

**WPAFB
Educational
Outreach Office**

W.O.W! Words

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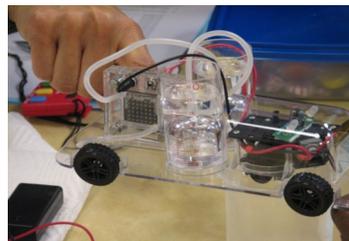
Special points of interest:

- Looking for a GREAT resource? Tune into LabTV
- Fuel Cell Demonstration ready for scheduling
- Summer Opportunities for teachers and students
- Next Newsletter—May 1, 2010

TechFest 2010 Highlights—

The 8th annual TechFest was a resounding success! With 70 exhibits and 33 presentations, the Affiliate Societies Council's goal was met. Committed to opening the world of STEM to area students, TechFest did just that...2,539 youths were registered over the 2-day event. Since the registration did not include parents or other adults, the council estimated that 4,000 people attended the event held Saturday, February 13 and Sunday, February 14th.

In addition to the exhibit area, forty area teachers took advantage of the fun-filled day at TechFest 2010. Designed to give grade level teachers the opportunity to expand their STEM awareness, eight break-out sessions were offered.



One session sponsored by WPAFB Education Outreach featured fuel cell technology. The fuel cell workshop allowed teachers to explore the exciting physics of energy and the possibility of hydrogen fuel as an alternative fuel source. Hydrogen can be safely

produced, stored and delivered making it an ideal green fuel. Through the process of electrolysis, teachers generated hydrogen that powered their fuel cell cars. Teachers took home basic, intermediate, and advanced lessons to use in their classrooms.



TechFest 2010 participants enjoying the 70 exhibits on display in Building 12—Sinclair Community College

Grab Your Hat and Read With a Cat!

Read Across America Day, NEA's national reading celebration takes place each year on or near March 2nd, the birthday of Dr. Seuss.

Locally, the annual event is hosted by the National Museum of the Air Force and supported by the WPAFB Edu-

cation Outreach office. Read Across American was held Thursday, February 25 and Friday, February 26, 2010. With 48 schools in attendance, students and teachers alike enjoyed the morning of reading. Many WPAFB personnel volunteered to be part of the Seuss celebration.



Wizard Spotlight— Charlie Tyler

Have you ever seen a tall man sporting a wizard hat and “listening ears”? If you answered yes to this question you are among the fortunate to have seen Charlie Tyler in action!

This “wizard extraordinaire” specializes in many W.O.W! areas. He performs aerodynamics, bridges, bubbles, laser and optics demonstrations for numerous schools and community groups.

Charlie is a regular guest speaker at STARBASE, inspiring 5th graders with his use of humor and love for learning. Since STARBASE's inception, Charlie has been instrumental in orchestrating the aero career speakers. He developed the briefing, provided the equipment, and initially trains the group of aero volunteers.

Besides the many volunteer hours Charlie graciously donates to the WPAFB Education Outreach Office, he finds time to actively participate with his own children's organizations—Northmont sports, Boy Scouts, and Girl Scouts.

This time of year, Charlie is known as the “Northmont Cookie Monster”. He manages several deliveries to the troop cookie-captains. His monstrous duties

include troop computer account organization as well as, housing the countless cases of cookies for his own troop.

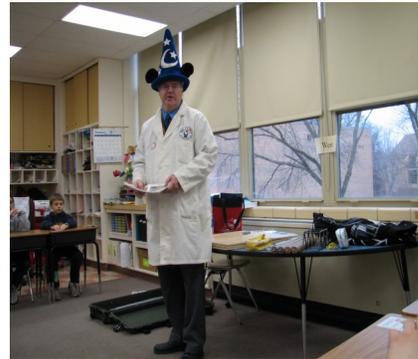
Charlie Tyler's educational background is impressive. Attending the University of Dayton he earned his Bachelor's degree in Mechanical Engineering, his Master's, and Ph.D. in Aerospace Engineering. He later followed up with a MBA from Wright State University.

Anyone who knows Charlie, aka “Dr. Spider-man”, can tell you his favorite superhero is Spider-man. Charlie has been collecting Spider-man/Marvel comics and associated paraphernalia for over 33 years. He has well over 15,000 comic books in his collection.

Why Spider-man? According to Charlie, the answer lies with a comic book. Charlie shared that he was an elementary school student who hated to read and was failing science until he received

a gift of a comic book, featuring the infamous Peter Parker...you know the story.

