sources: *ASSEMBLY*, Associated Press, Bloomberg, Business Wire, *Daily Journal of Commerce*, Greater Phoenix Economic Council, KPAX, McClatchy-Tribune Regional News, *The News & Observer*, *The New York Times*, NPR, PR Newswire, Rolls-Royce, Volkswagen, *The Wall Street Journal* and *Wyoming Business Report*; and PricewaterhouseCoopers, *Shale Gas: A Renaissance in U.S. Manufacturing?*, December 2011.

TDL Jobs!
Energy
Utilities
Manufacturing

According to a PricewaterhouseCoopers study, high rates of shale gas recovery could result in a million new U.S. manufacturing jobs by 2025.

www.profoundlydisconnected.com

AMERICA'S SKILLS GAP

THE GROWING CRISIS FOR SKILLED LABOR

TODAY'S TRADESPENSION

AVERAGE AGE:
56

YEARS UNTIL RETIREMENT:
5-15

10 million

NEW SKILLED WORKERS NEEDED BY 2020

SKILLED WORKER: A worker who has a special skill, knowledge, or ability in technical work.
(ie. Factory worker, bricklayer, electrician etc.)

600,000

SKILLED JOBS ARE GOING UNFILLED

83%

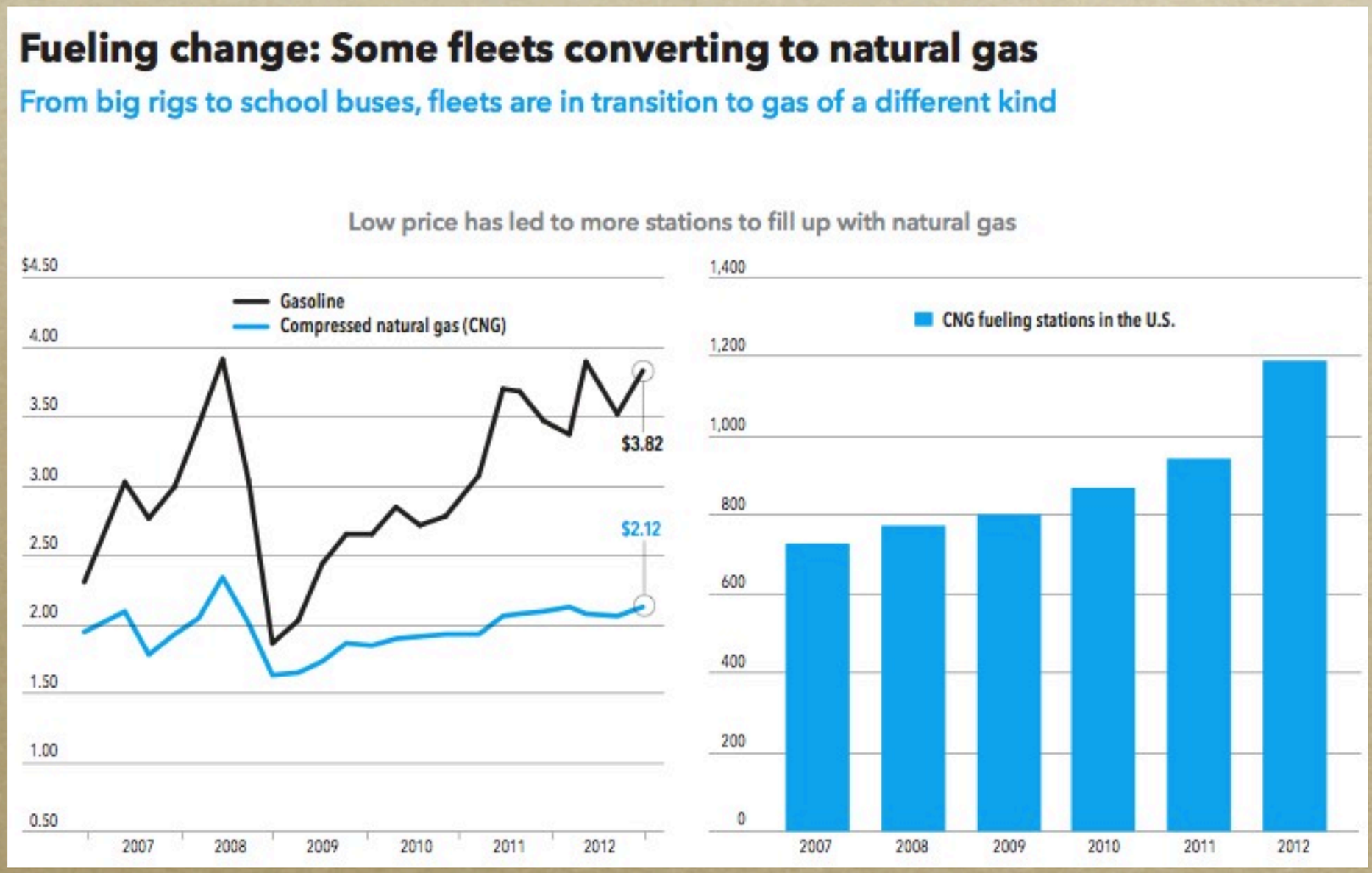
OF COMPANIES REPORT A MODERATE TO SERIOUS SHORTAGE OF SKILLED WORKERS

69%

EXPECT THE SHORTAGE TO GROW WORSE IN THE NEXT 3-5 YEARS

MIKE ROWE WORKS

And one more - Natural Gas Powered Vehicles are coming in a big way.



More From The Pricewaterhouse Cooper report..

Talk to Us....

- *TDL Jobs --- Plentiful?*
- *Education required for most TDL jobs?*
- *Yet employers struggle to find good candidates.....*

Our Guiding Questions

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- *If we are trying to prepare people for work in business and industry, why do we so seldom ask business and industry what they (our students) actually need to know?*

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- *If we are trying to prepare people for work in business and industry, why do we so seldom ask business and industry what they (our students) actually need to know?*

- *Or worse, why do we ignore their answers?*

We did ask industry

- *This presentation is the result of several employment screening exams from fortune 200 employers, screening exams from smaller companies, review manuals for skilled trades positions, and the Work Keys review manual.*
- *The majority of the jobs highlighted here pay from $35,000 to well in excess of $100,000 as the exams are from larger employers that often "steal" talent from employers paying less. Many of these jobs require only on the job training. Others may require an*

The Too Often Ignored Option

- *Ironically, many of the employers that require these types of skills will pay for their employees' tuition costs in an effort to obtain an associates or bachelors degree. But you have to get in the door!*
- *Morton Industries tour Example*


denverpost.com

For millions of college graduates, degrees aren't paying off

PRINT EMAIL
27 COMMENTS
STORY STATS

Meagan Pant, Dayton Daily News

POSTED: 02/06/2013 01:00:00 AM MST

Torix F. Buckley Jr. 16 days ago

Part of the problem that recent college graduates may have in obtaining gainful employment may arise from the following, based on my own experience with hiring recent college graduates:

Inability to construct a grammatical sentence.
Inability to spell correctly.
Inability to write legibly.
Inability to do basic arithmetic.
Lack of manners; inability to interact with others in a civilized manner.
Inability to communicate orally without resorting to pop-culture jargon.
Generally unintelligible speech.
Slovenly, unkempt appearance.
Disdainful attitude. Lazy. Unwilling to put forth effort.
Dishonest. Unabashed about stealing or falsifying hours.
Undependable. May or may not show up for work. May or may not work the required hours.

Torix F. Buckley Jr. 16 days ago

If a kid could come in without all of that baggage, he'd be head and shoulders above the rest. **If I could find someone like that, they could pretty well name their own price, degree or no degree.**

You can teach people job skills.

You can't teach character, integrity and ambition.

Sometimes, it is the obvious answer

There are 300 students in the 10th grade.
Mary and Mark want to find out the 10th grades favorite color.
Mary asks 30 people.
Mark asks 150 people.
Mark says, “My conclusions are more likely to be reliable than Mary’s.”
Why does Mark think he is right?

