

High School Biotechnology Engineering Challenge Weekend

Team effort makes high school students well-prepared to enter college

Have you ever heard “it takes a village to raise a child”? This proverb is taken to heart by the people involved with The SMILE

Program, which is why so many people made this year’s High School Biotechnology Engineering Challenge such a meaningful

and successful event for its SMILE students.

This year, SMILE high school students came to URI for a biotechnology engineering challenge centered on chlorophyll. The students worked in the labs of the Center for Biotechnology and Life

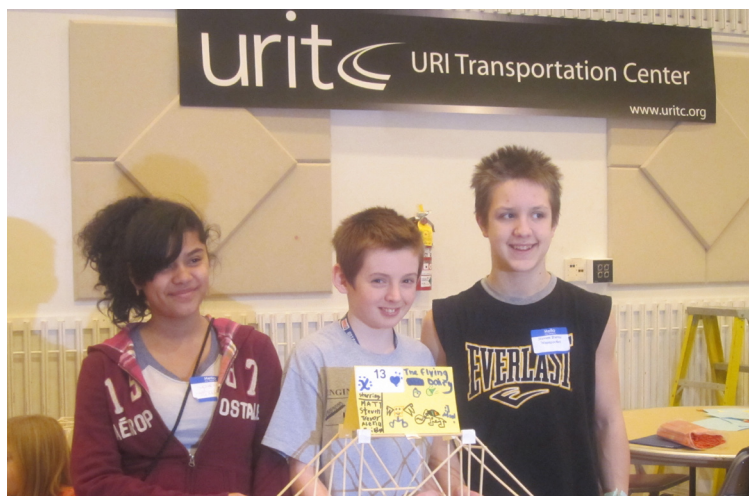


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Middle School Engineering-Transportation Challenge Weekend

Students design, build and test bridges

Bridges to Success
Record breaking event



Continued page 3

SMILE students from Central Falls, North Kingstown, South Kingstown, West Warwick, and Woonsocket came onto the University of Rhode Island campus with knowledge of different types of bridges. These students became engineers in several ways. They learned to work with new materials and tools, and with college students in science and engineering, and other majors. They also ate meals in a dining hall, and enjoyed recreation at Tootell Gym. They learned a lot about student life on a college campus and the many activities at URI.

High School Biotechnology Challenge Weekend

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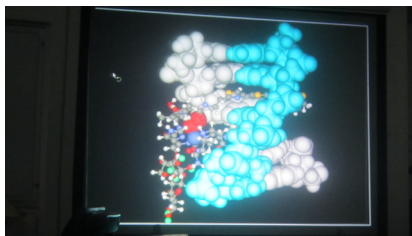


Students homogenizing spinach samples

After participating in last year's event, Dave Bassett from Amgen decided that he wanted to develop a new biotechnology challenge. Challenge themes change from year to year providing students with opportunities to work together in diverse teams, be on a college campus, interact with college student and industry mentors, and address challenging scientific problems.

Using fresh and frozen spinach, they worked to determine which source of spinach provides the most chlorophyll, which is an excellent source of nutritional magnesium. They had a protocol for isolating, collecting, and purifying the chlorophyll. Analysis of samples was done by a high pressure liquid chromatography (HPLC) instrument in the INBRE lab in Fogarty. With guidance from Amgen and URI mentors, the students used the same high tech equipment and techniques used in professional laboratories.

Other noteworthy activities included when students dropped their samples off in the INBRE lab in the Pharmacy Building (Fogarty Hall) and got a tour of the lab, heard a presentation from Dr. Bongsup Cho in the 3-D animation lab, and learned about how



Students learn about molecules in 3-D.

Freshmen, sophomores, and juniors learned about college admissions from Coral Maack, while seniors discussed college with SMILE alumni and other students currently studying at URI.

The National Society of Black Engineers (NSBE) also played a large role in the event, dedicating their entire Friday night to helping SMILE high school students. 16 NSBE students did 4 activities which SMILE students rotated through that showcased the field of engineering. Male and female students explained the different types of engineering. In the "What is College" students were able to ask their own questions about what college is really like. First-hand stories of the engineering students gave legitimacy and realism. The effective icebreakers made students from seven school districts more comfortable with each other. The activity in which students designed and tested paper airplanes was fun and debriefed well by the engineering students. These activities received the highest evaluations.

NSBE Mentors

Math analysis of the HPLC data took place on Saturday morning. Concentrations of chlorophyll were determined. Director Carol Englander recognized the seniors, and APC duffle bags were awarded to seniors with the most number of years in SMILE from each club. Wonderfully encouraging and motivating talks were given by Amgen employees Diana Anttil and Jeffrey Gardener. Diana advised "always take advantage of an opportunity, you own your own future". Jeff told students "find an authority figure-guide to help you navigate the educational territory." The Challenge Weekend was a huge success.

