

# UW College of Engineering and Applied Science (CEAS) & School of Energy Resources (SER) STEM Resources for K12

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# THE CHALLENGE

Build the tallest free standing structure out of:

- 20 sticks of spaghetti
- 1 yard of tape
- 1 yard of string
- 1 Marshmallow (has to be on top)

TIME: 12 Minutes

[The Marshmallow Challenge](#)

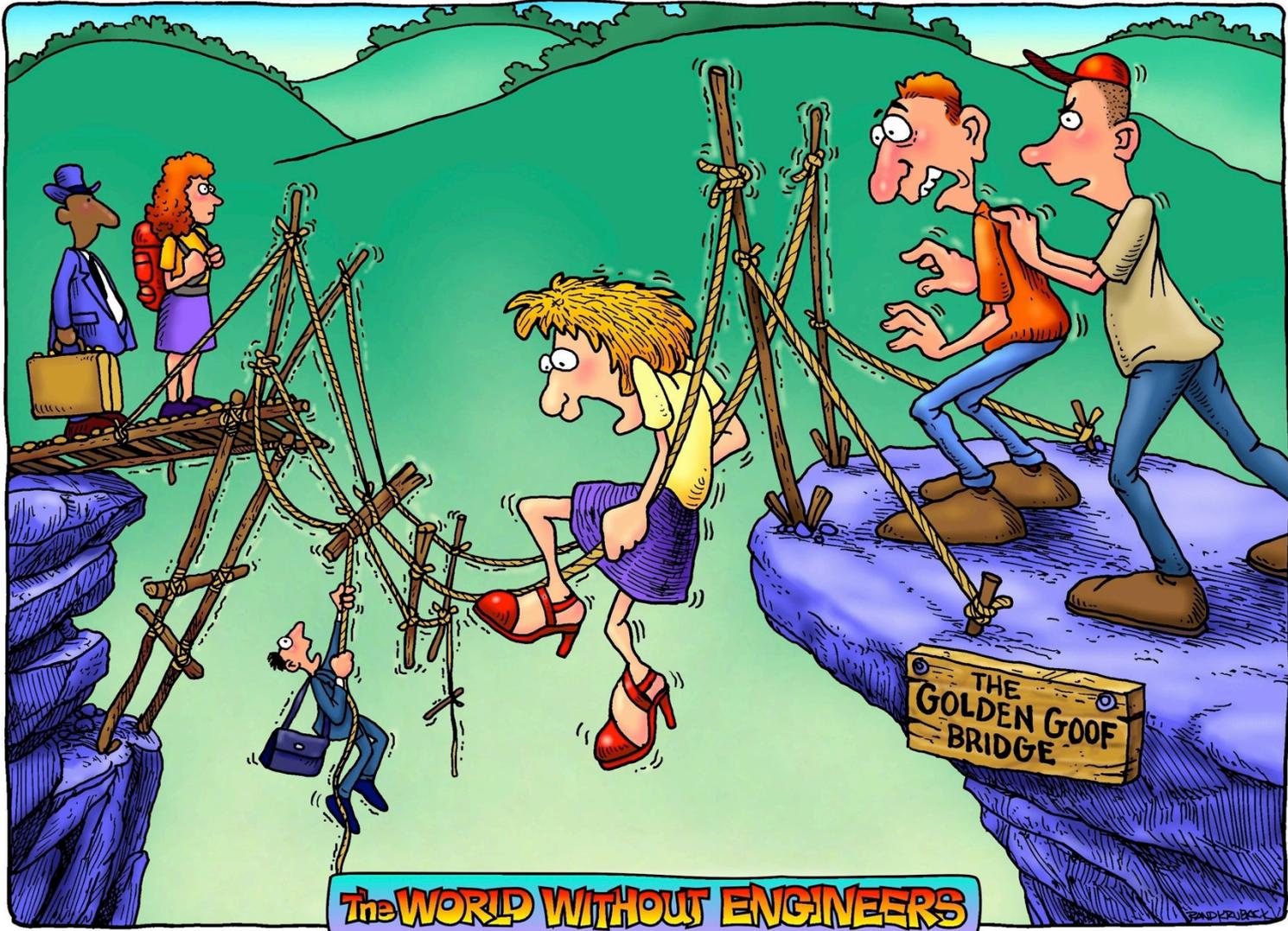


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# Guiding Questions:

- What is Engineering?
- Is there a need for Engineers?
- How do students perceive Engineering?
- How may we increase interest in Engineering?



