Inside this edition:

President’s Message          Page 1
Learn to Think Like an Engineer          Page 2
Award Winning Teachers          Page 4
Design Brief to Try          Page 5
Timing is Everything          Page 6
What a Teacher Needs Most          Page 7
Convention Highlights          Page 10
President’s Message

Dr. Laguna O. Foster

Many are called! But few are chosen!

*Children’s Engineering is growing and in need of ambassadors and leadership to further the cause!*

Over the past few years, the interest and implementation of Children’s Engineering has never been greater. With so much at stake, leadership, especially in Science, Technology, Engineering and Mathematics (STEM) is a necessity. National wide, school divisions are struggling to identify knowledgeable individuals to lead the charge for growth in the STEM disciplines. Are you that person?

Once again I am honored to serve for a second term as President of the Children’s Engineering Council. I have witnessed your interest in our goals and mission and personally thank you for joining me in creating opportunities for our children and the individuals who educate them.

Last year, my goals were:

- To increase opportunities for children and teachers to explore engineering and technology.
- To establish and sustain partnerships among businesses/corporations, higher education institutions, school systems, civic/professional organizations, government agencies and other entities committed to our cause.
- To support educational improvements in engineering, science, technology and mathematics.

I am proud to share that these goals have been met and will continue to grow under the leadership of our new incoming president-elect, Dr. Arthur Bowman. Please join me in congratulating and welcoming him!

Let us continue to expose our children at early ages to the variety of experiences needed to be successful contributors in society. These experiences must continue to be aimed at improving their academic skills, especially in design, engineering and technology.

Sincerely,

*Dr. Laguna O. Foster*

*VCEC President*
My 3 teammates and I teach in a STEM Academy within our school, Pocahontas Elementary in Powhatan, Virginia. We teach 96 children in second, third and fourth grade. We use block scheduling and departmentalization in our STEM Academy. We chose this way of scheduling to give us large blocks of time to incorporate the engineering design process as a teaching strategy. The children have 2 two-hour blocks a day. They have mathematics and science in one day, alternating with literacy and social studies the next day, Monday through Thursday. On Friday, the students go to all four classes, for one-hour blocks. Although we employ departmentalization, we do integrate the subjects. Writing is the responsibility of all four core teachers, as we all believe strongly that teaching children to be effective writers in all content areas is critical. Reading is used in all of the content areas, and mathematics is used in science on a daily basis. Our ultimate goal in integrating the subjects is to have the children make connections in their learning, regardless of the subject they are doing. Engineering concepts are taught and used throughout our curriculum.

Engineering, of course, is the E in STEM. As we assert in our STEM Academy mission statement, we are “dedicated to creating a hands-on, inquiry-based learning environment which offers the opportunity to design and construct solutions for problems throughout the curriculum. Students will work together to become self-confident problem solvers and decision-makers to help prepare them for today’s rapidly changing world.” This is why we do what we do! We want to make sure our children are prepared for a world where technology evolves and they need to constantly learn, problem solve and change to meet continually changing careers. The engineering design process is the way to realize this mission!

In education, we have many demands, and many resist using engineering because it is seen as one more thing to try to fit in. Engineering is not an add-on to the curriculum. It is a strategy for teaching; how the curriculum is presented. We began by spending worthwhile time teaching our students the design process. As we did units of study in our content areas, the children showed what they had learned by going through the design process. For example, when we studied adaptations in animals, the students designed and created a model animal that had adaptations to live in a given habitat. In their reading groups, the students designed and created projects to show the setting, characters, and plots of their stories. While learning about Ancient Egypt, the students created their own sarcophagus to represent their lives.

Continued on page 3
Over time, we learned that the engineering process could be (and should be!) incorporated into almost everything we do. The coat area was out of control in the colder weather with all our extra coats. A quick problem solving session resulted in a redesign of how students put their things away. They decided on the design, and it worked for them. This is the result of engineering. As we assign learning tasks in class, the students are now THINKING LIKE ENGINEERS! They actually ask, “What is our criterion for this?” As they, and we, learn to think like engineers, we become confident and effective problem solvers across the curriculum.

Engineering design is a problem solving process that is learned over time, for both the teachers and the students. We all become better communicators, better problem solvers, and better decision makers. We also all learn that some attempts are not successful; however, it is these same failed attempts that lead us to the greatest successes. Give engineering a try. Start small and incorporate more as both you and your students become more confident. You will never regret learning to think like an engineer!

