

**Le Stimulateur-Nouvelles du programme d'ingénierie
Stimulons la pensée.**

STEMulator – News from the Engineering Program Stimulating higher thinking skills

Turning Dreams Into Reality: Engineers Week 2012

Can not wait for Engineers Week 2012?

Go to:

www.eweek.org

For your reading interest this month:

- **900 People. 900 Dreams**
- Family Day at National Building Museum
- Engineering Per Grade Levels
- School Wide Engineering: Specialists
- Engineering and Sports

Engineers Week celebrates the positive contributions engineers make to society and is a catalyst for outreach across the country to kids and adults alike. Considering the projected world population of 7,000,000,000, there are many challenges facing our world that require immediate engineering solutions.

On February 22, 23 and 24, Kent Gardens will celebrate 900 students, 900 dreams, 900 chances to turn dreams into reality. Thanks to the staff and thanks to the community members who have volunteered to share their experience and their expertise with the children, Kent Gardens students will enjoy a variety of engineering experiences. Once again, thank you for everything you do in support of our students' STEM program!!

Waiting for the school celebration, we would like to draw your attention on Discover Engineering Family Day (February 18), and Introduce a Girl to Engineering Day (February 23). Enjoy!



7 billion people. 7 billion dreams. 7 billion chances for engineers to turn dreams into reality. The theme of National Engineers Week for 2012 is based on the projected world population of 7,000,000,000.

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Discover Engineering Family Day

We are so fortunate to have so many wonderful family STEM activities in our area. On Saturday February 18, the National Building Museum will be hosting their annual Discover Engineering Family Day. It will be held from 10:00 am– 4:30 pm. There you will find over 20 hands-on activities provided by local engineers and national organizations. Exhibitors will include the following organizations: The National Science Foundation, Family Magazine, Society of Hispanic Professional Engineers, The Children's Science Center, the American Helicopter Society and more. Children of all ages are invited to enjoy the excitement of engineering by using gumdrops, toothpicks, and

slime! There will also be characters and actors from popular engineering and science TV shows. For more information, check out their website at <http://eweekdcfamilyday.org/index.html>. This sounds like a fun STEM activity!



Kindergarten Students Learn About “Going Green”

Our kindergarten engineers are getting ready for engineering week in February. The kindergarten classes will be using legos and different materials to build a neighborhood that is “going green.” We will be incorporating our science unit of recycling into our engineering unit. The students will work together to build a

neighborhood that is “going green.” We will use the engineering design process when creating our neighborhood. The students will go through the five steps; ask, imagine, plan, create and improve to create a neighborhood that includes houses that are “going green” in at least one way.



Our kindergarten engineers continue to build structures in the “building/engineering” center and enjoy working together to do so. We have noticed that the understanding of engineering principles discussed when building collaboratively has transferred to the engineering center and mega think time.



First Graders Will Visit the National Building Museum

In January, first graders finished their engineering adventure, based on the book The Little House by Virginia Burton. After reading the book, they put their problem-solving skills to work, teaming up to design a house that moved between three backgrounds – three time periods in the life of the little house. Some chose to have the back-

ground move instead. Regardless, of how they chose to do it, they loved the hands-on engineering!

This month, first graders have begun to study various animal habitats in anticipation of Engineers’ Week. They will design and build an assortment of animal habitats to be showcased in the First

Grade Zoo in early March. The animal habitats will include an assortment of animals from around the world.

Also as part of Engineers’ Week, first graders will take a field trip to the National Building Museum in Washington, D.C. There, they will take part in a hands-on program called “My House, My Home”. Check back next month to learn more about it!

Amazing Creations Made in Think Tank!

Kent Gardens Engineers use the Engineering Design Process (EDP) to create new lunch boxes and design kinetic sculpture.



