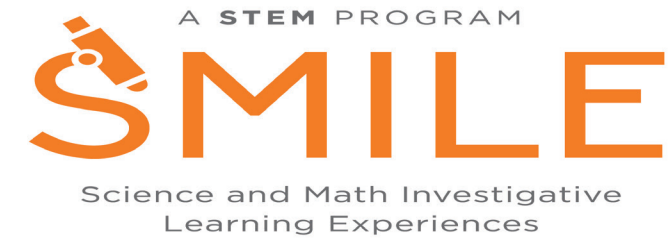


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Newsletter
volume 23 No.2, April 2017

23 Years of service

Middle School Engineering Challenge

High School Engineering Challenge



On March 3, SMILE middle school students from around the state gathered at the University of Rhode Island's Kingston campus for the 2017 SMILE Middle School Engineering Challenge Weekend.

This year at Middle School Challenge Weekend SMILE students designed and built trust bridges using bamboo chop sticks and glue. One hundred and thirty-five SMILE students from Central Falls, Pawtucket, Newport, South Kingstown, Westerly, West Warwick, and Woonsocket came onto the University of Rhode Island campus to experience what it's like to be an Engineer. To build the bridges students needed to work to a set of specifications, work within the limits of a budget, test their design, redesign and make changes, and then watch the structure perform their function.

The construction and testing of model bridges promotes the study and application of some fundamental principles in mathematics and physics. This experiential learning activity teaches basic principles of load and force transfer through truss design. The activity also helps students develop teamwork and problem solving skills. They worked with students from other school districts and with college students in science and engineering majors. Very quickly SMILE students learned that the collaborative synergy of the group often produces the best results.

Continued on page 2...



This year, over 100 SMILE students participated in SMILE's 23rd annual High School Challenge Weekend. Students arrived at the University of Rhode Island on Friday, March 31st, from Central Falls, Newport, Pawtucket (Shea and Tolman), South Kingstown, Westerly, West Warwick, and Woonsocket. Each team (investigative unit) was tasked with solving the case of the missing plant. This was SMILE's first time doing a forensics-themed challenge. It was a huge success.

Dennis Hilliard, Director of the Rhode Island State Crime Lab, which is housed at URI, welcomed the students. He discussed how the Crime Lab operates and the science that is done there. Mr. Hilliard also discussed professions in the forensics field and the education path to get there. He recommends a strong chemistry foundation.

Students were then presented with the challenge. Each investigative unit was given an "Evidence File" with background information about the crime and profiles of each of the five suspects. The story of the crime was dramatically presented by Claire Wilson, SMILE's Program Coordinator. Students had to work together throughout the day to figure out who stole the rare Japanese chrysanthemum bonsai from the Rhode Island Horticultural Museum based on the evidence that was left behind. The plant has an estimated value of 2.6 million dollars.

Continued on page 6...

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The SMILE Program relies on the generous support of our donors. Invest in the future of RI students by supporting SMILE.

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Calendar

Weekly SMILE Club Meetings
Scientific and Career Exploration Field Trips

Family Science Nights
November 2016

Special Annual Events
High School
Engineering Challenge Weekend
March 31-April 1, 2017
URI Kingston Campus

Middle School
Engineering Challenge Weekend
March 3-4, 2017
URI Kingston Campus

Elementary School
5th Grade Outdoor Science Adventure
April 7-9, 2017
URI Alton Jones Campus
4th Grade Ecology Event
April 13, 2017
URI Kingston Campus

Teachers' Professional Development Workshops

August 24-25, 2016	Dec 1, 2016	May 25, 2017
University of Rhode Island	University of Rhode Island	University of Rhode Island
Math and Science Curriculum Planning for the year	Math and Science Curriculum Special Events Planning	Program Evaluations



Printing donated by **Schneider Electric**



Students arrived early Friday morning at the URI Memorial Union Ballroom, were greeted by URI SMILE staff and organized into teams. SMILE Director Carol Englander welcomed the students to the University of Rhode Island, explained what engineers do, and presented the specifications of the challenge to design, build, and test a truss bridge. Students first had to draw a full size template of their bridge, with the correct geometry, component lengths, and distance between 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 Super Easy cutters.

