



Dwight Look College of

ENGINEERING
TEXAS A&M UNIVERSITY

2016 Teacher Summit & PK-12 Leadership Forum

Shelly Tornquist
Director, PK-12 Engineering
Education Outreach



- <https://www.youtube.com/watch?v=bipTWWHya8A>



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Engineers...

Be Creative!

Make a
difference

Work
everywhere

**Are in
demand!**

Get to do cool
stuff

Get to travel

**Earn good
money**

Work on
interesting
projects

Change, or
rather
CREATE a
new world!

Have a good work/life
balance

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Women in STEM

stems Summit.tamu.edu



- http://www.youtube.com/watch?v=X0HWN_TQ1iDM



- http://www.nae.edu/Activities/Projects/grand-challenges-project/Videos_grandchallenges.aspx

The Grand Engineering Challenges

- Make solar energy affordable
- Provide energy from fusion
- Develop carbon sequestration methods
- Manage the nitrogen cycle
- Provide access to clean water
- Restore and improve urban infrastructure
- Advance health informatics
- Engineer better medicines
- Reverse-engineer the brain
- Prevent nuclear terror
- Secure cyberspace
- Enhance virtual reality
- Advance personalized learning
- Engineer the tools for scientific discovery

"Meeting these challenges would be 'game changing,'" said NAE president Charles M. Vest. "Success with any one of them could dramatically improve life for everyone."



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More than 25 major branches of
Engineering and over 100 specialties!

Manufacturing
Mechanical Robotics
Aerospace
Nuclear Biomedical **Civil** Metallurgical
Automotive Structural Chemical Transportation
Petroleum **Electrical** Architectural
Ceramic Environmental
Computer Software
Agricultural Ocean Industrial
Telecommunications Food **Systems**

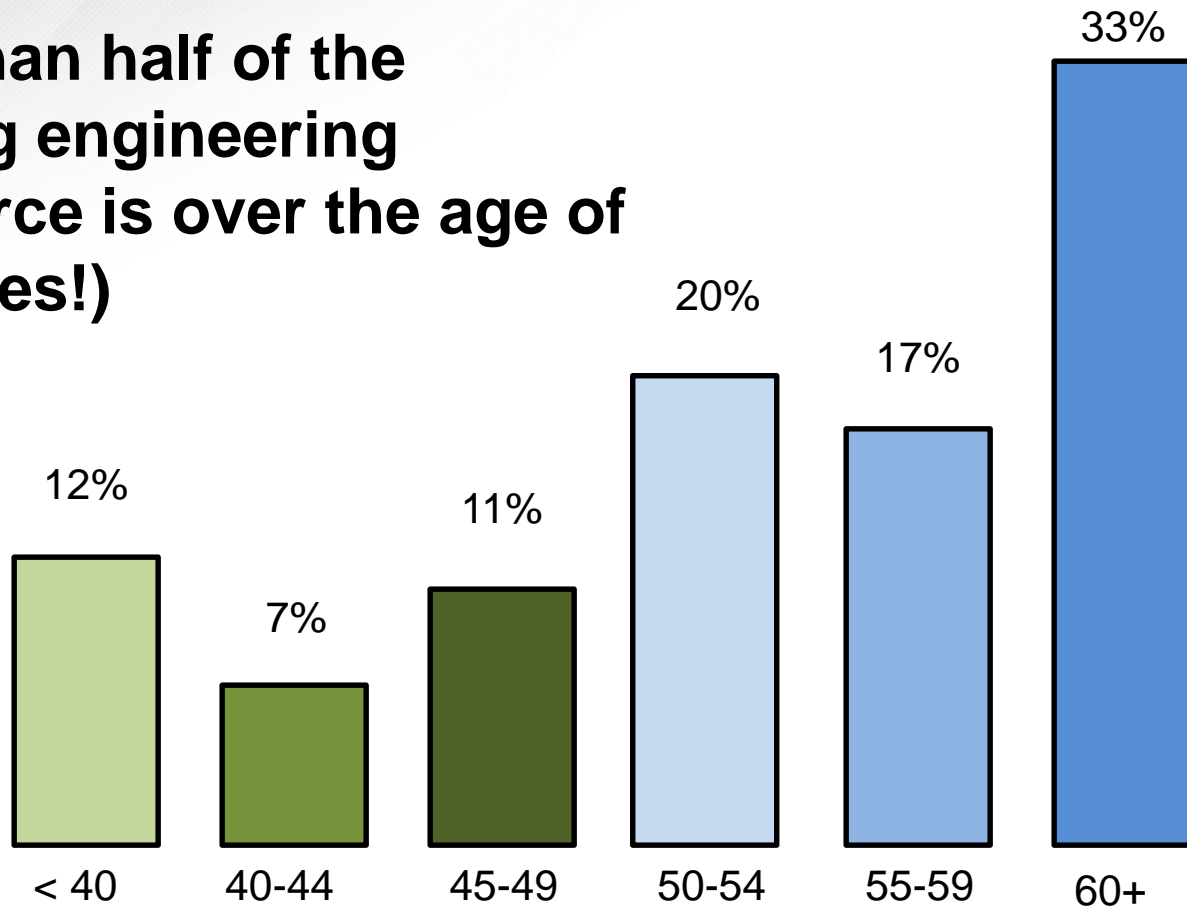
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**More than half of the
existing engineering
workforce is over the age of
55! (yikes!)**