High School Biotechnology Engineering Challenge Weekend

Thank you to all our mentors!

Dr. Aftab Ahmed, URI INBRE Lab Core Facility Manager

Dr. Alison Roberts, Acting Dep't Chair, URI Biology
Amgen

Special thanks to Dave Bassett, Jess Morse, &
Amgen volunteers

American Power Conversion by Schneider Electric

Special thanks to Ladi Solola, Gerald Mwangi &
Caroline Castillo

Asian Students Association

Dr. Bongsup Cho, URI Biomedical &
Pharmaceutical Sciences

Center for Student Leadership

Special thanks to Ben Fain

College of Engineering

Coral Maack, URI Admissions

Courtney Schmidt, Graduate School of
Oceanography

Dr. Jay Sperry, Dep't Chair, URI Cell & Molecular
Biology

Linda Forrester, Manager of URI Biology labs

Dr. Marian Goldsmith, Dep't Chair, URI Biology

National Society of Black Engineers (NSBE)

Society of Hispanic Professional Engineers (SHPE)

Tau Beta Pi Engineering Society (URI Chapter)

SMILE alumni at URI

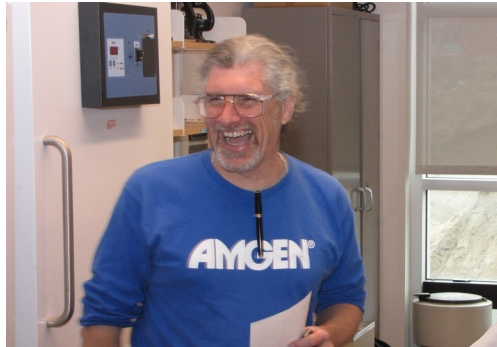
Special thanks to Jimmy Li, Ahmed ElAraby, Josh
Sargent, and Michaela Cashman

Toray Plastics, America

URI student volunteers

Special thanks to Alysse Quiterio

Amgen Mentors



Mentors give
SMILE students
one-on-one
instruction



Club Spotlight

South Kingstown High School

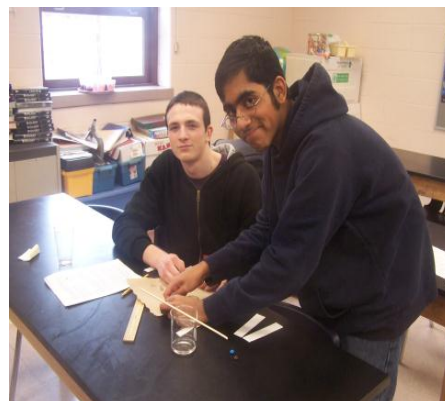
Learning Science through Exploration

Article written

Sean Eden and Kevin Matthews, grade 12

This year in SMILE we explored many interesting topics, while broadening our knowledge base. We started the year investigating the effects of the BP oil spill and the consequences that we as a society have to face. We invited Dr Spalding, a professor of Ocean Engineering from the University of Rhode Island to speak about the disaster and help us to further understand it.

We are now moving onto our next subject of chromatography and plan to learn more on the subject during our challenge weekend in April.



Students learning about chromatography by examining the coloring found on M & Ms



South Kingstown students in Amgen Lab during the 2011 HS Biotechnology Challenge



"I joined SMILE to make new friends of the same interests and learn new things while being exposed to many viewpoints and ideas."

SK High SMILE Student

South Kingstown Elementary School

We started off our year with a trip to Camp Hoffman where we did water testing. We were investigating whether a certain fish could live in the water at the camp given certain guidelines (pH, DO, temperature, etc.). Our next project was to prepare for Family Science Night. We researched the BP oil spill and its effects on the environment, both marine and human. With the information, a power point presentation was created for all to view.

Our families and friends were also able to test different substances to see what which one would be best to clean up a spill. We also demonstrated the mixing of water and oil by simulating the ocean currents, waves and wind. In addition, parents and friends were challenged by a math puzzle.

Our next unit involved dolphin behavior and sounds. Just like us, they communicate with certain sounds and body movements! Now, we are practicing our teaching skills by demonstrating student led science experiments. Each one of us gets to pick an experiment which we present to the class. It's fun and scary at the same time.

Looking forward to Alton Jones in the spring!

Water testing at
Camp Hoffman



Woonsocket Middle School

SMILE – Learning Ocean Science Through Ocean Exploration

While the snow-storms of winter kept us out of school a bit in January, our SMILE club did several inquiries into the use of “instant snow polymer”. When water is added to this polymer powder small, fluffy clusters of powdery snow appear. By adding more water, slush is formed.