With their URI student mentors, they immediately got busy with team building activities followed by the design and construction phase. 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. 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. All afternoon, students worked on bridge building, took a break and had dinner at the dining halls, and returned to finish their bridges. Once the models were built, students weighed their bridge, then SMILE teachers from Deering (Eugene Gallo, Christopher Baccei) and Westerly (Rob Brennan, Carolyn Michaud) attached them to “Bridge Buter” testing mechanisms: a bucket attached to a bolt inserted in a wood plank sitting on the roadbed. 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/bridge weight). At the end of the Challenge, teams put their completed bridges on their team tables with the testing results for all to see. The greatest load a bridge held was 66 lbs. Student teams were given recognition for the bridge that was most efficient, most weight held, least cost, and most cost efficient.

The Challenge Weekend is a fun way to visit a college campus and provides an opportunity to get young people interested in science, math and engineering fields of study and careers. SMILE students learned a lot about student life on a college campus, toured the new science buildings: Chemistry, Pharmacy and CBLS (College of Biology and Life Sciences), ate meals in a dining hall, and enjoyed recreation at Tootell Gym. Saturday morning activities included talks by URI tour guides and an “Introduction to preparing for College” presented by Coral Maack, URI Admissions officer, and URI senior Ben Concepcion.

Our SMILE Middle School students have put themselves on a path to college and have high expectations for themselves. A huge “THANK YOU” to all our teachers, URI faculty and student mentors, SMILE staff, and sponsors who helped to make this Challenge a wonderful experience.



In preparation for the challenge SMILE clubs designed and built small truss bridges made out of balsa wood, with the goal of building something that could withstand severe ground shaking during a simulation earthquake. During the challenge Dr. George Tsiatis, Department of Civil and Environmental Engineering tested the balsa bridges for their ability to support transverse acceleration developed using an earthquake simulator (Shake Table). Students were amazed at the destructive forces of an earthquake as their bridges succumbed to the shaker.



We would like to thank the following list of funders that have allowed SMILE to grow and continue to provide high quality after-school STEM programming to Rhode Island students:

Amgen Foundation	Ramsey McCluskey Family Foundation
Amgen Biotech Experience	Rhode Island Foundation
Amica	Schneider Electric
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Graphic Expressions	Central Falls School Department
URI Graduate Students Association	Newport School Department
Holiday Inn South Kingstown	South Kingstown School Department
Lloyd G. Balfour Foundation, Bank of America, N.A Trustee	Pawtucket School Department
Nordson Corporation Foundation	Westerly School Department
NOAA B-Wet Program	West Warwick School Department
Pawtucket COZ-21 st Century	Woonsocket School Department
Pfizer	

We would also like to thank our Individual Supporters, who are vital in helping The SMILE Program to continue its mission

The SMILE Program		
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Shea High School, Pawtucket

Ann Marie LaRoche, Jennifer Bromley
By Aleida Gomes and Minadira Silva



Our SMILE Club activities range from fun fieldtrips to exciting labs, and mostly smiling new faces! SMILE is a club where students learn a lot about math and investigating in the field of science.

This year we began working with the Engineering design Process. It consists of asking questions, research, developing a plan, and building, testing, evaluating, revising the building and testing again. During this unit we built bridges with rolled up papers and were amazed to learn how much mass each could hold. We have been learning about Forensics. We did a fingerprint activity, footprint impression activity, mock crime scene investigation and looked at hair fibers with microscopes. SMILE is a really great club where new friendships are made and everyone works as a team to come up with new ideas and different strategies to work on an activity.

This year we had a family science night to talk with parents and guardians about the experiences and new things we had learned and built. There were many people at

the family night, and one of the activities that kept them entertained was the marshmallow challenge. We had to build a tower using spaghetti and then try to put a marshmallow at the top. The tallest tower that didn't fall over would be the winner. We had some amazing field trips. We had a field trip to Kettle Pond to observe marine life and see how living things live in the ocean.

One of the best field trips was the trip to the New England Aquarium. It was exciting because we got a chance to see beautiful animals. Other than fun activities, SMILE helps students look forward to college. Students who participate in SMILE have a better idea of what they want to major in. Our teachers were important in helping us and following through with each activity.

SMILE is an awesome club and students can really learn a lot from it.