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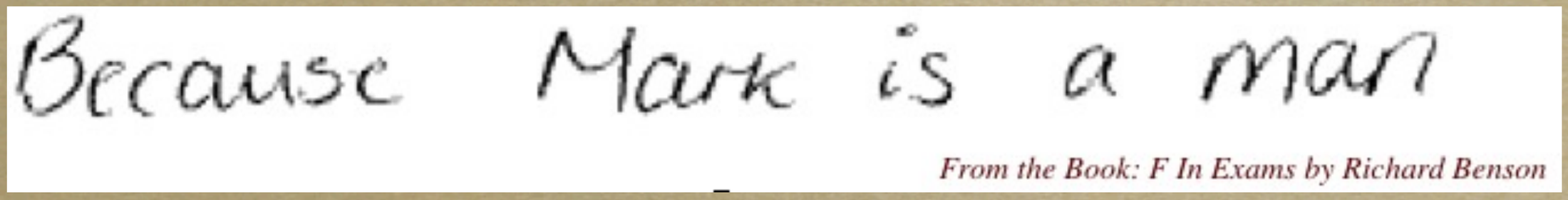

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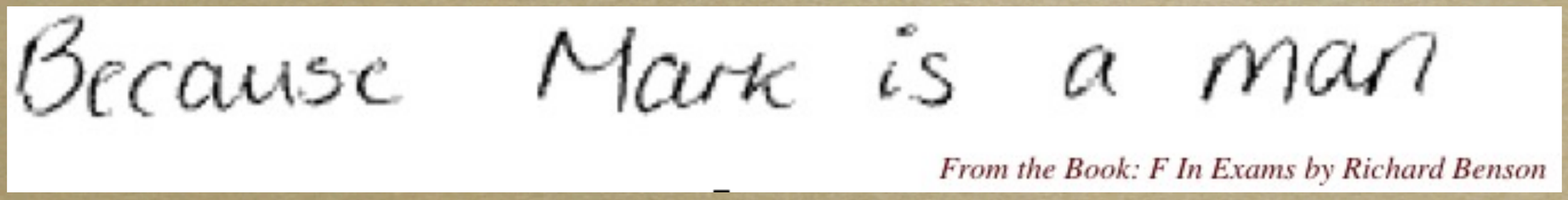
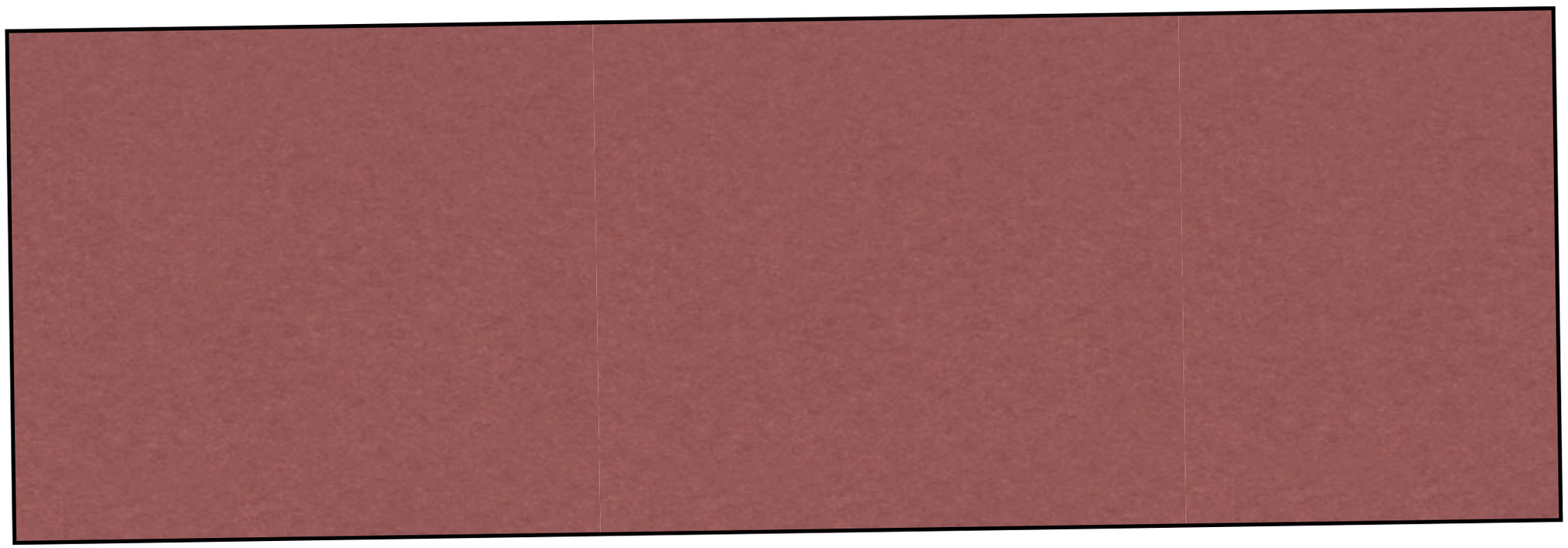


It is Actually This type of analytical thinking that our STEM jobs require - (Maybe not that answer)

What would industry do with this guy?

Steve is driving his car. He is travelling at 60 feet/second and the speed limit is 40 mph. Is Steve speeding?



From the Book: F In Exams by Richard Benson

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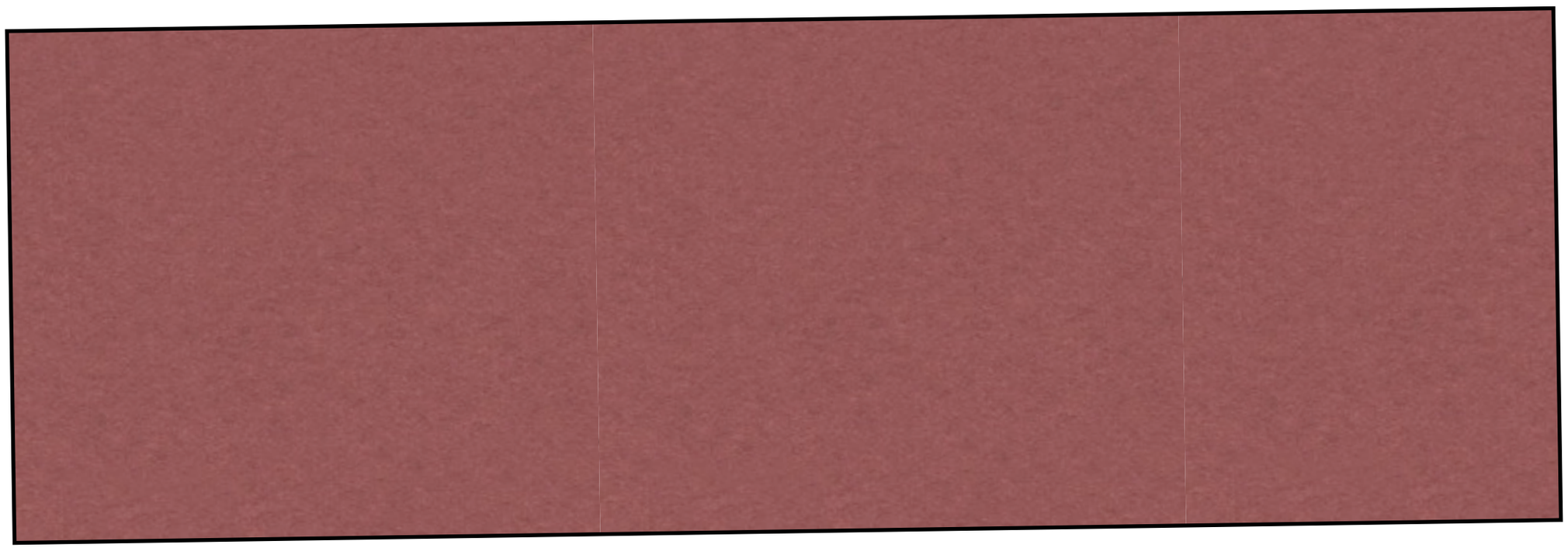

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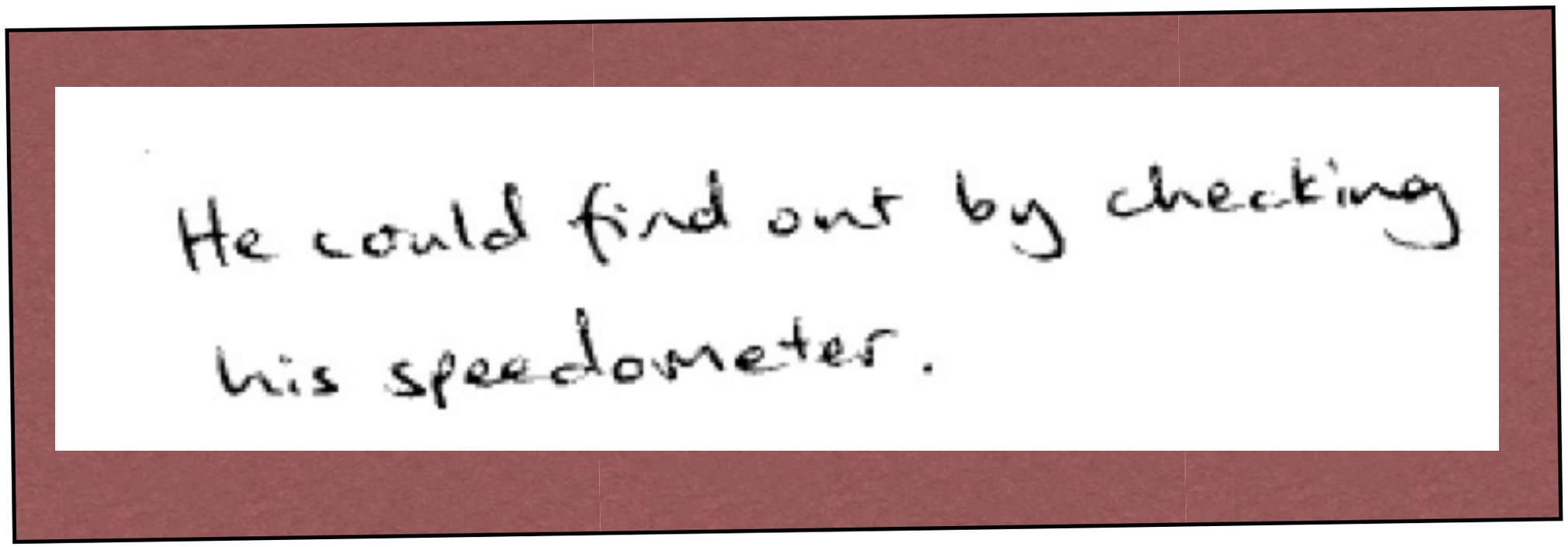