This is all it took for Charlie to become an avid reader, a life-long learner, and an aerospace engineer working for one of the world's most prestigious research laboratories—AFRL!



Charlie Tyler at St. Albert the Great

Whether it's hiking through the woods, spinning records as a DJ, making culinary creations like Boy Scout subs, or supervising the unloading of scrap booking supplies...

Charlie Tyler gives 110% of himself! The WPAFB Education Outreach office is most fortunate to have such a dedicated volunteer who shares his

passion of science with others!

Wiz Stuff

Teachers! Here is another wonderful resource ...The American Institute of Aeronautics and Astronautics (AIAA).

Team up with AIAA to reenergize imagination in the classroom and renew

interest in scientific and technological discovery and research. Understanding the importance of a good education in math, science, and technology, AIAA is offering FREE teacher membership for K-12 educators!



As an AIAA Educator Associate you will receive numerous benefits: grants, recognition through educator awards, resources, training, and field trips.

More information can be found by visiting www.aiaa.org

Upcoming events—Spring Job shadow Day

High School Teachers please share with your students—

Job Shadow 2010 is just weeks away! Sixty high school juniors and seniors will have the opportunity to shadow Wright-Patterson Air Force Base professionals Wednesday, March 24th. WPAFB Job Shadow is offered twice a year to enrich the lives of students by offering them on-the-job experiences. The 8:00 AM –2:00 PM day invites students to see firsthand how the skills

learned in school are applied in the workplace. This year's career areas include:

Acquisitions, Aeronautical Engineering, Computer Technology, Finance, Fire Fighters, Mechanical Engineering, Medical, Meteorology, Physics, Public Affairs, STEM, and Tax Preparation.

Remember that pre-registration is required. Those interested should visit our website for registration forms and

additional information. We are limited to 60 participants. Slots will be filled on a first-come, first served basis. The deadline for registration is midnight, March 10, 2010.

If you have any questions or need assistance, please call 255-0068 or email

krista.gerhardt@wpafb.af.mil

What's New? - Summer Workshops

For Teachers

Air Force Association Teachers' Workshop Saturday, April 17, 2010—This free, one day workshop offers educators a selection of sessions, lunch, and CEU! More information can be found at <http://afaspringworkshop.eventbrite.com>

Registration closes Tuesday, April 13th.

ASM Materials Camp 2010—July 19-23, 2010—This free, one-week workshop shows teachers how to integrate low cost/no cost, simple labs and experiments using everyday materials into your existing lessons.

Visit www.asmfoundation.org for more information.

For Students

For students in grades 7-11, The Ohio State Pre-College Engineering Summer Camp is offering summer camp opportunities. Applications are now available for all of the following pre-college summer programs offered by the Ohio State Women in Engineering Program:

Grade 7: WiE GROW—females only
<http://wie.osu.edu/content/wie-grow>

Formally known as the Future Engineers' Summer Camp, WiE GROW is a day-camp for young women who are going into grade 8 in the fall. WiE GROW 2010 will run from August 9-13. This program is sponsored by the Scotts Miracle-Gro Company.

Grade 8: WiE CHEER (CHEmical Engineering Rocks!) - females only

<http://wie.osu.edu/content/wie-cheer>

Formerly known as the CheME & YOU @OSU Summer Camp, WiE CHEER is a

six-day, residential summer program for young women who are going into grade 9. Dates include June 27-July 2.

Grade 9- 10: WiE RACE (Reaching A Career in Engineering)

<http://wie.osu.edu/content/wie-race>

Formally known as the Engineers in Motion Summer Camp, WiE RACE is a six-day, residential summer program for high school students. Dates include July 11-16.

Grade 11: WiE RISE (Respected, Involved, Skilled, Empowered) - females

<http://wie.osu.edu/content/wie-rise>

WiE RISE is a brand new six-day, residential summer program for high school students that will be a seniors in the fall. Dates include July 25-30.

Applications can be found at the individually listed websties.

Today's Classroom - Tomorrow's Future

Inspire the next generation of engineers with the latest tools. Give students the right tools and see what they create...