Thompson Middle School, Newport

Candace Lewia, Elizabeth Gibbs
By Mariela Miniño and Lily Sones

Do you know when you are in an amusement park, and you get in line for one of the roller coasters? That is how it feels in the SMILE Club. You start with doubts like, "I wonder if I will make friends, or learn something from it." However, let me assure you, you will make friends and do loads of fun challenges that will teach you things that will stick with you for the rest of your life. This year our focus was on Engineering and the different types of careers in that field; we built everything from robots with sensors to bridges to paper/straw boats. Every Wednesday you never knew what task you would be put up to; you could be allotted an hour to make a tower out of popsicle sticks or a paper cup moving around using a fan mechanism. If you want to learn new things while having fun with friends, SMILE is going to exceed your expectations.

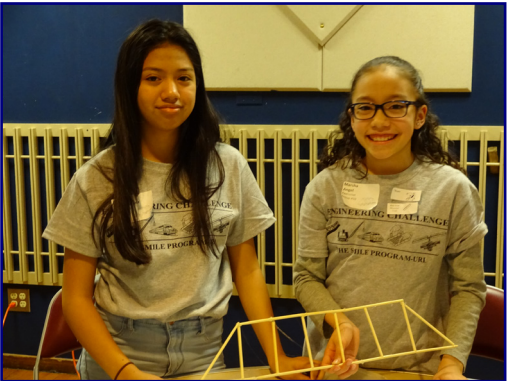
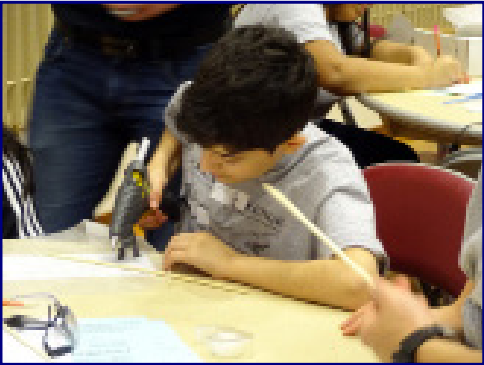
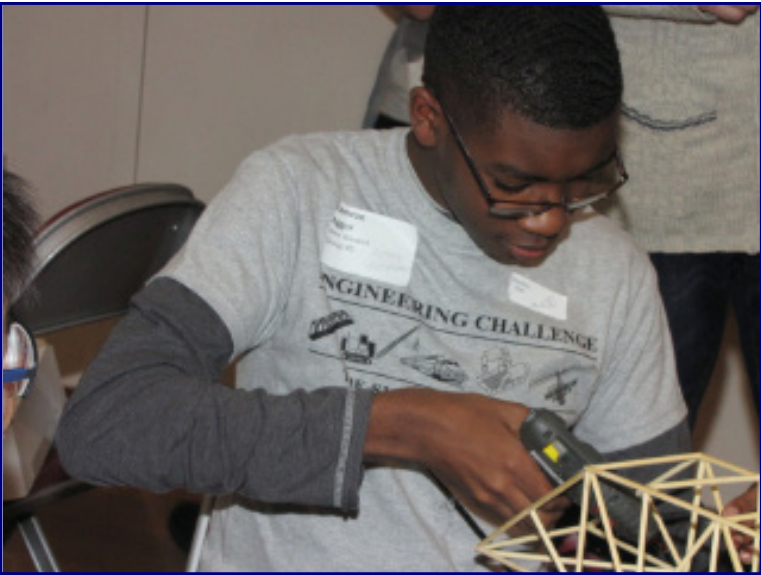
– Mariela Miniño



When I joined SMILE in seventh grade, little did I know it would shape the next two years of my life. I have learned about teamwork, leadership, the effects of humans on the environment, careers in science and math and my favorite: engineering. As it turns out I love designing and building everything from buildings to bridges to robots! I never imagined that I would love engineering as much as I do and thanks to SMILE I have found my calling! Luckily, "Engineering" was the theme this year and I have learned even more about it. Every meeting is a new, engaging hands-on activity and a chance to make new friends. SMILE has opened opportunities and given me memories that will last a lifetime. From the annual URI challenge weekend to the friendly competitions in class to see what team has the best structure, I will always appreciate the time I spend in SMILE.