We also made gum, using chicle from the rain forest. It was fun to try our hand at making this sticky stuff that middle school students love (and taking a look at the rain forest from where it comes)

We have been looking, talking and building bridges to prepare for this year’s URI challenge. We are also looking forward to our field trip exploring bridges of RI on March 5, 2011.



Middle School Challenge Weekend at URI

The questions of the month are:

“When do we go to URI?”

“What will we do there?”

The old-timers love to recount our last year’s overnight.

Mara showing off our “snow.”



Dr. Raymond Wright, Dean, College of Engineering welcomed the students to the Challenge.

Middle School Challenge Weekend

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Students arrived early Friday morning at the URI Memorial Union Ballroom, were greeted by URI leadership students and organized into teams. URI Dean of Engineering Ray Wright welcomed the students to the University of Rhode Island, explained what engineers do and showed a video of a URI engineering graduate who heads up a NASA team. With their URI student mentors, they immediately got busy with team building activities which included design of a team sign.

Bridge construction begins!!

The design and construction phase of the engineering project was definitely challenging. John Steere, professional engineer, explained the challenge to design, build, and test a truss bridge. Students had to first draw a full size template of their bridge, with the correct geometry, component lengths, and distance of the joints. The bridge had to cover a span of 20 inches, overall length of the bridge was between 22-23 inches and the model bridge had to allow a 4inch wide x 4 inch high block to pass through it over the roadbed. Given a maximum budget and cost of materials, students needed to determine the cost of their bridge and if necessary, modify their design to meet specifications. Construction equipment included bamboo chopsticks, glue guns, cardboard, straws, and diagonal pliers.



There was also a SMILE Construction Accounting Math Challenge. The supplies that teams were given had a cost listed on their inventory sheet. They kept track of expenditures for additional supplies and their returns on the inventory list. An accurate account of team expenses was handed in at the end of the Challenge. Students ate lunch in the dining halls and returned to their project. Mid afternoon, student leadership mentors led groups of students in ice breaker activities.

Middle School Challenge Weekend

Thank you to all our mentors!

American Power Conversion by Schneider Electric

Special thanks to Ladi Solola & Gerald Mwangi

Arnold Lumber

Center for Student Leadership

Special thanks to Ben Fain

College of Engineering

Eaton Aerospace

National Society of Black Engineers (NSBE)

Society of Hispanic Professional Engineers (SHPE)

Toray Plastics, America

Steere Engineering

Special thanks to John and Patricia Steere

URI Transportation Center

URI student volunteers



Bridges constructed and ready for testing



Jeff Cathcart, URITC, testing student bridges



URI Student Leadership mentors conduct team building exercise

Club Spotlight

Central Falls High School A year in the life of the Central Falls' SMILE club by David Hernandez, grade 11

SMILE has been quite exciting and interesting. So far, we have learned about a different range of topics, water insects, oil spills, and chromatography. At the beginning of the school year we learned about different types of bugs that were collected during the summer by a group of SMILE students. The bugs were collected at two sites on the Moshassuck River, in one in Lincoln and one in Providence, as part of the Vermont EPSCoR Stream project. Some of the bugs that were collected were the Caddisfly Larva and Scuds. An interesting fact about these bugs is that they show whether a river is clean enough to sustain life or not, because if it is not clean, unlike many other bugs, these will not live there, therefore, if the river is clean, these insects will not be found.

After examining the bugs, we took advantage of the fact that the oil spill in the Gulf of Mexico and we did research about some of the oil spills around the world and their dire effects to the ecosystem. For instance, we came across the Exxon Valdes oil spill that took place in 1989, some of the interesting things that we found were that the amount of oil spilled could fill 125 Olympic-sized swimming pools. The cleanup required about 10,000 workers, 1,000 boats and roughly 100 airplanes and helicopters, and if all were not enough, twelve years after the spill, oil could still be found on half of the 91 randomly selected beaches surveyed. To wrap up the topic and prepare for the family night we did a cool experiment using feathers, chocolate, water, and oil; these were supposed to represent what would happen to a bird that made contact with the oil in the ocean; we also cleaned this "oil" using dawn dish soap, the ultimate solution when it comes to clean oil.

After all this, the family science night came around and we had a great time sharing our experiences and knowledge with parents, teachers, and friends. We had power points, games, representations of the oil spill and its consequences and of course, very delicious food!

Before leaving for Christmas vacation we decided to play secret Santa, each of us chose a member of the team randomly to give him/her a secret present when we got back from vacation. This activity turned out to be very special because everyone came up with really nice presents which show the unity of our SMILE family.