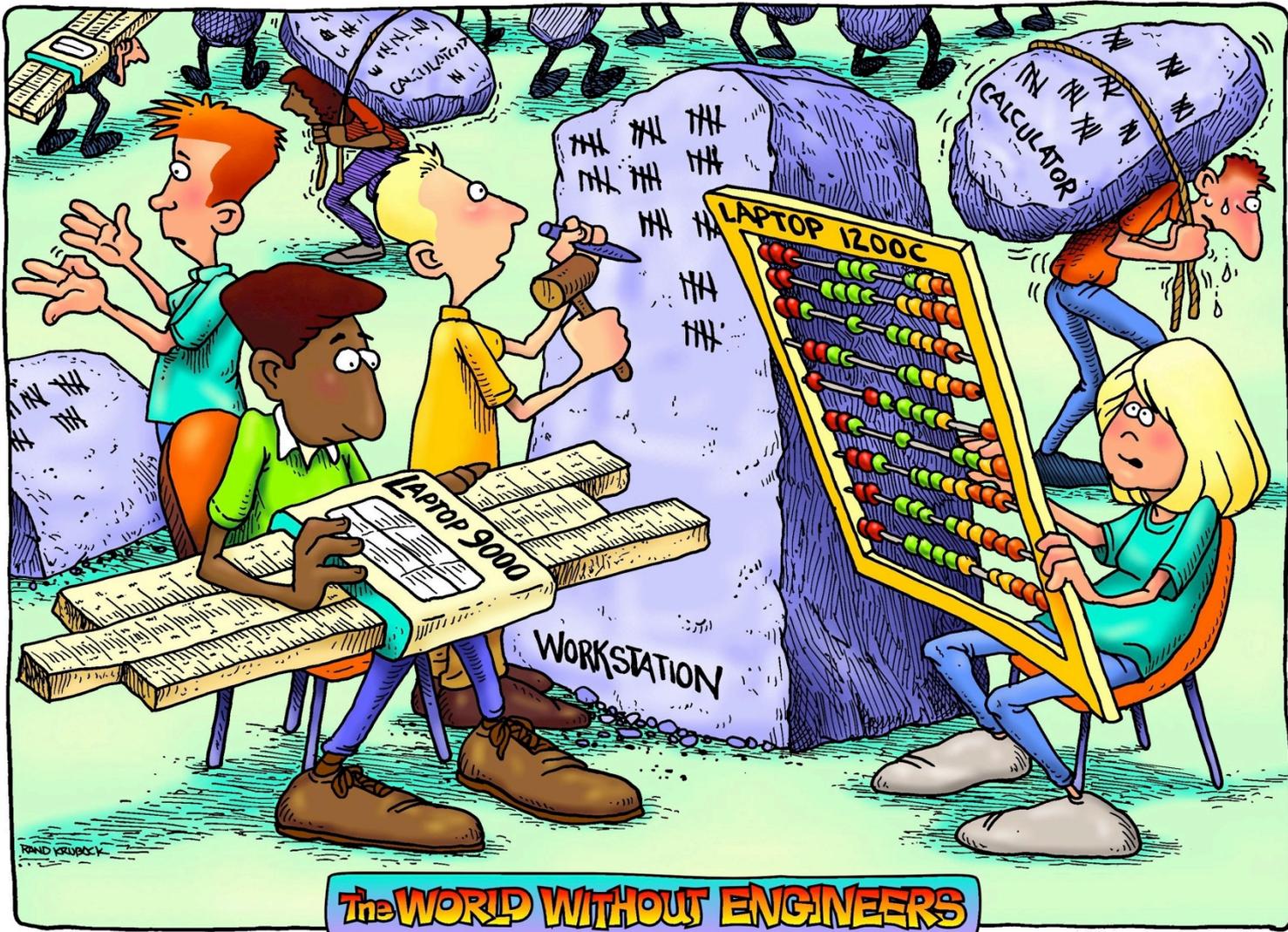


 Agilent Technologies

<http://www.agilent.com/find/edu>



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**The WORLD WITHOUT ENGINEERS**

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# What is Engineering?

~~Engineering combines applied mathematical, scientific, and technical principles, to yield tangible end products-which can be made, produced, and constructed. Engineering addresses human needs and quality of life.~~

# PROBLEM SOLVING



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# Is there a need for engineers?

<https://www.youtube.com/watch?v=p6l8eE8nrjU>



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# IV Warmer



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# Ghana electricity-generation



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# How do students perceive engineering/engineers?



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# Engineers are:

- Creative
- Innovative
- International
- Making a difference
- Improving quality of life
- Leaders and team players
- Solving problems of relevance



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# Why Study Engineering?

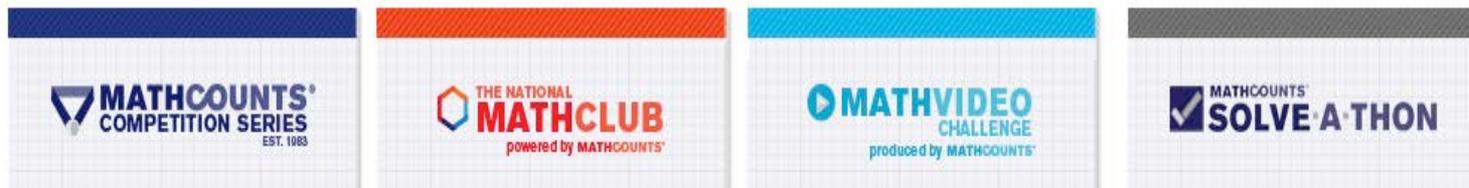
- Shortage of STEM graduates
- Employment Opportunities
- Go anywhere!
- Platform to launch a career
  - Professional practice
  - Medicine
  - Business
  - Law



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# MATHCOUNTS® FOUNDATION

Competition Series – 24 WY schools  
National Math Club – 7 WY clubs  