Second Graders Will Design A Dutch Village

This month, second graders will study how to use wind energy to meet the needs of a town. Students will become mechanical engineers and use math connections to design their Dutch village. Each class is going to design a windmill that will be used to perform some need for the village. The students will be doing research and discussing how windmills can be used to sustain a village.

In addition, the 2nd grade students will participate in a program at The National Building Museum called “City by Design” where they will become city planners for the day as they design their own model city. They will need to consider the issues a city may face such as traffic, overcrowding, and access to public transportation and services. They will use planning to solve some of these complex issues and provide the necessities of living to the imaginary people in

their community. As a class, students will decide which buildings their city will need as they stretch their imaginations to design and construct model buildings for the city, using colorful supplies and recycled materials. The students will utilize what they learn at the National Building Museum and incorporate those findings into our engineering showcase project. We look forward to seeing all of our 2nd grade parents at our showcase on the evening of March 6.

Third Graders Created Water Turbines



After briefly touching on renewable resources and how they can be harnessed to produce energy, Miss Mounce’s class wanted to delve deeper. So, as an extension project to the Fairfax County Earth Cycles unit, students created water turbines using the engineering design process. Either with a partner or a small group, they imagined how they could transform ordinary classroom objects such as duct tape, masking tape, paper, straws, popsicle sticks, and dowels into a small water turbine. Once they had imagined and planned, they worked

together to create, test, and improve their designs.

The most challenging part for most students proved to be finding a way to get the turbine not to run into their hands while it was being held under the running water! In the end, many students were successful in making a water turbine that turned under the power of the classroom faucet, but most importantly they all increased their knowledge of engineering as well as the effectiveness of renewable resources in energy production.

Fourth Graders Designed New “Spacesuits”

The 4th Grade classes have been having a blast with engineering so far this year! We thoroughly enjoyed the E-Pod challenge of designing “spacesuits” that would protect astronauts from asteroid impacts. In the classrooms, our students are working to model magnetic levitation transportation systems, such as those used by the high-speed trains in Japan.

In Think Tank, students are free to choose or design their own challenges and are actively creating new inventions, such as

shoes that can be worn for work and play, boats that will carry weights across Think Tank Pond, and new lunchboxes that will hold a nutritious snack and drink.

We are eagerly looking forward to Engineers Week beginning February 22nd, and we are busy working on our student projects, which we will share with our families on March 12th. (Any 4th grade parents who would like to present during Engineers Week, please email Ann Rajabi at arajabi@fcps.edu.)



Fifth Grade Students Will Design Water Filters

The fifth graders are eager to start their Engineering is Elementary Unit, called Designing Water Filters, the first week in February. This unit will take the students through the Engineering Design Process to find a solution for polluted water. It correlates very well with many science and math concepts in fifth grade, including the Landforms Unit, the Oceans Unit, the Micro to Macro Unit, and concepts

related to decimal computation. The unit, along with all Engineering is Elementary units, also starts with a book to read aloud, so the students use various reading strategies during this time.

The students will have the opportunity to hear about the affect of water pollution on organisms, in particular, the organisms living in the polluted Ganges River in India. They will design a water filter to try

and clean the visible particles in pretend polluted water. We would also like to give the students the opportunity to try their filters out on local polluted water.

Through this experience, we hope the students build an understanding of the Engineering Design Process, as well as the effects that pollution has on water organisms.

Sixth Graders Will Create A Rocket Design

Sixth graders have finished testing their parachutes! Our parachutes had to meet two criteria: (1) The parachute may not take up too much space. (2) The drop speed of the parachute must be 5 ft. (1.5m) per second or slower. Ask your child how their parachutes performed in the trials and how they would improve the design. Using our background knowledge of the Engineering Design Process the sixth graders are going to be tasked to create a group rocket that is able to propel. The students

will continue to use the design process in order to help them along the way. This activity provides an opportunity to imagine, plan, and create a rocket design.