The Engineering Process

- Redesign
- Understand the Problem
- Brainstorm Solutions
- Design and Create
- Test and Evaluate Your Solution
Congratulations to Ms. Kristal N. Moses!
Recently, she was selected as a NASA Endeavor Science Teaching Certificate Fellow. The project awards highly competitive one-year fellowships to 50 current and prospective teachers across the Nation. The Project is sponsored by NASA and collaborates with various states.

Teamwork is an essential part of Children’s Engineering

Getting your hands on things helps make SOL’s and theory come alive!
Moving Magnets Design Brief

You have worked with your group to find out how magnets work. Now you need to use that knowledge to meet this challenge.

**Design Challenge:**
You must design a way to make your car move along a path, without touching it. The path must have at least 3 turns. The magnets must be used.

**Criteria:**
___Path must have at least 3 turns, and be at least 18 inches long.
___Car must be able to be moved along the path without touching it in any way.
___You may only use the materials given to you.
___Everyone in your group must take part in your design and implementation.

**Materials:**
- Car
- 2 magnets
- Card stock
- One piece of duct tape, no more than 4 inches long
- String
- Popsicle sticks

**Tools:**
- Markers, crayons, or color pencils
- Glue stick
- Scissors
- Ruler
- Your magnet notes in your journal

Targeted SOL: Science 2.2
Supporting SOL: Math-Standard Measurement-2.11, 3.9

Developed by Barbara Adcock and Deborah Putney
Pocahontas Elementary School
Barbara.adcock@powhatan.k12.va.us
Deborah.putney@powhatan.k12.va.us
Timing is Everything  
Dr. Arthur Bowman, CEC President - Elect

Science, Technology, Engineering, and Mathematics (STEM) Education is a topic of national discussion. Science education in our country is now faced with working with engineering in K-12. The need to include engineering concepts in K-12 instruction, beginning at the elementary level, is being driven by the U.S. Congress and the President. We must have more U.S. citizens prepared to enter technical careers related to energy, the environment, and health. These careers are vital for national security and the overall competitiveness and health of our nation. Another driving force for including engineering in the K-12 science curricula is the National Research Council (NRC).

The NRC oversees the revisions of the National Science Education Standards (NSES) that will be used to guide the development of science teaching standards in all states. The new science standards suggest that science instruction should be less broad, more application-oriented, and inclusive of the engineering design process and concepts. This recommendation has caught many science teachers off-guard all across the United States.

Given that the Virginia Children’s Engineering Council (VCEC) is focused on design, engineering, and technology advocacy, it is definitely positioned to help others come to understand how engineering instruction can be made accessible for young children. The VCEC is a logical choice for providing leadership for this STEM education change in Virginia. In some ways the VCEC is similar to a small group of persons that are part of a larger group being given a guided tour through a famous art museum. Of necessity, some members of the tour group will be positioned on the fringe of the gathering, far from the featured works. As the tour guide announces that they will now take a close look at those works of art on the opposite side of the gallery, those that were on the fringe are now immediately in front and very close to the new featured works.

For quite a while, the E of STEM seemed to have been marginalized, or even ignored. However, the current educational climate is now causing educators to look for means of embracing engineering. Even proposed Virginia SOLs include engineering, again, beginning at the lowest elementary grades.

Engineering and science have a reciprocal complementary relationship, with engineering providing connections to the real world, and science providing knowledge allowing the natural world and engineering to address very specific problems.

Therefore, for the VCEC, we can see how the saying “Timing is Everything” is most appropriate. Many of our members have been including engineering concepts in their elementary classrooms for years. In that respect, many of you are experienced with providing engineering education for children and the time has arrived for you to come forth and provide the leadership that is needed at many levels across the state.

Dr. Bowman is a Professor of Science at Norfolk State University and may be reached by email at
What a Teacher Needs the Most

When I made the transition from a first-grade classroom to a third-grade classroom this year, I was most excited about the new possibilities for incorporating Children’s Engineering into my classroom using the new curriculum I would be teaching. What I didn’t anticipate was how challenging this would be for me to accomplish.

My classroom this year is like a revolving door, with students coming in and out during all parts of the day for things like speech therapy, reading intervention groups, and extra support for math, writing, and word study. This occurs so much that there are only two 30-minute blocks of time each day that I actually have all of my students with me. And one of those blocks is recess! As a result, I have had to do three things that I would normally not admit to—and that are very much out of character for me—to ensure that my students are exposed to the concepts associated with Children’s Engineering. I have had to beg, borrow, and steal.