Last but not least, we are now getting ready for the SMILE challenge by learning more about Chromatography and its uses. We have been doing so by reading articles, doing computer research, and sharing the information and things that we learn as we go along in our research. We are fond of all the memories that we have had, such as the trip to Harvard University, family nights, visit to the Boston Aquarium, challenge weekends, ROVs, etc.

We love SMILE!

SMILE High School Students from Central Falls
at the
2011 Biotechnology Engineering Challenge



Central Falls High School
SMILE Club Meeting

Club Spotlight

The second year of SMILE at Davisville Middle School began with several new 6th graders who joined our club along with many returning seventh graders. The first half of the year was filled with activities relating to the study of the Titanic that kept the members very interested and busy. The Discovery movie about the Titanic brought a better understanding to the group. We also read the Providence Journal's account of the sinking from a copy of the original paper from that time. Their favorite activity was learning about the Morse Code, using an online translation and interactive program.

The highlight of the year was preparing for the Middle School Challenge Weekend. Members learned about the different types of bridge structures and work together to plan, design and build a replica of a world famous bridge. Students were very resourceful in the material that they used. They had great fun simulating different bridge structures and designs using the West Point Bridge Designer. Students were well prepared for the Challenge Weekend when they built truss bridges in teams. They learned much from the URI students and well as engineers from TORAY and APC.



SMILE Club
with model replica of a world
famous bridge

Davisville SMILE teacher and SMILE
students at the 2011 Middle School
Engineering Challenge Weekend



SMILE STAFF

Carol Englander
Director

Augusto Gomes
Assistant Director
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Lacey Schlachter
Program & Evaluations
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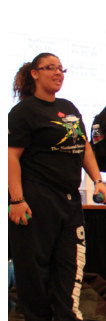
Robert Vincent

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Middle School Challenge

They returned to bridge building, had dinner at the dining halls, and returned to finish their bridges. Once the model was built, students weighed their bridge, then Jeff Cathcart, URI Transportation Center Outreach and Education director, attached it to "Bridge Buster" testing mechanism: a bucket attached to a bolt inserted in a wood plank sitting on the road bed. Weights were added to the bucket until the bridge collapsed. The students determined the bridge efficiency, the mathematical ratio of the weight held by the bridge, to its own weight (load (g)/ bridge weight (g)). At the end of the Challenge, teams put their completed bridges on the testing table for all to see. The greatest load a bridge held was 89 lbs.- A SMILE record!

Saturday morning activities included tours of the URI campus led by Office of Admissions tour guides and an "introduction to college" activity planned and implemented by NSBE (national society of black engineers). A closing ceremony included congratulations to all our students from Director Carol Englander who recognized students' commitment to SMILE. SMILE teachers received URI notebooks and URI sunglasses from the URI Bookstore for all their students, along with SMILE certificates and an application for the URI Transportation summer camp. A "THANK YOU" to all our teachers, URI faculty and student mentors, and sponsors who helped to make this Challenge a wonderful experience.



SMILE Newsletter

University of Rhode Island
50 Lower College Road, Suite 305
Kingston, RI 02881
Phone: 874-2036

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Carol Englander, Editor
Patricia Macchioni, Publications Coordinator
Nick Blacklock, Printing APC

SMILE (Science and Math Investigative Learning Experiences) is an enrichment program for educationally disadvantaged students in grades 4-12 in four Rhode Island communities. SMILE's goal is to provide group activities for these students in math, science and computers. Generous gifts by participating donors make this program possible. The University of Rhode Island SMILE Update is published four times a year. We encourage your comments and ideas. Please share this newsletter with others who might be interested in SMILE.

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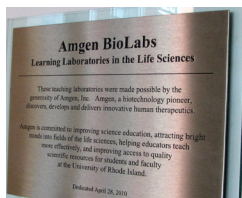
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Calendar

Weekly SMILE Clubs Meetings

Scientific and Career Exploration Field trips

Special Annual Events

High School
Challenge Weekend
April 1-2, 2011
URI Kingston Campus

Middle School
Engineering Challenge Weekend
March 11-12, 2011
URI Kingston Campus
Elementary School
Outdoor Science Adventure
April 29-30 - May 1, 2011
URI Alton Jones Campus

Teachers' Professional Development Workshops

January 28, 2011	May 13, 2011	July 19-21, 2011
University of Rhode Island Math and Science Curriculum. Special events planning	University of Rhode Island Math and Science Curriculum. End of year evaluation	University of Rhode Island Math and science Curriculum Planning for the year

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The SMILE Program
50 Lower College Road, Suite
305
Kingston, RI 02881-0800

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