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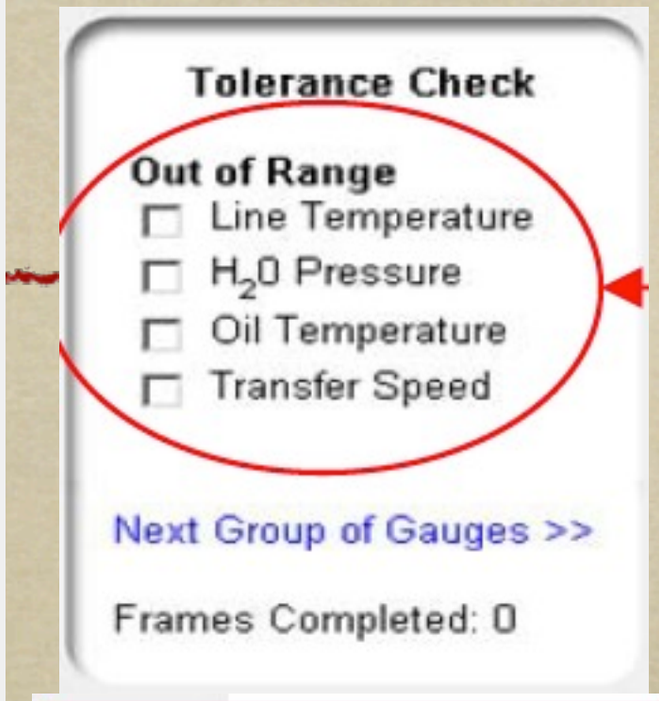
Operations Practice Test Question from a Fortune 200 Company



Select the out of range gauges.

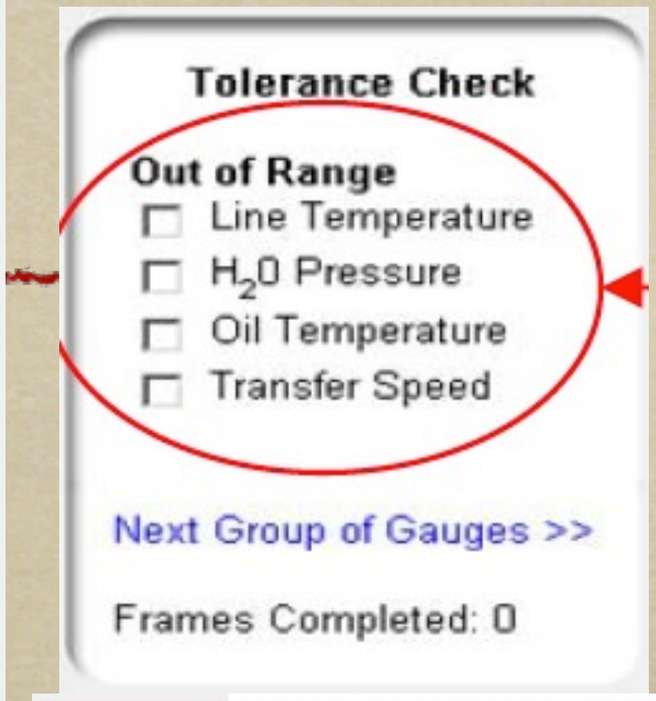
Tolerance Limits:

Line Temperature: 25° to 35° H_2O Pressure: 20 PSI to 28 PSI

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

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

Operations Practice Test Question from a Fortune 200 Company



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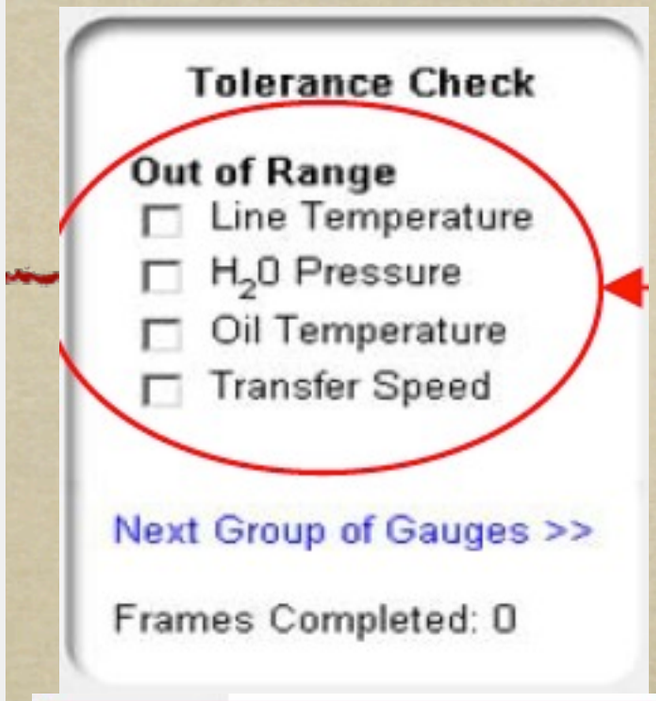

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K-12.MP.4 - Model with Math - Usually Associated with things Beyond College Ready
Honestly you would be hard pressed to find a Math "Content" Standard which looks at this

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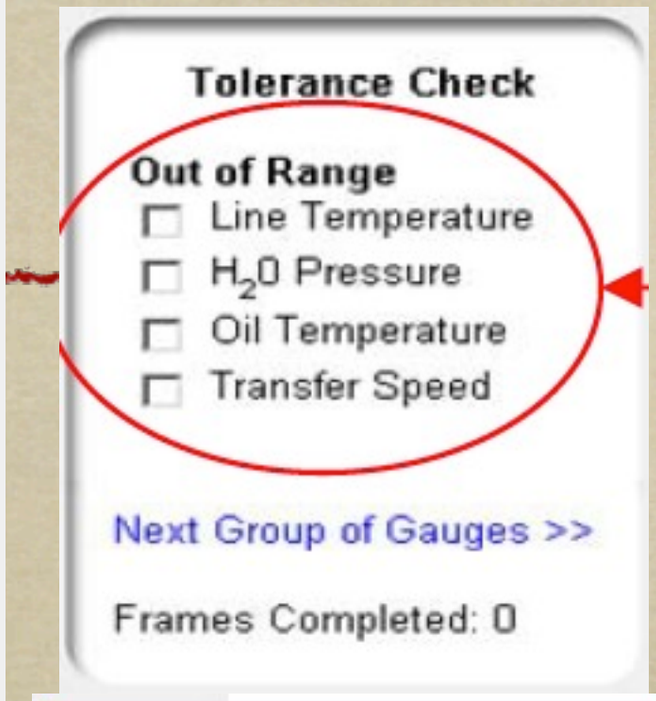

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ELA CC.11-12.R.ST.7 (Reading in Science and Tech)

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Logistics Exam Questions

Source - Fortune 200 Companies Logistical Practice Examination

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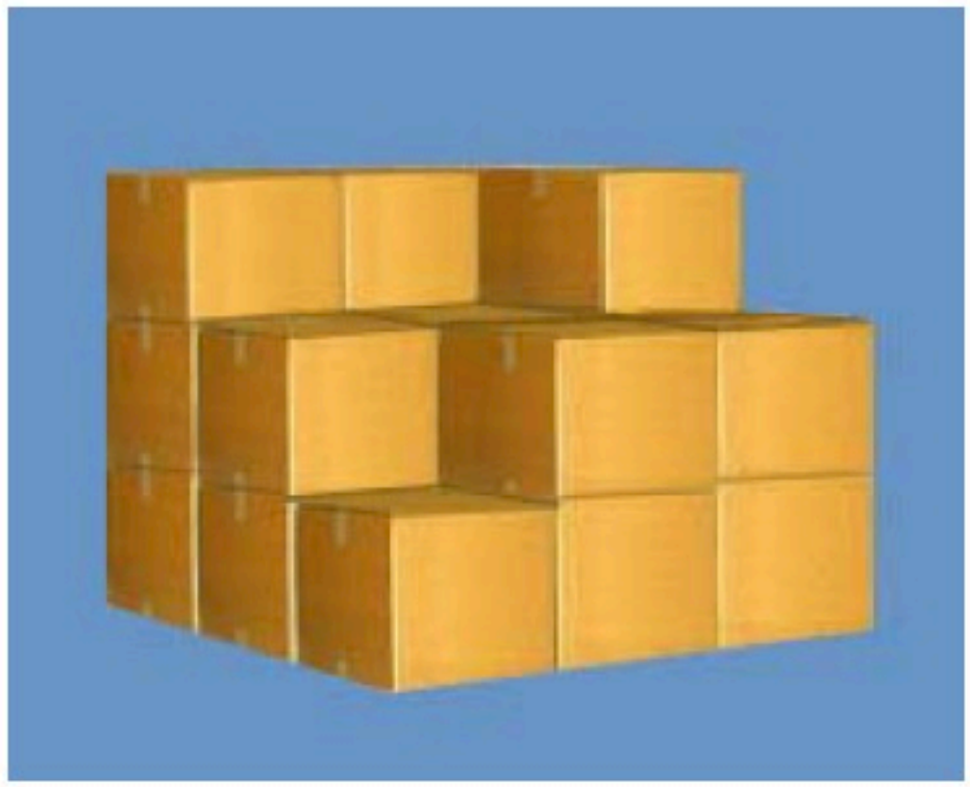
5. The cubes in this illustration represent boxes in a warehouse. How many boxes are there?