MathVideo Challenge – 0 that I know of.



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# MathCounts National MathClub

The National Math Club is an inclusive math enrichment program that provides Club Leaders with the resources and materials needed to run a math club. With registration open to schools, organizations and other groups, The National Math Club brings fun and exciting math to students across the country.

Formerly known as the MATHCOUNTS Club Program, The National Math Club helps build confidence in students of all ability and interest levels by giving them the opportunity to engage in unique math activities in a relaxed, social setting.



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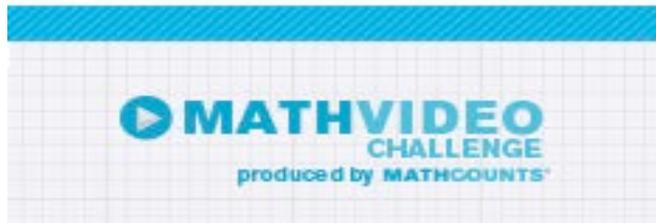


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The Math Video Challenge is an innovative program that empowers students to be math teachers, video producers, actors and artists - all at the same time! Working together in teams, students will create their own videos about math problems and their associated concepts.

Formerly known as the Reel Math Challenge, the Math Video Challenge is designed to get students excited about math while giving them the opportunity to hone their creativity and communication skills. Students will form teams consisting of four students each to create a video that teaches the solution to one of the problems from the *2013-2014 MATHCOUNTS School Handbook*, and also demonstrates the real-world application of the math concept used in the problem.