- Lily Sones

"I love coming to Challenge Weekend at URI because it reminds me my dream is still in reach."



"My favorite part of SMILE is being able to unlock my engineering ability. I would never have been interested in building if it wasn't for SMILE."

Left: SMILE students work together to design and construct their bridges.

Below: With the help of SMILE Teachers, students test their bridges to see how much weight they can hold.



Peacedale Elementary School, South Kingstown

Martha Badigian, Christine Pierce
By Peacedale SMILE Club



Above: Dr. Chris Roman gives Peacedale Elementary SMILE students a tour of the Endeavor oceanographic research vessel at URI's Bay Campus.

Peace Dale Elementary school is the new location for SMILE this year in South Kingstown. Our program includes students in grades four and five from Broad Rock, Peace Dale and West Kingston schools. The engineering curriculum has been very exciting for our elementary club members this year. We have built roller coasters and bobsled runs, crafted floating satellites, and created electric robots. Students had a fantastic time at Family Science Night guiding their family members through the engineering design process and involving them in hands-on engineering activities. In addition to Family Science Night, a few students were able to attend the Yankee Steam-Up in East Greenwich in October to explore the world of steam design. Our field-trip to the URI Bay Campus was amazing and included a tour of the Endeavor and a presentation by URI graduate students involved in designing underwater ROV's.



Citizens Elementary School, Woonsocket

Jodi Cifelli, Amanda Ward
By Citizens' SMILE Club

"The trees were so cool! Learning about the trees age by the rings and if the tree did not have enough light or water!"

-Jarelys and Sarah

"The bubbles were cool. We did experiments and tried to even make a square!" -Bentley

"The field trip to the Boston Museum of Science was amazing and a SUPER FUN experience!" -Molly, Yandeh, Sol

"We loved the Electricity Show. It made us want to go into Science!"

-Christiana and Jaclyn

"One of my favorite parts of SMILE was the robots; it was interesting and amazing to make two circuits!" -Gloria, Mia

"We loved the rollercoaster because we got to make all different designs." -Noah

"The wind tunnel was cool because it challenged you to make something just the right weight." -Jamie and William

"Don't forget about Science Night! It was awesome to show our family what we learn in SMILE." -Christiana

"The field trip was so awesome, especially the playground and the 360 degree movie!" -Lacey and Shyanne

"The planetarium was the BEST!" -Angel

"Making new friends for classmates is my favorite part of SMILE." -Diego

"I like being in SMILE and soon we finally get to go to camp!" -Brycen, Daniel, Danaysia and Jahnayah



Springbrook Elementary School, Westerly

Lisa Kenyon, Nicole Roberts
By Springbrook SMILE Club



Springbrook Elementary School's grade 4 and 5 SMILE club is off to a great start! Students greatly enjoyed the hands-on engineering investigations that started off the year. Families showed enthusiasm and support for this new district initiative by turning out for our first Family Science Night and providing fantastic food. Students challenged their parents to try some of their favorite investigations and SMILE students engaged in activities presented by the other clubs. In December, the Middle School and Elementary clubs enjoyed a day together at the Museum of Natural History and Planetarium in Providence exploring toys in space. We are looking forward to spring weather to get outdoors and dig deeper into our ecology investigations as we prepare for our spring field trips. Highlights from some of our fantastic SMILE students:

- I love that SMILE is all hands-on activities. I also like how we can start looking at jobs that we might want to work on when we are older. My favorite event has been Family Science Night because we got to share with parents all of our fun activities. SMILE is very fun!

-Fiona Smith, grade 4

- I love SMILE because math and engineering are in SMILE and they are my favorite subjects. My favorite activities are the roller-coaster run, domes and dowels, Family Science Night, soaring satellites and stoppable robots. I liked these activities because we got to work in groups and make new friends. Also, when we work in groups we have to find our mistakes then improve and see if our design works.

-Camren Lewis, grade 5

- I like SMILE because we get to do amazing things. I've learned a lot of things I didn't even know about. Something I've learned from SMILE is that every animal in an ecosystem is included in that ecosystem's food web. It's fun because we get to go on field trips and do fun experiments. On our previous field trip we learned how things in space work without gravity. This was my favorite event.