A. 21
B. 22
C. 23
D. 24

Logistics Exam Questions

Source - Fortune 200 Companies Logistical Practice Examination

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There is No Common Core Math Standard related to Spatial Relationships!

Logistics Exam Questions

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

Logistics Exam Questions

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Answer questions 3 – 4 based on the diagram below.

Quantity	Part Number	Description	Location
10	10-776-416	Ream Paper – Letter	10-315
15	10-778-418	Ream Paper – Legal	10-315
2	10-419-669	Binders	11-141

3. How many reams of legal paper are in inventory?
   A. 2
   B. 10
   C. 15
   D. 10315
4. How many items with part number 10-419-669 are in inventory?
   A. 2
   B. 10
   C. 15
   D. 11141

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CC ELA 4.R.I.7

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CC K-12.MP.4

CC ELA 4.R.I.7

Math Practice but no grade level standard

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

Paper Prices					
Group I	Type				
Weight	A	B	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	Type				
Weight	A	B	C	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 I	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 Category	
Grade	Code
Writing	A
Offset	B
Opaque	C
Index/Tag	D
Cover	E

6. According to these reference tables, what is the price of # 32, opaque grade, crimson paper?

A. 0.26
B. 0.27
C. 0.28
D. 0.29

Source - Fortune 200 Companies Logistical Practice Examination

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Group I	Type				
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#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	Type				
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#24	0.18	0.20	0.22	0.24	0.26
#28	0.21	0.23	0.25	0.27	0.29
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Color Selection	
Group I	Group II
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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 Category	
Grade	Code
Writing	A
Offset	B
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

Source - Fortune 200 Companies Logistical Practice Examination

Operation Practice Test

Sample Question

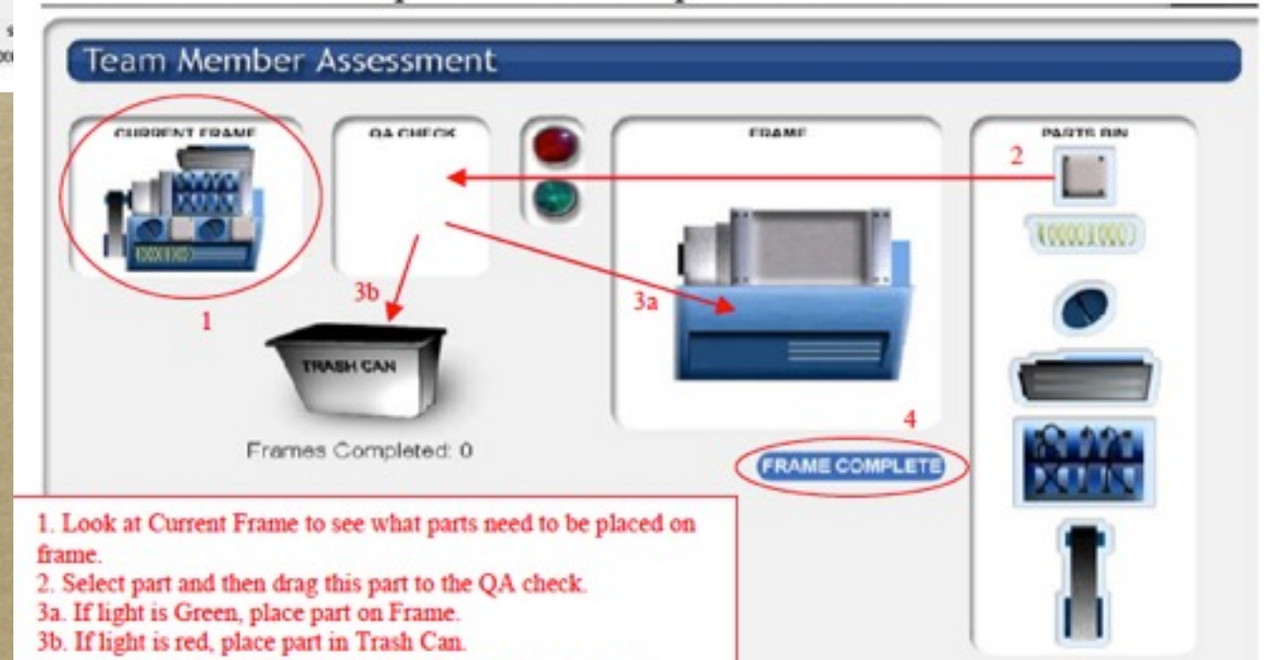
Source: Fortune 200 Company practice exam

2. Initial Assembly Exercise

Logical Sequential Thinking
Spatial Relationships
Procedures

Where is this taught in our schools?

See below for an example of how to complete this exercise:



2. Initial Assembly Exercise

Operation Practice Test

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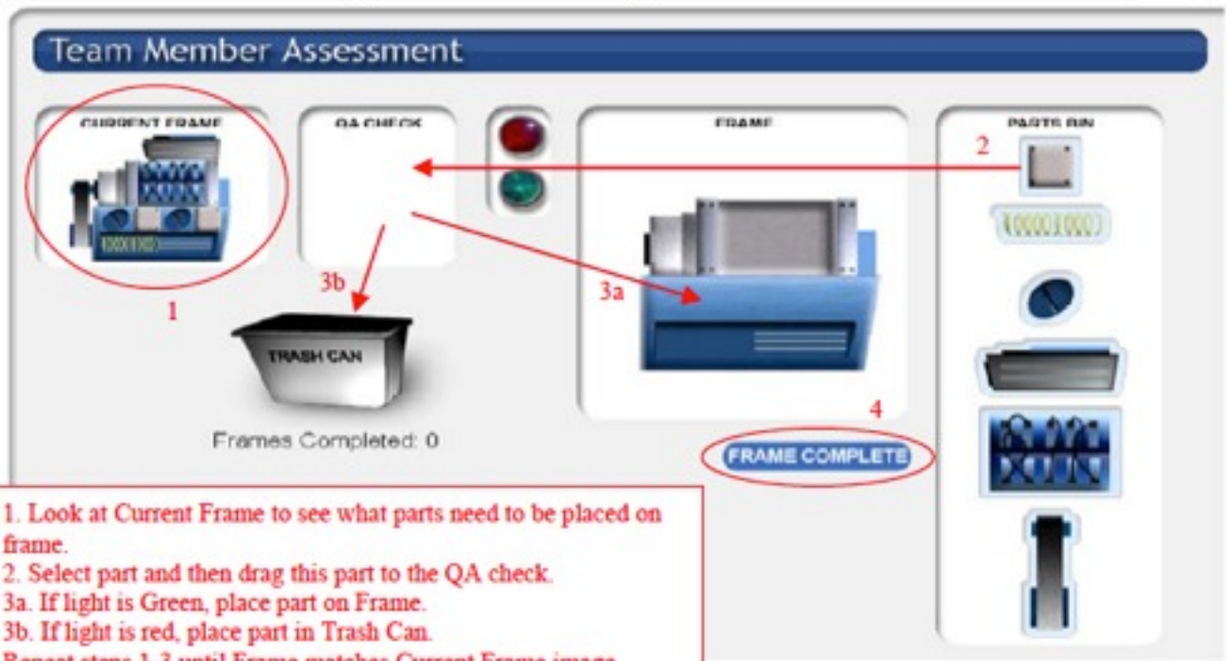
Logical Sequential Thinking
Spatial Relationships
Procedures

None of these terms yield a hit in a search of Math or ELA Common Core

Where is this taught in our schools?

See below for an example of how to complete this exercise:



Yet one of our nations' largest employers

thinks it is important enough to put in their

Pre-Employment Exam

Yet one of our nations' largest employers thinks it is important enough to put in their

Pre-Employment Exam

I'm No Einstein, but it seems to me this may help to explain some of industries frustration with education

Another Option - the National Career Readiness Certificate
Putting It in Dollars and Sense

BERNER food & beverage™

Students may need to educate their potential employer.

"Businesses that hire NCRC...."

Return on Investment

- **Reduction in Turnover in One Department**
  - **2009 13 Terminations, $215,000 Cost**
  - **2010 12 Terminations, $188,000 Cost**
  - **2011 1 Termination, $15,600 cost**
  - **WorkKeys/NCRC Implemented**

- **Reduction in Workers Compensation 57% Reduction over 2011 vs. 2009**

- **Non-Conforming Product – Dollars 80% Reduction in Non-Conforming**

CERTIFY YOUR WORKFORCE

The National Career Readiness Certificate (NCRC™), issued by ACT, is a portable, evidence-based credential that certifies essential skills needed for workplace success.