<http://videochallenge.mathcounts.org/videos>

[https://www.youtube.com/watch?feature=player\\_embedded&v=ZlaPxy0zIS4](https://www.youtube.com/watch?feature=player_embedded&v=ZlaPxy0zIS4)



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# TEAMS/ExxonMobil Challenge

Test of engineering aptitude, mathematics and science

2014 topics were based on the general theme “restore and improve urban infrastructure” that is identified as one of the [National Academy of Engineering Grand Challenges](http://www.nationalacademies.org/engr/grandchallenges/)



<http://teams.tsaweb.org/>

<http://www.uwyo.edu/ser/energy-literacy/>



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# Energy Summer Institute



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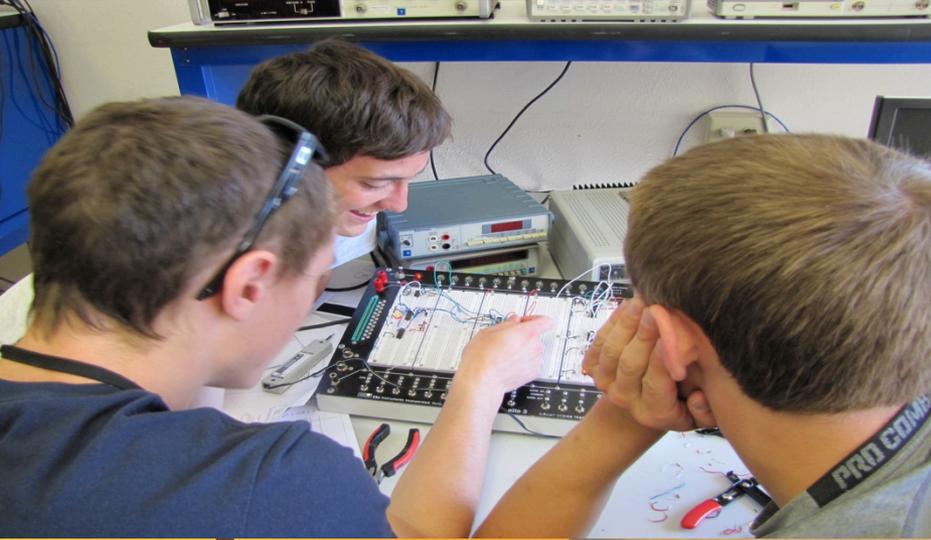
Engineering

14

Summer

Program

for high school juniors



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# Discussion

How do we help support interest in engineering?

What are your greatest challenges/needs for promoting STEM?

What are some of your success stories?

Moving forward- next steps?

Engineering Summer Program for teachers



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# Web Pages

MathCounts

<http://mathcounts.org/>

Engineering Summer Program

<http://www.uwyo.edu/ceas/high-school/esp/index.html>

School of Energy Resources K-12 Outreach

<http://www.uwyo.edu/ser/energy-literacy/>

TEAMS

<http://teams.tsaweb.org/>

National Academy of Engineering Grand Challenges

<http://www.engineeringchallenges.org/cms/8996/9221.aspx>



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# Video links

## Why Study Engineering

<https://www.youtube.com/watch?v=zoHm5AXeYYQ>

An engineer's dog ball thrower

<https://www.youtube.com/watch?v=4PcL6-mjRNk>

## Apollo 13 – Square Peg in a Round Hole

<https://www.youtube.com/watch?v=C2YZnTL596Q>

Apollo 13 – Failure is not an option

<https://www.youtube.com/watch?v=KhoXFVQslxw>

## Spotlight On Engineering with Pauley Perrette

<https://www.youtube.com/watch?v=p6l8eE8nrjU>

What Most Schools Don't Teach

[https://www.youtube.com/watch?v=nKlu9yen5nc&feature=player\\_embedded](https://www.youtube.com/watch?v=nKlu9yen5nc&feature=player_embedded)

## What Most Schools Don't Teach (Short Version)

<https://www.youtube.com/watch?v=qYZF6olZtfc>



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