-Lucas Santiago, grade 4

Woonsocket Middle School at Villa Nova

Marie Gentile, Rania Aghia
By Brianna Paul and Natalia Koziatek



The Smile Challenge Weekend 2017 was an incredible experience for us Woonsocket Middle School SMILE students. We were able to have a hands-on experience with other SMILE students across Rhode Island. This year, we were challenged to create a truss bridge that could hold weight. The highest weight a bridge could carry was 66 pounds. During that experience, many groups had to redesign their bridges to make them better. We all gained much more knowledge for the future. We also had the chance to consult URI students for advice. After our challenge, we walked around the campus and got to learn more about going to college someday. And don't forget the amazing food they had there! Apart from that, the SMILE Challenge

Weekend was a fun and educational experience for us all, and we can't wait to come back next year! Bring on the challenge!

We would like to thank all of the SMILE teachers, staff, and college students for giving up your time to give us this opportunity!





To wrap up, Dr. Patricia Ogera, M.D., from the State Medical Examiners Office, was our keynote speaker. Dr. Ogera shared her inspiring story about going to school in NYC and getting into the forensics field. Dr. Ogera specializes in forensic pathology. She spoke of the details of her daily work. Students were excited to learn about another career option.

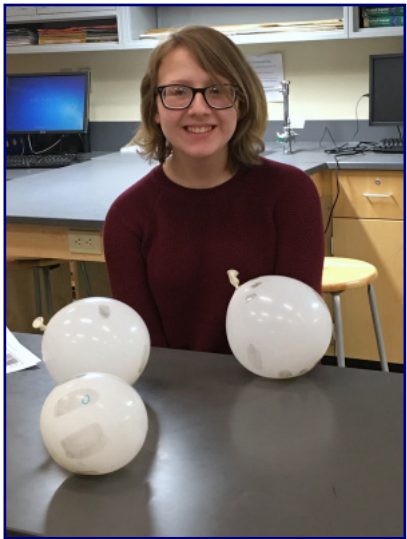
It was another successful challenge weekend that gave students a unique and authentic experience. Coming to a college campus, interacting with college and industry mentors, accomplishing a challenging task, and working with other motivated students from around the state are just a few of the major highlights that SMILE students get to experience to set them on a pathway to college and success. Of course, it's bittersweet to see our seniors move on from high school and SMILE to college; we are going to miss their enthusiasm but we're excited to hear about their many successes. We're also excited for the freshmen, sophomores, and juniors to return to SMILE next year to build on what they've learned and be excellent role models for the younger students. Of course, a special thanks also goes to Amgen, van Beuren Family Foundation, Verizon, Rhode Island Foundation, and Lloyd G. Balfour Foundation - whose funding support made this event possible.



Clockwise from bottom left: SMILE High School seniors in SMILE three or more years are honored at SMILE's closing ceremony; Postdoc Researcher Christopher Thawley works with SMILE students in the DNA Lab; JD Edwards of the RI State Crime Lab, Detective Gorman of the Lincoln Police Department, and Nicole Richard of Steere Engineering talk with SMILE students during the panel discussion.

Westerly High School

MaryJane Utley, Stacey Leitz
By Westerly SMILE Club



In our first year as a SMILE Club we have experienced some very interesting and exciting events. Our first annual Family Science night was held at Springbrook Elementary School on November 30 at which we welcomed well over 100 participants as the clubs from Westerly Public Schools presented some of their favorite activities. The first semester focused on engineering practices where students explored ways to build a robotic hand, design a Rube-Goldberg machine and experimented with Creepy Slime. We took a field trip to the Rhode Island Resource Recovery facility in Johnston to learn about the basics of landfill management and single-stream recycling. But the focus of our URI Weekend Challenge, Forensic Science, has proven to be the most exciting of all! WHS SMILE members totally love the whole process, from sketching a crime scene to analyzing fingerprints, hair and fibers as well as testing “unknown powders.” We are working on our Stewardship Project, which will include collaborating with our local Tower Street School Community Center in their organic garden facility. Going



forward, we hope to foster an environment of learning and academic engagement through SMILE that continues for many years to come.

Curtis Corner/Broad Rock Middle Schools, South Kingstown

Jo-Ann Basel, Gina Haberlin
By South Kingstown Middle School SMILE Club

The SMILE club of CCMS/Broad Rock Middle School attended the Engineering Challenge Weekend on March 3. After attending SMILE Challenge Weekend at URI we asked our students what inspired them about the weekend. These are some of their responses.