This credential is used across all sectors of the economy and verifies the following cognitive skills:

- Problem solving
- Critical thinking
- Reading and using work-related text
- Applying information from workplace documents to solve problems
- Applying mathematical reasoning to work-related problems
- Setting up and performing work-related mathematical calculations
- Locating, synthesizing, and applying information that is presented graphically
- Comparing, summarizing, and analyzing information presented in multiple related graphics

INDIVIDUALS CAN EARN THE NCRC BY TAKING THREE WORKKEYS® ASSESSMENTS:

- APPLIED MATHEMATICS
- LOCATING INFORMATION
- READING FOR INFORMATION

WorkKeys assessments measure "real world" skills that employers believe are critical to job success. Test questions are based on situations in the everyday work world.

CERTIFICATE LEVEL	LEVEL SCORE REQUIREMENTS	PERCENTAGE OF QUALIFIED JOBS IN WORKKEYS DATABASE*
Platinum	Minimum score of 6 on each of the three core areas	Examinee has necessary foundational skills for 99% of the jobs in the WorkKeys database
Gold	Minimum score of 5 on each of the three core areas	Examinee has necessary foundational skills for 93% of the jobs in the WorkKeys database
Silver	Minimum score of 4 on each of the three core areas	Examinee has necessary foundational skills for 67% of the jobs in the WorkKeys database
Bronze	Minimum score of 3 on each of the three core areas	Examinee has necessary foundational skills for 16% of the jobs in the WorkKeys database

* The Certificate is only one of many selection criteria employers use when hiring and promoting. Earning the National Career Readiness Certificate is not a substitute for meeting other job requirements. Employers who require specific levels of WorkKeys scores are encouraged to perform job analysis. Learn more at actworkkeys.com/analysis.

The National Career Readiness Certificate

- Certifies an individual has the foundational skills essential for career readiness and job success
- Reports on-the-job reality as identified by productive workers
- Earned endorsements and funding by dozens of States, Trade Associations, and Unions

improve yourself ACT

What does the NCRC Measure?

The NCRC measures problem solving and critical thinking skills in the context of:

- **Reading** – applying information from workplace documents to solve problems
- **Math** – applying reasoning to work-related problems; setting up and performing calculations
- **Locating Information** – synthesizing, applying, comparing from multiple, related graphics

improve yourself ACT

What does the NCRC Measure?

In addition to the cognitive skills, the **NCRC Plus** ranks individuals in four soft skills.

- **Work Discipline** – productivity, dependability
- **Teamwork** – tolerance, communication, attitude
- **Customer Service Orientation** – interpersonal skills, perseverance
- **Managerial Potential** – persuasion, enthusiasm, problem solving

improve yourself ACT®

Does it work?
Examples from Employers

- **Turnover:** down 35%, 37%, even 83%
- **Training:** costs down 96%, time down 50%
- **Screening Time:** down 75%
- **Workers' compensation** expense down: 95% over two years
- **Nonconforming product** expense down: 80% over two years
- **Recommendations:** 97% of businesses

improve yourself ACT®

Another Way of Putting It

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Economic News Release

SHARE ON: EPP FONT SIZE:

Table 6. The 30 occupations with the largest projected employment growth, 2010-20

Table 6. The 30 occupations with the largest projected employment growth, 2010-20
(In thousands)

Occupation	Occupational group	Employment 2010	Employment 2020	Change Number	Change Percent	Typical education needed for entry(1)	Pre-empl
Registered nurses	Healthcare Practitioners and Technical Occupations	2,737.4	3,449.3	711.9	26.0	Associate's degree	
Retail salespersons	Sales and Related Occupations	4,261.6	4,968.4	706.8	16.6	Less than high school	
Home health aides	Healthcare Support Occupations	1,017.7	1,723.9	706.3	69.4	Less than high school	
Personal care aides	Personal Care and Service Occupations	861.0	1,468.0	607.0	70.5	Less than high school	
Office clerks, general	Office and Administrative Support Occupations	2,950.7	3,440.2	489.5	16.6	High school diploma or equivalent	
Combined food preparation and serving workers, including fast food	Food Preparation and Serving Related Occupations	2,682.1	3,080.1	398.0	14.8	Less than high school	
Customer service representatives	Office and Administrative Support Occupations	2,187.3	2,525.6	338.4	15.5	High school diploma or equivalent	
Heavy and tractor-trailer truck drivers	Transportation and Material Moving Occupations	1,604.8	1,934.9	330.1	20.6	High school diploma or equivalent	
Laborers and freight, stock, and material movers, hand	Transportation and Material Moving Occupations	2,068.2	2,387.3	319.1	15.4	Less than high school	
Postsecondary teachers	Education, Training, and Library Occupations	1,756.0	2,061.7	305.7	17.4	Doctoral or professional degree	
Nursing aides, orderlies, and attendants	Healthcare Support Occupations	1,505.3	1,807.2	302.0	20.1	Postsecondary non-degree a	
Childcare workers	Personal Care and Service Occupations	1,282.3	1,544.3	262.0	20.4	High school diploma or equivalent	
Bookkeeping, accounting, and auditing clerks	Office and Administrative Support Occupations	1,898.3	2,157.4	259.0	13.6	High school diploma or equivalent	
Cashiers	Sales and Related Occupations	3,362.6	3,612.8	250.2	7.4	Less than high school	
Elementary school teachers, except special education	Education, Training, and Library Occupations	1,476.5	1,725.3	248.8	16.8	Bachelor's degree	
Receptionists and information clerks	Office and Administrative Support Occupations	1,048.5	1,297.0	248.5	23.7	High school diploma or equivalent	

Last Modified Date: February 01, 2012

Another Way of Putting It

*IT **IS** THE ECONOMY, STUPID!*

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Economic News Release

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Last Modified Date: February 01, 2012

The NCRC in TDL Terms

Table 3. Work Readiness Benchmarks for Occupations with the Most Openings by Education Group (2010–2020)

Education Group	SOC Code	Occupation	Reading for Information (Range 3–7)	Applied Mathematics (Range 3–7)	Locating Information (Range 3–6)	Total Openings (2010–2020)
			Median Entry Skill Level			
[illegible] Educati[illegible] [illegible]cupation	53-7062	Laborers & Freight, Stock, & Material Movers	3	3	4	980,200

Bronze

Table 4. Work Readiness Benchmarks for the Highest-Paying Occupations by Education Group (2010–2020)

Education Group	SOC Code	Occupation	Reading for Information (Range 3–7)	Applied Mathematics (Range 3–7)	Locating Information (Range 3–6)	Median Annual Wage
			Median Entry Skill Level			
	11-3071	Transportation, Storage, & Distribution Managers	5	5	5	$80,210

Gold

Applied Mathematics Level 3

Individuals with Level 3 skills can set up and solve problems with a single type of mathematical operation (addition, subtraction, multiplication, or division) on whole numbers, fractions, decimals, or percentages.

2. The fraternity house you manage has 6,270 square feet of lot space. City ordinance allows one student for every 330 square feet of lot space. How many students can live in this house?

A. 19
B. 33
C. 297
D. 594
E. 5,940

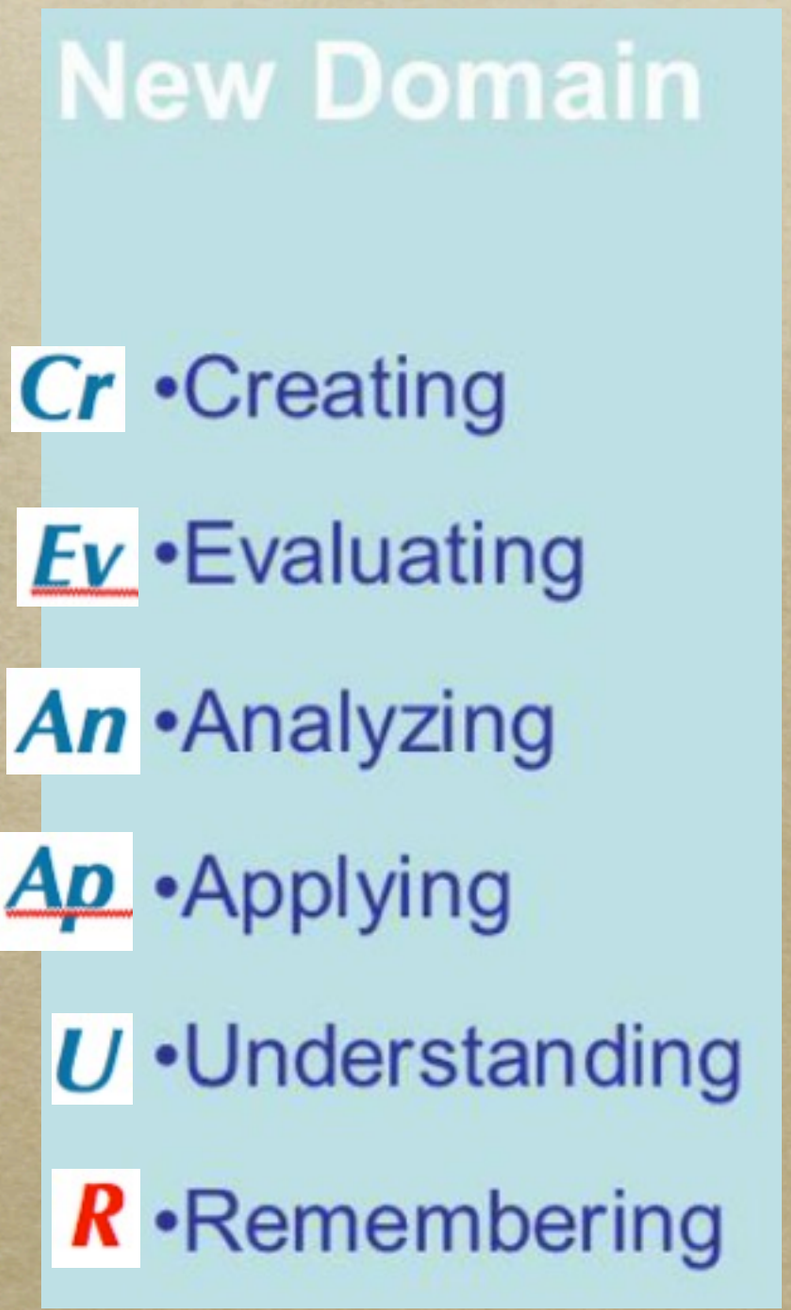
3. A grocer takes delivery of beverages from your truck at $6 per case. You unloaded 53 cases for the grocer today. How much does the grocer owe you?