Now, you may be asking yourself, what exactly is it that I am begging for, borrowing, and/or stealing? Well, let me start by telling you what it is not. It is not ideas for design briefs. The curriculum lends itself to infinite possibilities for some really fun design challenges and projects. Plus, there are some fantastic websites out there with ready-to-use design briefs, as well as other teachers who are more than willing to share ideas with me. Also, after being involved with Children’s Engineering for almost four years, I consider myself to be very creative when it comes to thinking up and creating challenges for my students.

It is not materials for the projects. I have, over the past several years, established a reputation as somewhat of a hoarder (though I prefer the term accumulator). Other teachers and past students will bring me shopping bags filled with various items and materials they no longer want or need. I have also set up a recycling center in my classroom that my students add to on a daily basis. There is a recycling box for paper of all kinds, cardboard boxes, and plastic containers and lids, cardboard tubes, egg cartons, and miscellaneous items. It’s always interesting to see what the kids bring in for the latter! No, ideas and materials are not it. What I am constantly begging for, borrowing, and/or stealing is time— Time for my students to work cooperatively, to develop problem-solving and decision-making skills, to think in a critical and creative manner, and to demonstrate a true understanding of concepts, all of which are taught through incorporating Children’s Engineering into the classroom. When I think about how important these skills are for my students, I feel, in the end, that maybe I’m not such a bad person and shouldn’t be all that ashamed of my newly acquired character flaws.

Christopher S. Lee is a third grade teacher at Crenshaw Elementary in Midlothian, VA. He can be reached at Christopher_Lee@ccpsnet.net.

Reprinted from Vol. 15 No. 4, May 2011 Children’s Technology and Engineering

Produced by the International Technology and Engineering Educators Association in conjunction with the Children’s Council of ITEEA
Get LEGO® smart!
Bring creativity and Innovation
to the classroom with LEGO® Education!

LEGO® Education delivers a K-12 continuum of solutions that include brick sets, software, activities, teacher resources, and professional development and cover robotics, simple machines, renewable energy, and more.

Classrooms with LEGO Education’s hands-on science, technology, engineering, and math projects are active and collaborative learning environments that enable students to develop the skills needed for a lifetime of creating, solving, and contributing to a global society.

“In my classroom, the motto is ‘We don’t play with LEGO, we learn with LEGO!’

Holly Doe, Elementary Classroom Teacher, Pelham Elementary School, Pelham, NH

For more information on LEGO Education and our classroom solutions, call us at 800-362-4308 or visit us online at www.LEGOeducation.us

Bring STEM to your classroom!

STEM education is showing up everywhere – from the White House to Sesame Street. But there’s no need to scramble to put together a STEM-based program when Pitsco has years of experience doing just that. We provide kits, equipment, and curriculum to help you lead students toward understanding science, technology, engineering, and math concepts and how they interrelate. Investigate the flexible programs at shop.pitsco.com to find a STEM solution for your school or classroom!

Call 800-835-0686
Visit shop.pitsco.com
2011 Convention Highlights
2011 Boat Competition

Sponsored by Newport News Shipbuilding
Students at Campostella Elementary spent their 2011 summer at the school’s Summer STEM Academy building a green “Green House”. The green house is totally constructed of plastic bottles, wood and screws. The students and their STEM facilitator, Ms. Wartika Scott, planned, designed and constructed the house as parents and volunteers prepared the raw materials for application.


Not Pictured: Dr. Arthur Bowman, Patti Fazzi, Ginger Whiting, Marcia Hickey

Front Cover

Students at Campostella Elementary spent their 2011 summer at the school’s Summer STEM Academy building a green “Green House”. The green house is totally constructed of plastic bottles, wood and screws. The students and their STEM facilitator, Ms. Wartika Scott, planned, designed and constructed the house as parents and volunteers prepared the raw materials for application.

Published by the Virginia Children’s Engineering Council, an affiliate council of the Virginia Technology and Engineering Education Association
President: Dr. Laguna O. Foster
Editor-in-Chief: Joan Harper-Neely
Field Editors: Charlotte Holter and Elizabeth Kirk
To submit an article, please send articles to JLHNEELY@aol.com and design briefs to cholter@rockingham.k12.va.us by May 25. Published articles and design briefs earn up to 45 recertification points.