Office of Science and Technology Policy



President's Council on
Science and Technology
Report to the President:

**1 million more
STEM degrees
needed in the next
decade**



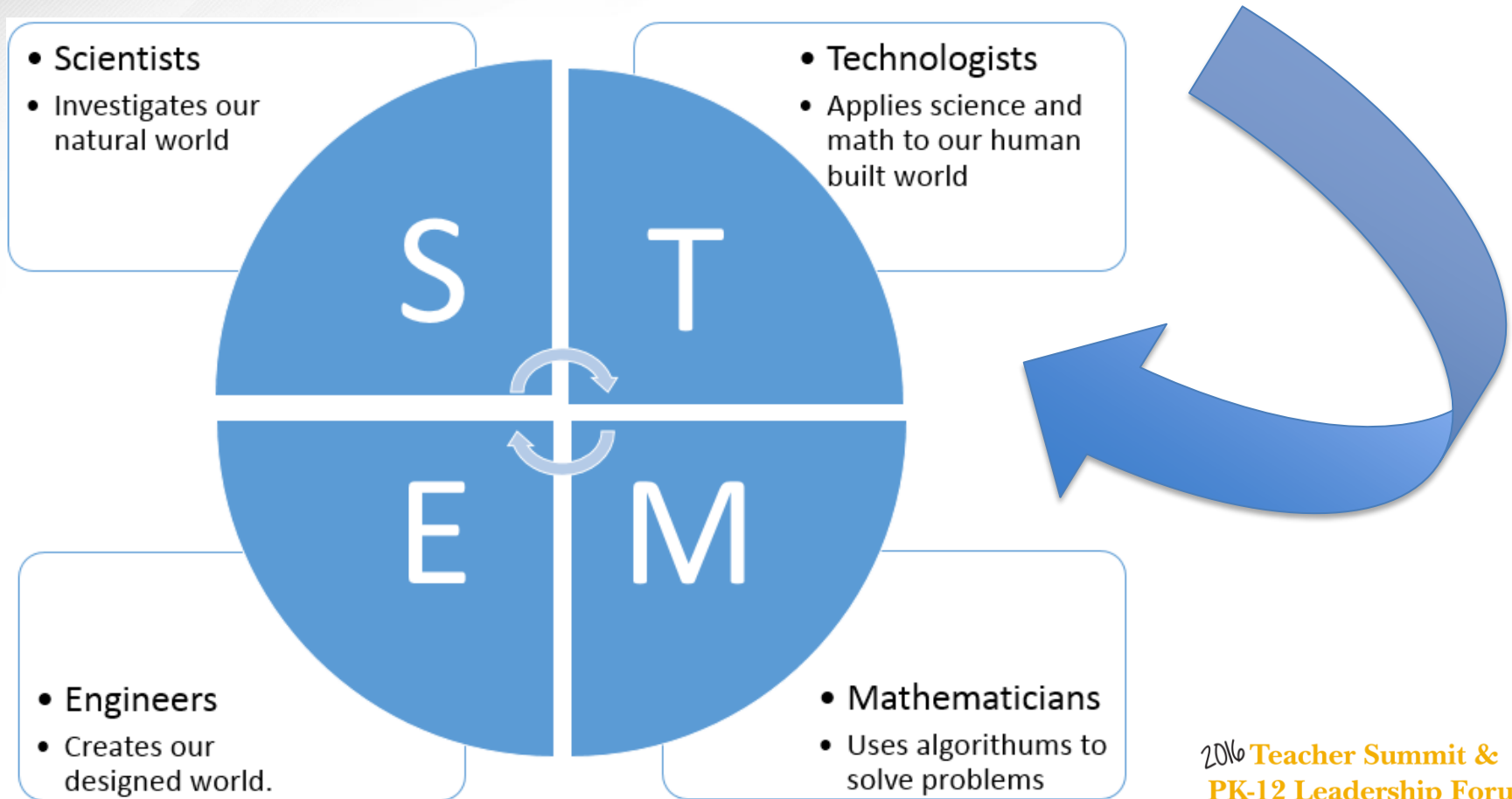
President's Council
on Jobs and
Competitiveness
"...goal to graduate
**10,000 more
engineering
students** from U.S.
colleges and universities
each year..."