A. $ 9
B. $ 47
C. $ 59
D. $318
E. $653

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?



Apparently, they need some help.

Teacher-Developed Tests

Cognitive Level of Questions

	R	U	Ap	An	Ev	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

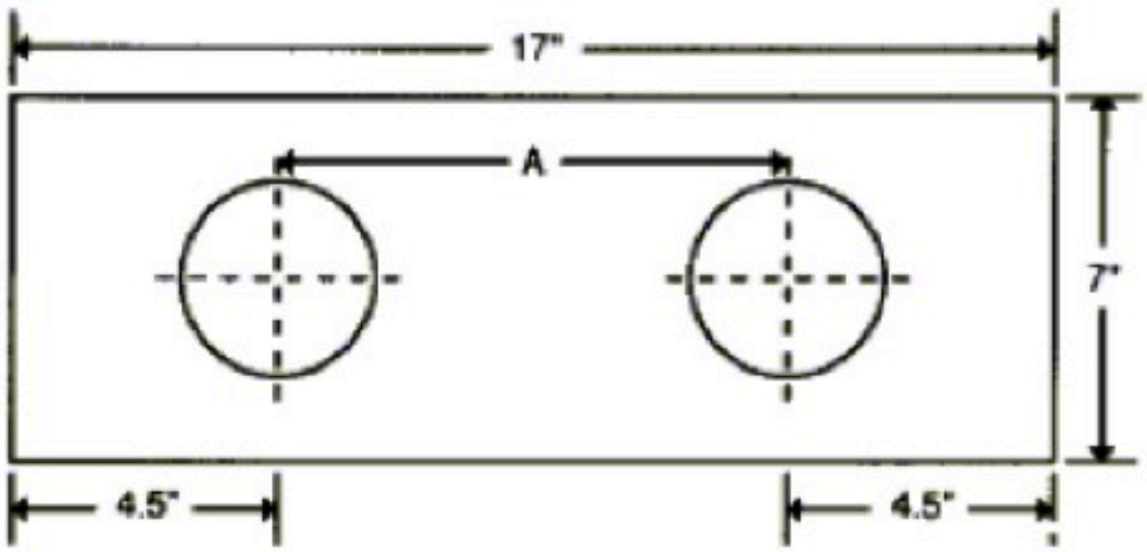
New Domain

- ***Cr*** •Creating
- ***Ev*** •Evaluating
- ***An*** •Analyzing
- ***Ap*** •Applying
- ***U*** •Understanding
- ***R*** •Remembering

Graphic Math - Operator Exam Prep

Source: Fortune 200 Company on-line exam prep

Use the drawing below to answer the two example questions. (Please note that the dimensions shown on the drawing are not necessarily drawn exactly to scale.) Mark your answers to the questions in the "Examples" box on your answer sheet.



CC 2.MD.5

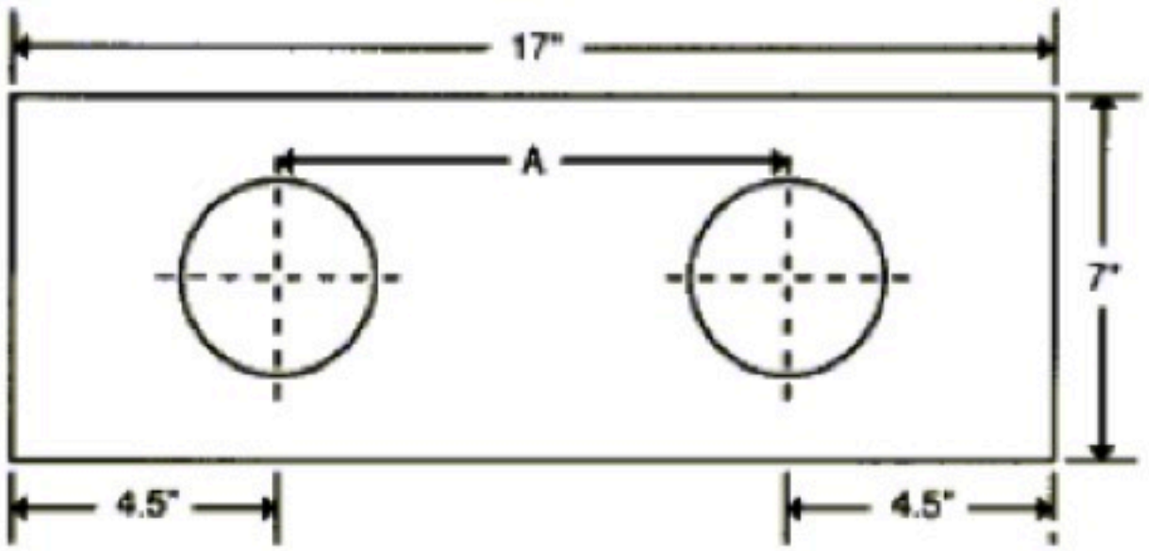
a. What is the distance "A" between the centers of the two holes?

a) 6.0 "
b) 7.0 "
c) 8.0 "
d) 12.5 "
e) N

Graphic Math - Operator Exam Prep

Source: Fortune 200 Company on-line exam prep

Use the drawing below to answer the two example questions. (Please note that the dimensions shown on the drawing are not necessarily drawn exactly to scale.) Mark your answers to the questions in the "Examples" box on your answer sheet.



CC 2.MD.5

b. What was the surface area of the side shown in the drawing before the holes were drilled?