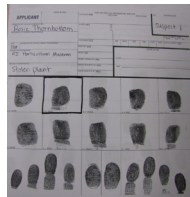
After attending the SMILE Challenge Weekend, I feel inspired to...

- Attend college. I would also like to get into honor classes in High School.
- Build bridges and to make good and strong bridges.
- Study mechanical engineering.
- Build more things. Building a bridge helped me understand the importance of triangles in bridge construction.
- Look at URI as a possible college for me to attend.
- Get a job in the STEM field.
- Keep trying to make my dream come true and to succeed.
- Keep pursuing my dream to be a marine biologist.
- Build more bridges as well as to go to URI.
- Study biomedical engineering at College.





SMILE
High School students
crack the Case of the
Missing Plant
in a forensics-themed
challenge at URI.



Students rotated through four laboratory investigations to gather data. These labs included: (1) fingerprints, (2) shoeprints, (3) DNA electrophoresis, and (4) trace evidence. JoDon Edwards, who works in the Latent Prints department at the State Crime Lab, facilitated the fingerprinting lab. Students learned how to identify different types of fingerprints and dusted for prints left behind at the crime scene. They were then able to compare the crime scene prints to those of the five suspects. Detective Sean Gorman of the Lincoln Police Department facilitated the shoeprint lab. Students learned about visible, plastic, and latent prints before investigating the prints left behind at the crime scene. They were able to photograph the crime scene prints as well as the suspects' shoes. Students learned that shoeprints are only a small piece of the puzzle when working to solve a crime. Students were urged to pay attention to detail, including foot direction, tread design, size, wear patterns, cuts, gouges, cracks, and foreign debris (rocks, tacks, glass, etc.).

The DNA electrophoresis and trace evidence labs took place in the state of the art labs in URI's Center for Biotechnology and Life Sciences. Thank you to Linda Forrester, manager of the undergraduate biology labs, for allowing SMILE to utilize the labs and equipment. During the DNA electrophoresis lab, students learned how to use a micropipette and load gels with DNA from the crime scene and the five suspects. They "ran" their gels to figure out whose DNA was left at the crime scene. During the trace evidence lab, students looked at hair, fiber, and pollen samples underneath microscopes. They were able to compare the evidence left at the crime scene to those of the suspects.

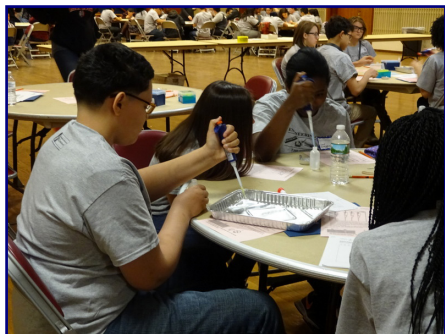
As usual, volunteer mentors were an integral part of the event. URI students from different organizations, as well as professionals from Amgen, Women in Transportation, and Steere Engineering were excellent role models and helped make the event a success.

After eating dinner in the dining hall, students came back to the Memorial Union to work together in their investigative units to analyze their data in order to figure out who committed the crime. They were able to narrow the field of suspects and ruled out anyone not supported by the data. They then presented their conclusions in an open mic format, where students gathered around and cheered each other on. Students had a lot of fun formulating their conclusions. Turns out, all teams got it right!

Once the long day of laboratory investigations was complete, SMILE students enjoyed some much-deserved downtime in the URI pool and on the Keaney basketball courts before heading to the Holiday Inn in South Kingstown.

On Saturday, students rotated through two panels – student pathways and career pathways. During the student panel, six motivated URI students shared what it's like to be a college student, financial and scholarship information, studying tips, extracurricular activities, internship and fellowship opportunities, details about the Talent Development program, and even tips about dorm life and roommates. The professional panel was just as helpful. Professionals from the field shared their personal stories about their education and career paths. SMILE students asked great questions and learned that there are a lot of ways to be successful.

Continued on page 8...



SMILE students
rotated through a
series of lab
investigations
including fingerprints,
shoeprints, DNA elec-
trophoresis, and trace
evidence.