Projected need for
engineers entering
the workforce in
Texas:

**62,000 more by
2022**

STEM – Working together to solve problems based on societal needs and wants



Is STEM *just* Engineering?

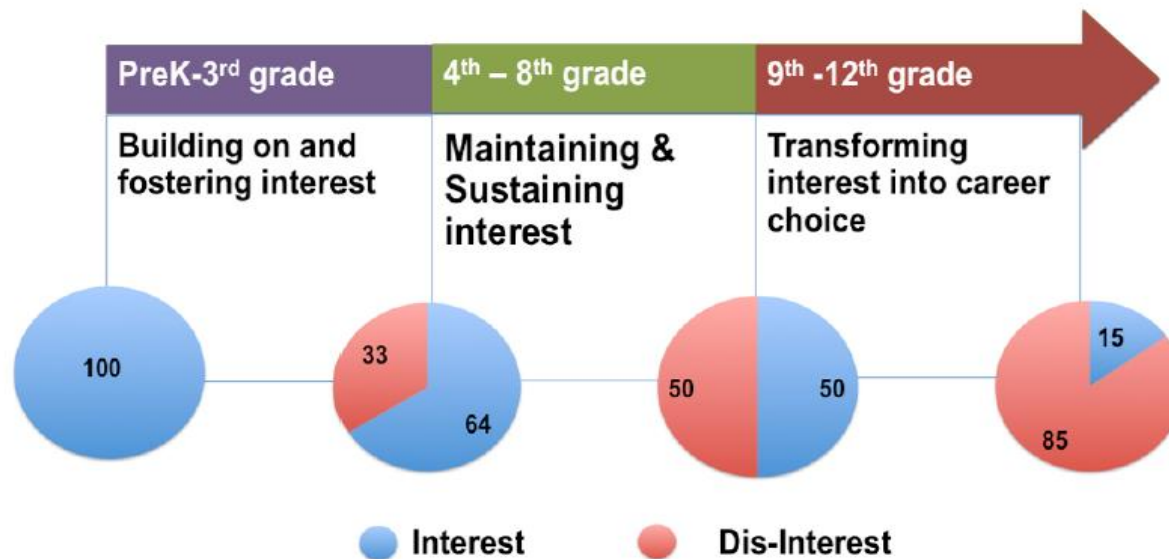
According to the U. S. Labor Department, the 10 fastest growing occupations) from 2008-2018, and their median wages are:

- Biomedical engineers, \$77,400
- Network systems and data communications analysts, \$71,100
- Home health aides, \$20,460
- Personal and home care aides, \$19,180
- Financial examiners, \$70,930
- Medical scientists, except epidemiologists, \$72,590
- Physician assistants, \$81,230
- Skin care specialists, \$28,730
- Biochemists and biophysicists, \$82,840
- Athletic trainers, \$39,640

And, arguably, all of these are STEM careers!

STEM – When do we start?

	Passive	Active
Dis-Interest	I don't know much about STEM (engineering), but I am certain I don't like it.	I engaged in STEM (engineering) and it is not for me.
Interest	Sounds interesting. Where I can find out more?	That was exciting. I want more of STEM (engineering)





PK-5

- <https://www.youtube.com/watch?v=jEiBf33RM3s>



Texas House Bill 5 STEM Endorsement

Name of Endorsement	STEM			
Pathway	Math	CTE	Computer Science	Science
General Requirements	Four math Four science Two elective	Four math Four science Two elective	Four math Four science Two elective	Four math Four science Two elective
Specific Requirements	Five (5) courses math (Algebra I, II, Geometry + 2)	Four courses (2 in cluster)	Four (4) courses from a wide variety of CS courses	Biology, Chemistry, Physics + 2 more credits



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What makes a great STEM program?

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The Curriculum

- Engaging
- Real-world, open ended problems
- “Supplies the formulas” not based on rote memory
- Creative
- Collaborative, but also corroborative

Support & Equipment

- Professional development that extends beyond your district
- Not just a room of “shiny stuff”
- Consumables
- Space
- Organization
- Time

The Teacher

- The essential key to ANY program
 - How resourceful are they?
 - Do they like to tinker, take risks, not afraid if they do not know all the answers. Can they facilitate not just deploy sit and get?
 - Are they an ambassador?
 - Can they transfer the knowledge?
 - Can they help others find their inner courage?



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STEM's Big Secret

Changed
Teachers

Changed
Students

Changed
World!

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What's New in the PK-12 Office

- Me
- Better communication
- Sustaining existing programs
- Determining the state's need for support and creating partnerships to help train teacher's and student's for the future



25
BY 25



TRANSFORMING ENGINEERING EDUCATION

**CONTROLLED ENROLLMENT GROWTH
WITH EXCELLENCE**

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Ideas?

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On your phone...

<https://kahoot.it/#/>

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