a) 24.0 square inches

b) 79.0 square inches

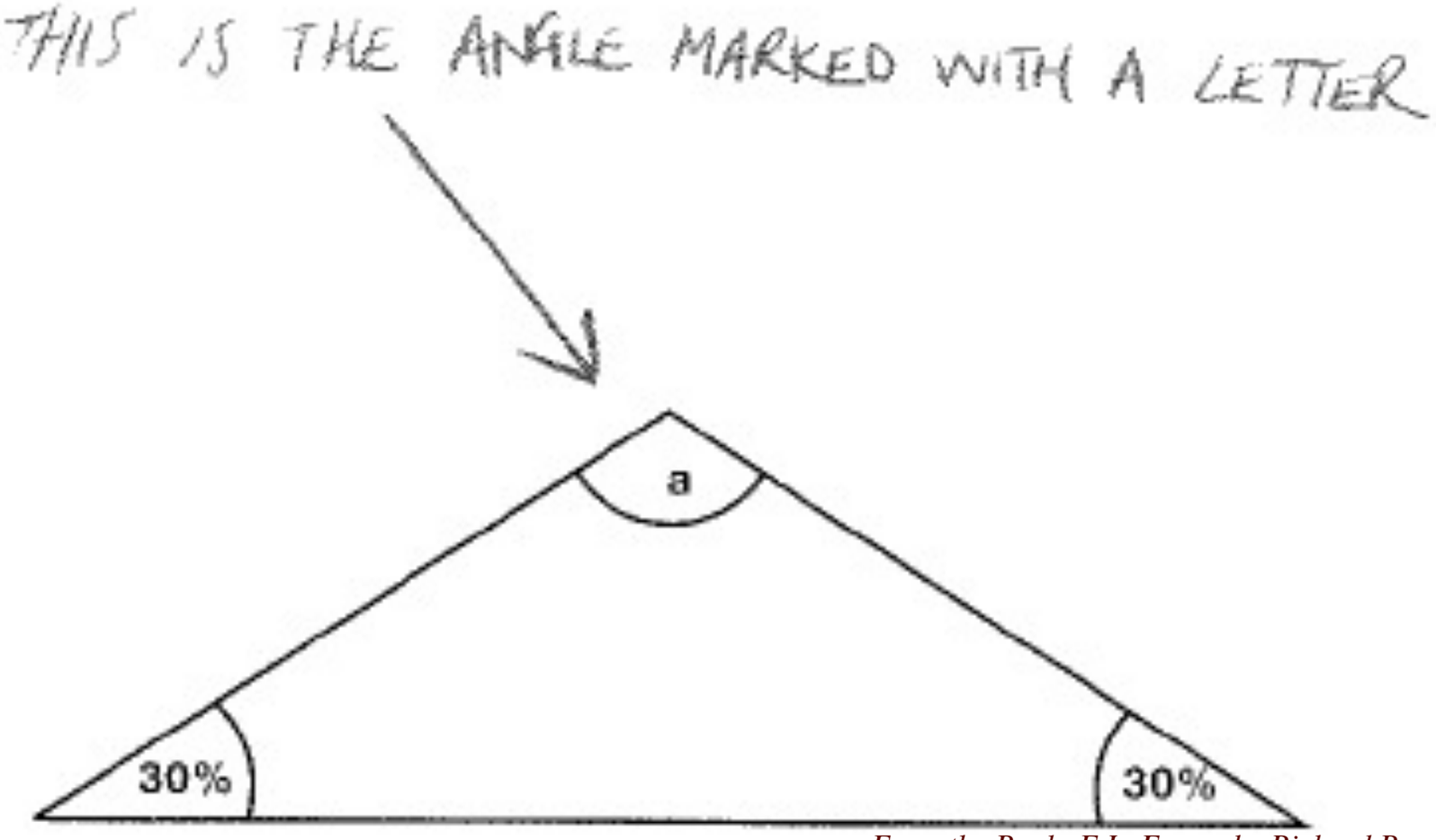
c) 84.0 square inches

d) 109.0 square inches

e) N

This Won't Work In Industry or the Classroom!

Find the angles marked with letters.

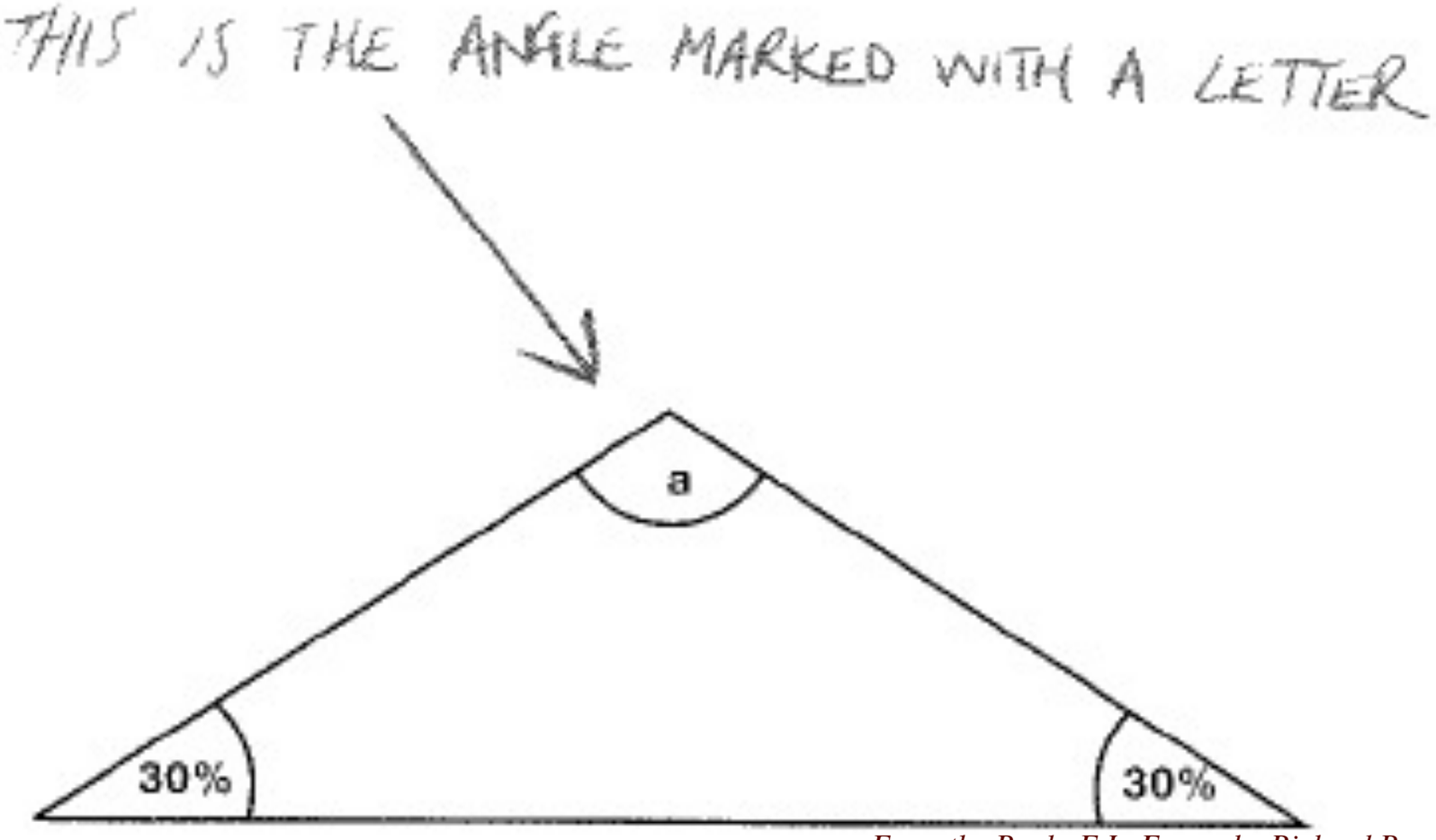


From the Book: F In Exams by Richard Benson

Of course, we all know the answer should be….

This Won't Work In Industry or the Classroom!

Find the angles marked with letters.



From the Book: F In Exams by Richard Benson

Of course, we all know the answer should be.... 120

ASSEMBLY

The Assembly selection test measures a candidate's ability to visualize the properly assembled form of an object..

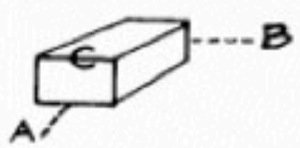
Directions

In this test you are to figure out how something would look if it were put together properly. The parts to be put together are shown at the beginning of each problem and are followed by five pictures showing five different ways the parts could be put together. Only one of them is correct.

Each part is marked with one or more letters, each of which stands for a place on the part. Letters referring to places that do not show are placed outside the part, with a dotted line pointing to the underneath side, or the place that you can't see.

In figure 1 below, the letter A refers to the bottom of the cube. B points to the back of the cube. C refers to the upper front edge of the cube.

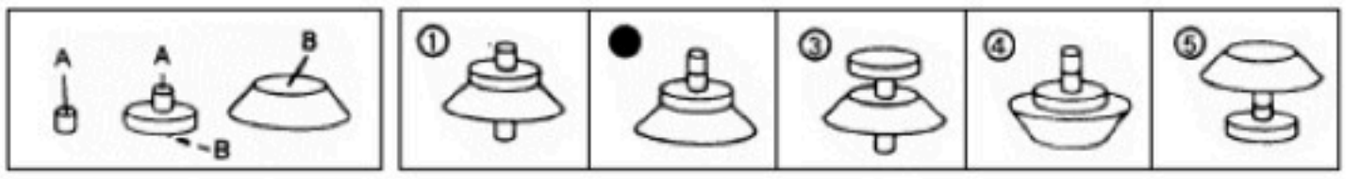
Figure 1



In the test, you are to assemble the parts so that the places having the same letter are put together.

Look at the first sample below. Try to figure out which of the five assemblies is correct.