As a class, we will brainstorm materials that can be found around the house to help them construct the rocket. Groups will brainstorm needed materials and divide up the responsibilities to bring them to school. Mr. Crowell &

Mr. Cowles would ask that students not purchase materials but instead look for creative ways to incorporate items from home or ask us if we have items they are needed. Students will imagine the design and work cooperatively in their groups to decide a final plan to build. The groups will have time during class to work on their designs. The testing of the rockets will be much anticipated as students will reveal their designs. We look forward to showcasing your children's designs in March.

AAP and Engineering

It has been very exciting to see the children engaged in the new Think Tank challenges. The higher levels of thinking skills are hard at work. The amazing thing is that so many of the children start out with an idea based on a challenge and then they take off with their own ideas and create something much different and more inventive.

One of the most popular challenges in Think Tank has been Kinetic Sculpture,

where children are asked to use copper wire and form shapes to create an original sculpture that has two moveable parts. We have some budding Calders! Another favorite challenge has been creating a new and never before seen lunchbox. Some of the materials that the children get to use are bubble wrap, paper bowls, yarn, and cardstock. Take a look at some of the creative engineering being done in Think Tank using your recyclables.



Our students enjoy the Kinetic Sculpture challenge in Think Tank!

Fantastic Windmills Created by Our 2nd Grade Engineers!



Engineering in the Media Center - Roman Engineering



Ancient Roman Aqueducts are still used today.

It is not known when or where the first aqueducts were built. The city of Rome had many aqueducts and was the only ancient city reasonably supplied with water. The first person in charge of the Roman waterworks was Marcus Agrippa, who was appointed water commissioner in 33 B.C. By A.D. 97, nine aqueducts brought about 85 million gallons of water a day from mountain springs. Later, five additional aqueducts were built. About 200 cities in the Roman colonies had aqueducts. One

famous Roman aqueduct, the Pont du Gard, still stands across a river near Nîmes, France. Roman engineering feats served as models for later engineers.

Some of the roads, bridges, and aqueducts built by the Romans are still used today. The Romans demonstrated the importance of swift and reliable water sources to meet the demands of the population.

Bix, Amy Sue. "Aqueduct." *World Book Student*. World Book, 2012. Web. 2 Feb. 2012.

A New Website Called NBC Learn - Boyer's Word

NBC has launched a new website called NBC Learn. On the site, <http://www.nbclearn.com> there are many resources and educational videos. Of course, Miss Boyer's favorite section is the "Science of NHL Hockey". In that section, the topics include vectors, reflexes & reaction time, kinematics, projectile motion, and force, impulse & collisions.

As a football fan too, Miss Boyer also likes the section of the website

about the "Science of NFL Football".

This section has information about Newton's laws of motion, nutrition, hydration & health, geometric shapes and the Pythagorean Theorem. This website is a wonderful way for students interested in football and hockey to see how much math and science are involved in these sports.

The NBC Learn site also has sections about the "Science of the Olympic Games", "Finishing the Dream" (about

the civil rights movement), "Chemistry Now" (shows how chemistry works in everyday life), and "Changing Planet" (about climate change). Visit the website today!



Engineering in the Art Studio

Parachutes and Engineering

Parachutes function as emergency lifesaving devices, to drop supplies and assist in slowing down the speed of a falling object, equipment or people. Food and medical supplies are dropped by parachutes to areas that were affected by disasters. Parachutes are also used to drop heavy equipment or survival equipment in air-sea rescue operations. High speed airplanes are known to use parachutes to slow them down during landing. Parachutes are also used for recreation or as a sport. Many companies at beach resorts provide parachuting as a tourist attraction.

Parachutes are considered "deceleration" devices. Deceleration means "to slow down". Things to consider when designing a parachute: gravity, air resistance, laws of falling bodies, acceleration, deceleration, friction, and weather patterns. The students in fourth grade art are creating and designing parachutes as engineers that transport humans to a surprise location. They are incorporating the different parts of a parachute that enable them to be functional.

