

**TOPIC: Mechanical Engineering**

Welcome back to school! In this issue, you'll find the tools to help your students explore...assess...and experience engineering! From an inspiring story about Sara Depaula and her quest to become a mechanical engineer to a fun hands-on activity where momentum and collisions help bring mechanical engineering to life, you will experience first-hand how engineering is all around you. Enjoy!

EXPLORE...

Find your dream job, meet extreme engineers, watch videos

What Do Engineers Do?**Mechanical engineers make a difference in the world by...**

- Designing and optimizing the sporting equipment and/or facilities athletes use.
- Using powerful super-computers to study the aerodynamics of solar-powered automobiles.
- Manufacturing ultrasonic devices that deter whales, dolphins, and seals from swimming into fishing nets.
- Designing more resource-efficient and recyclable products that help improve the environment.
- Creating ultra-miniature machines and tiny implantable medical devices that navigate the human body searching for disease and damaged tissue.

There's a Job in Engineering for You

Feel the Need for Speed? Design racecars as a mechanical engineer.

Like sports? Design golf clubs as a mechanical/sports engineer.

Mechanical engineers are responsible for virtually everything you see or use during the course of your day. In fact, if something moves or uses energy, a mechanical engineer was probably involved in its design or production. The advancements made by mechanical engineers range from lifesaving medical devices, athletic equipment, and personal computers to air conditioners, automobile engines, and electric power generation plants. Not to mention mechanical engineers also design the machines that produce these products.

Did you know?

Engineers are some of NASCAR's hottest hires. In a field where .10 second is the difference between winning and losing, people who can interpret math equations, computer codes, and research data; run simulation and test systems; and communicate it to the driver, crew chief, track personnel are definitely in demand. That is just the beginning. Not to mention, that engineers must have a strong understanding of aerodynamics and engine technology. Engineering is a fast paced, ever changing field. Can you keep up? Mechanical engineering can take you anywhere... you can create the most aerodynamic and fuel efficient NASCAR, or you can drive one and compete in NASCAR races such as Ryan Newman and Ashton Lewis, both are NASCAR drivers and both have mechanical engineering degrees.

Salary

The average starting Salary for a Mechanical Engineer (2007):

B.S. degree	M.S. degree	Ph.D.
\$54,128	\$62,798	\$72,763

More to Explore

Check out the complete mechanical engineering *What Do Engineers Do* webpage at <http://www.jets.org/explore/what/mechanical.cfm>.

Extreme Engineer: Sara Depaula



Sara with her daughter

Extreme Engineer Quote

Participate in programs and competitions [like JETS] that expose you to what engineers do and help you explore engineering

What She Does

Sara resides currently in the Denver Colorado area where she works for the US DOT - Pipeline and Hazardous Material Safety Administration. Sara works to understand the current state of pipeline safety regulations and then provides tools and recommendations to aide in assessing risks that effect the general population.

Making a Difference

Sara enjoys being an important part of a team that makes improvements that will ultimately make differences that effect the general population and the way we live. She typically works about forty hours per week and she loves that every day is different than the last one.

Why Engineering?

While in high school, she participated in the FIRST Robotics engineering competition and said that the experience is what inspired her to pursue engineering. Being a part of the entire process from conception to prototype was an enlightening experience for her and that's what she loved about it right away.

Advice

Participate in programs and competitions [like JETS] that expose you to what engineers do and help you explore engineering. Additionally, Sara has had many role models to include past teachers, supervisors, colleagues and especially her five year old daughter Emily. Sara noted that you should expose yourself to a lot of diverse opportunities as you are in the career exploration process because you never know what life changing experience is just around the corner.

Hobbies/Free Time

Sara enjoys extensive traveling abroad and has even had time to train and run her first Marathon last December! Recently though, Sara has been focusing on spending as much time as possible with her daughter Emily. See...you can have a great job you love and enjoy your hobbies and family, too!

Education

Sara attended high school at Maritime & Science Technology High School in Key Biscayne, Florida. After high school Sara began college at Florida State University and declared her major in Mechanical Engineering. She ended up finishing her degree at Florida International University. While in college, Sara became very active in the FIU section of the American Society of Mechanical Engineers (ASME) and said "The entire experience was a lot of fun because it was challenging and it allowed me to meet others in the same career path."

More to Explore (meet JETS Affiliates)



ASSESS...

Find your strengths, prepare for the future

Coming soon: PathAssess... only from JETS

PathAssess is an online tool aligning students' interests with careers in engineering. Based on the Holland Theory of Vocational Interest and Lent's Social Cognitive Career Theory, students will receive a customized profile relating their interests to engineering careers they may wish to pursue.

EXPERIENCE...

Get active and unlock the mysteries of engineering

Hand-On Activity



Mechanical Engineering

Bouncing Balls: Grade Level: 10 (9-11)

Group Size: 3

Time Required: 45 minutes

This month's activity provides a means for teaching **momentum** and **collisions** in the context of [sports engineering](#). In the TeachEngineering activity, [Bouncing Balls](#), students examine how different balls react when colliding with different surfaces. They will also learn how to calculate momentum and understand the principle of conservation of momentum in the context of sports engineering. Sports engineering is becoming a popular specialty field of study. While some engineers dedicate their research to understanding collisions between balls and bats, others study the effects of a golf ball colliding with the head of a golf club. To design these aspects of sports equipment, a student needs a firm background in [mechanical engineering](#) and [materials science](#) to understand **materials** and **dynamics**.

Bouncing Balls Activity URL:

http://teachengineering.org/view_activity.php?url=http://www.teachengineering.com/collection/cub_/activities/cub_energy/cub_energy_lesson03_activity3.xml

JETS Challenge



Each Friday JETS posts a new challenge question. Use these challenges to warm up for TEAMS or NEDC competition, in your classroom for extra credit, or at an engineering club meeting.

Challenge 105 — The Hershey's Kiss Takes Flight!

July 1, 2007 was the 100th anniversary of the first Hershey's Kiss! Today, the company makes 80 million of these tasty treats each DAY! Each Kiss is wrapped in 6.35 cm^2 of aluminum foil that is 0.00153 cm thick. The density (mass per cubic meter) of aluminum is 2700 kg/m^3 .

A Boeing 777 is one of the most efficient passenger aircraft ever built. The maximum gross takeoff weight is 299,370 kg, which includes 171,170 liters of jet fuel at 0.762 kg/liter . About 70% of its remaining mass is made of aluminum.

The Challenge: How many days of production of Hersey Kiss wrappers are required to equal the mass of the aluminum needed to make a Boeing 777?

Submitting Answers to JETS

E-mail your answer to JETS at challenge@jets.org and enter 'Challenge xx' in the subject line. NOTE: Only those submissions with 'Challenge 84' (enter the actual week's challenge number) in the subject line will be considered for the monthly drawing.

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