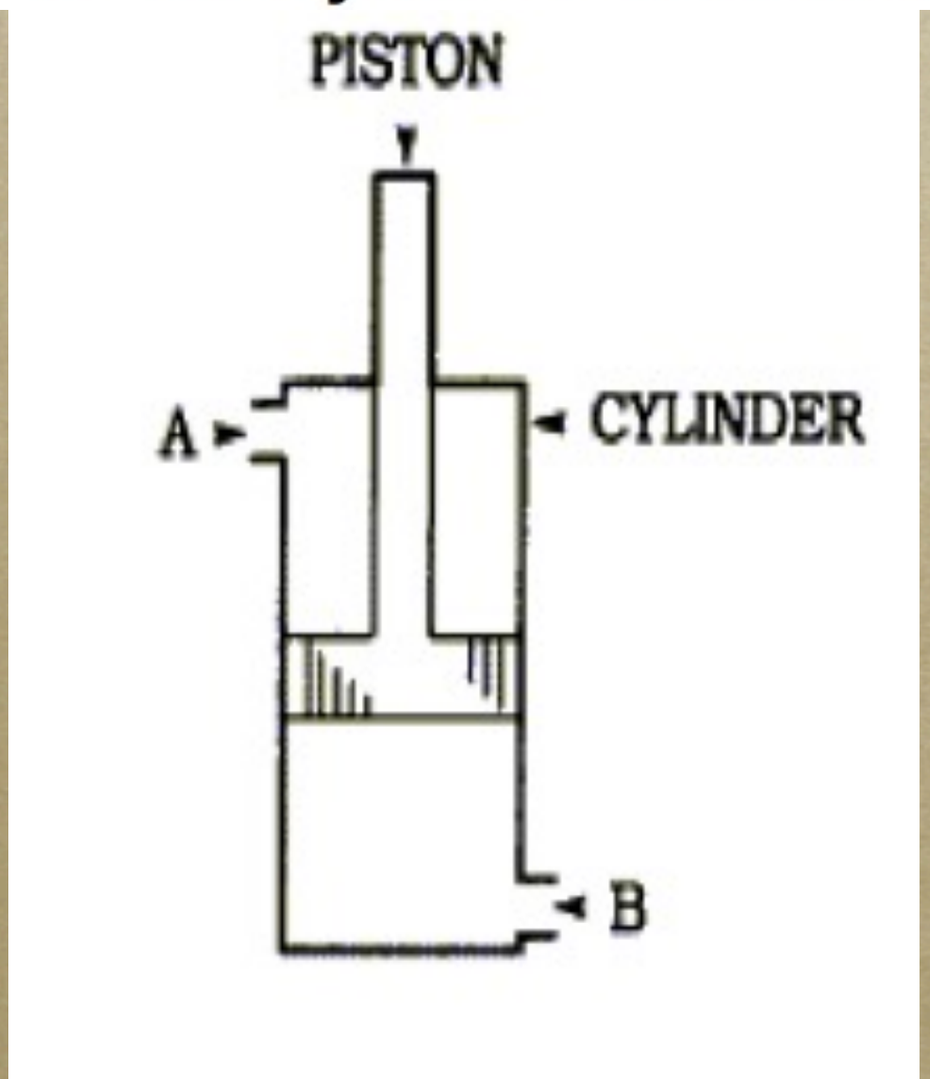
Sample 1



Look at the ends marked A. If the ends marked A were put together, how would they look? Of the five pictures, only pictures 2, 4, and 5 have the ends marked A put together. Now look at the first of the parts marked with a B. Note how the dotted line from B points to the underside, which you cannot see. Which of the pictures 2, 4, and 5 shows the two places marked B put together? Of these three, only picture 2 has the places marked B put together. Therefore, picture 2 is the correct answer. This is the only picture of the five that has all the parts put together in the way the letters show they should be. Therefore, circle 2 has been filled in for Sample 1.

Mechanical Concepts Samples

In the figure below, at which point should pressurized air enter the cylinder to lower the piston? (If both, mark C)



A)

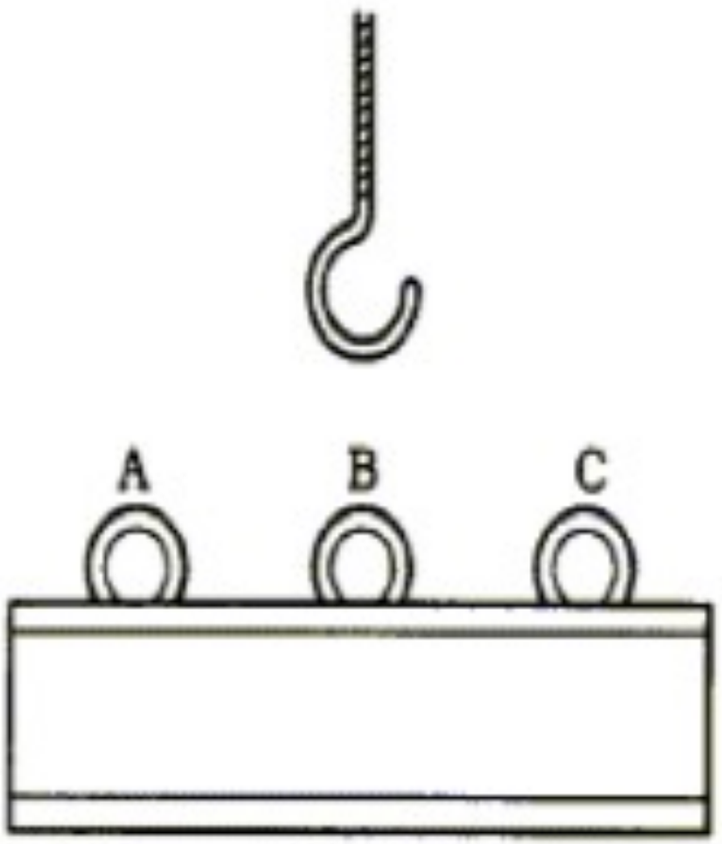
B)

C)Both A and B

Source: Fortune 200 Company on-line exam prep

Mechanical Concepts Samples

y) To keep the beam horizontal when lifted, at which point should you hook the cable?



○ A
● B
○ C

Source: Fortune 200 Company on-line exam prep

Operator Practice Exam

Source: Fortune 200 Company on-line exam prep

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

It's Your Turn

Marketing and Profitability Activity: 9-12 A CED 3, K-12 MP.1, 3, 4 (among others)

The MIRN (Math I Really Need) Snack Mix Company assigns you to a team whose goal is to oversee the "launch" of the company's newest snack product.

MIRN's new snack product's **proposed** batch ratios are:

1 part Pretzels
1 part Cheerios
½ part Candy Corn
1 part Corn Chex cereal
1 part Rice Chex cereal
½ part M&Ms

If we were to change the proposed batch ratio, any snack mixture we take to market must contain all of these ingredients. Each ingredient would have a minimum of .5 ounces in the 8 ounce bag while no ingredient could be more than 4 ounces.

1. Taste the product.

2. Brainstorm a name for the new product. _____

Packaging and Product Cost Data:
The product would be sold in 8-ounce packages.

Ingredient costs:

Pretzels	$3.99/20 oz.
Cheerios	$6.49/120 oz.
Candy Corn	$2.99/20 oz.
Corn Chex Cereal	$1.99/13 oz.
Rice Chex Cereal	$1.99/13 oz.
M&Ms	$8.49/42 oz.

3. Based on the proposed batch ratio, calculate each ingredient's weight in an 8 ounce batch.

Pretzels	____ oz.
Cheerios	____ oz.
Candy Corn	____ oz.
Corn Chex Cereal	____ oz.
Rice Chex Cereal	____ oz.
M&Ms	____ oz.

Cost Considerations: Cost, Profit Margin, & Selling Price

4. What is the product cost of an 8-ounce package? ____

5. What would MIRN charge for an 8-ounce package if they wanted a 20% profit margin (based on product cost)? ____

6. What other costs (expenses) are factored into the selling price of this snack product for us to accurately determine our profit margin & or set our price?

7. What is the least expensive mixture we could produce if we were to alter the proposed batch ratio?

8. Food for thought - Would the formula we find in question 7 be the most profitable for us to bring to market? Why or why not?

This IS higher level math and could go to even more complex levels if we were to incorporate nutrition labels, profit margins, sales data, etc…

More importantly: It is Relevant and Engaging for students. This is "Quadrant D" learning. It is CAREER READY MATH.

summary part 1

- Contextual learning is for “all” students, not just “those” students. (Geometry in Construction)
- USBLS- 75% of projected job openings in the decade ahead need less than an Associate degree.
- Industry no longer has the time/money for developmental training. They expect the “school systems “to teach those skills and industry will do the “technical tweaking” or specific job related skills to remain competitive.
- Industry “pays for skills” and STEM training/integrated approach to education seems to be a viable way of pursuing both a career and a postsecondary degree or credential simultaneously.
- Practices that practically “eliminate potential technicians” from STEM programs are (1) requiring STEM students to take advanced math courses including Pre-calculus and sometimes calculus, (2) or requiring them to choose advanced courses designed to lead into BS science, engineering and information technology programs. (“Career Pathways for STEM technicians”- Dan Hull) WOW!!

Summary Continued

* Many potential STEM technicians may be in the middle quartiles of math and science achievement. These students are interested in math and science and are "hands on" or "contextual/applied" learners with strong spatial learning abilities ("Career Pathways for STEM Technicians"-Dan Hull)

* While many STEM careers require bachelor's or graduate degrees, a large sector of the STEM labor market requires expertise in technical work and other specialties that need less than a bachelor's degree (BLS).

* Overall, BLS estimates that nearly half (45%) of all job openings in the next ten years will require middle level skill. (STEM technicians that are high skill, high wage and high demand in the workforce)

www.cteintrees.org

Three Rivers Education For Employment System

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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

Illustrative Mathematics

Common Core Conversation

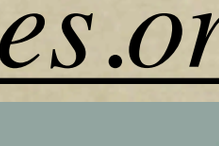
A rich variety of resources

Curriculum Revitalization

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.

IACTE

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

IACTEHandout.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.

NEXT GENERATION SCIENCE STANDARDS For States, By States

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 Response questions which

Contacting Us…

- *Brian Gordon - brian.gordon@jjc.edu*
- *Neal Kauffman - nkauffma@jjc.edu*
- *“TREES” 815-727-2714*
- *This presentation and many other resources available at: www.cteintrees.org*

Sources

- 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's Organization - http://www.profoundlydisconnected.com
- 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
- www.denverpost.com

Why do we continually try to build a bridge to cross the ocean

when what we really need to cross is a stream?