The WPAFB Education Outreach office commits itself to providing teachers with the resources necessary to inspire students to pursue STEM-related ca-

Flying Cars. Bionic Eyes. Smog-Eating Cement. What will engineers think of next!?!

reers. One of those resources is *Engineering, Go For It!* This is a totally interactive site dedicated to the exciting world of engineering .

www.egfi-kl2.org

Sponsored by the National Defense Education Program, teachers and students can discover new inventions, explore the different fields of engineering, and meet real engineers.

The U.S. needs more people to work on technical solutions to secure our country's future. Scientists and engineers are in high demand. The National Defense Education Program encourages you to consider a future career with the Department of Defense.

Learn more at www.ndep.us

LabTV—Brainwaves

As highlighted in January's *WOW! Words*, the National Defense Education Program (NDEP) showcases Department of Defense scientists and engineers performing their everyday duties and research in military facilities across the country.

After previewing the action-packed episode of *Brainwaves*, teachers can use this short 3-minute snippet of information to enhance their life science curriculum. Designed to capture the students' attention, this episode fea-

tures footage of Air Force pilots in action. Filmed here at Wright-Patt, students can see WPAFB biomedical engineers using modern technology to read pilot's brainwaves when facing routine duties such as, take-off and landing of their plane. Understanding the complexity of the human brain and flight performance is one of the many objectives of the human performance aspect of the United States Air Force.

In addition to episodes featuring

Wright-Patterson's Research labs we plan to include Brooks Air Force Base in Texas. As we here in the WPAFB Education Outreach office welcome the talented men and women from Brooks to the 711th Human Performance Wing.

Check out www.labtvonline.org for video stories about exciting careers in our nation's defense labs.

Next issue—*Carbon Nanopearls*



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Our Mission: *To facilitate partnerships with the K-12 educational community to increase student awareness and excitement in all areas of science, technology, engineering and math (STEM) and related careers!*

Wright-Patterson Air Force Base, near Dayton, Ohio is one the nation's most important military installations. The base is headquarters for a vast, worldwide logistics system and is the foremost research and development center in the U.S. Air Force. Steeped in tradition, WPAFB has been a leader in military aviation development from the time of airplane inventors Wilbur and Orville Wright, who lived in Dayton, to today's aerospace age.

The Wright-Patterson AFB Educational Outreach Office was established in 1999 to share the base history, experience and capabilities with the K-12 educational community through internal programs, partnerships and individual involvement.

It is the only program of its kind within the Department of Defense!

D.I.Y (do it yourself) Science— Krista Gerhardt

Recall the days of purple tinted dittos, damp with duplicating fluid, and the smell...ah, the ditto machine! The year 1989, I first witnessed this demonstration by the hands of my supervising teacher, mentor, and friend—Mr. Bob Colvin.

Using the empty and clean metal can from the duplicating fluid, Bob heated the can that contained a small amount of water. Upon visible signs of boiling, he sealed the can. He quickly inverted the closed, heated system into a vat of water, the can collapsed—crushing itself beyond any resemblance of its original shape. Mr. Colvin quickly captivated his audience of inner-city middle-students, also his wide-eyed student teacher.

Remembering this wonderful illustration of **air pressure**, I utilized the same principle many years later...

As in many classrooms, students' rate of work varies. Challenged by a few students that always finished class work quickly, I utilized cabinet drawers in my classroom for D.I.Y. Science. Each drawer, contained the necessary science equipment, materials, and laminated instructions to perform quick and easy science activities. This activity provided enrichment for any student that had completed their work or mastered the concepts when the majority of the class needed additional review.

The DIY drawer required a minimal amount of

materials: empty 12 ounce aluminum pop can, hot plate, tongs, a large container to hold water, and the laminated instructions.

1. Add water to the pop can so that the bottom of the can is just covered.
2. Place the can on the hot plate and allow



the water to boil.

3. When water vapor can be seen coming out of the can, use the tongs to pick it up. Quickly, turn the can upside down and dip it into the container of water.

What happened to the can?

What caused that to happen to the can?

Before the addition of the water to the can, the can contained air. When water was added some of the air was displaced. Heating the water caused it to boil and the resulting water vapor expanded inside the can, pushing most of the remaining air out of the can. When the can was cooled in the water, the water vapor changed to liquid water, which took up much less space than gas. This change took place while the opening of the can was under water, so no air was able to rush into the can. The pressure inside the can was therefore much less than the pressure on the outside of the can, and the can imploded.

Additional DIY drawer materials included a follow-up worksheet reinforcing the science concept of air pressure.

Next issue—Happy Crabs