

A STEM PROGRAM

# SMILE

Science and Math Investigative  
Learning Experiences

Newsletter  
Volume 28, No. 3 May 2022

*28 Years of Service \**



**SMILE Elementary Students gathered at URI for Ecology Field Day, a fun filled science field sites exploration.**

**SMILE High School students from around the state gathered at URI for our first ever Smart Helmet Challenge.**



## HIGH SCHOOL ENGINEERING CHALLENGE



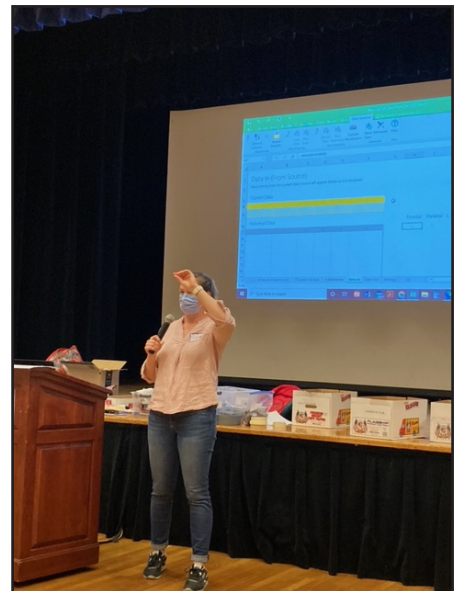
High School Engineering Challenge- designing and testing a safer football helmet

SMILE high school students from six RI school districts came to URI to work in teams that designed and tested materials to be used in a safer version of a football helmet. They made a paper model of the brain, made sensors that attached to each of the brain lobes, programmed an Arduino uno , wired it to a breadboard, to which they attached the sensors. Using excel data streaming, students recorded baseline measurements of brain injury units, without strikes, and with strikes by a swinging tennis ball to one of the lobes from an angle of 30, 60, or 90 degrees. Students evaluated 4 hard materials and 3 soft materials for a total of 12 possible combinations. Each team presented their BIU data on the most effective combination of materials to protect that lobe from injury. Students gained important knowledge about functions of the brain, and the use of electronic sensors and a microprocessor to collect data in real time.



**“I enjoy SMILE very much. It is a way to immerse ourselves with very interesting hands-on topics that let us actually become the engineer/scientist.”**

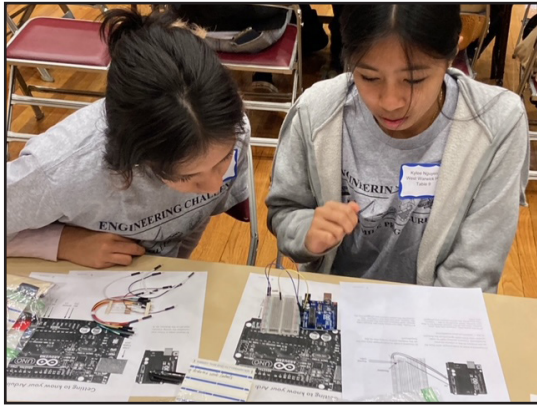
**-SMILE Student**



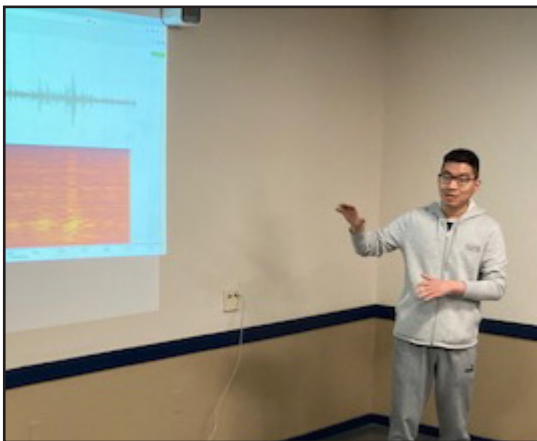
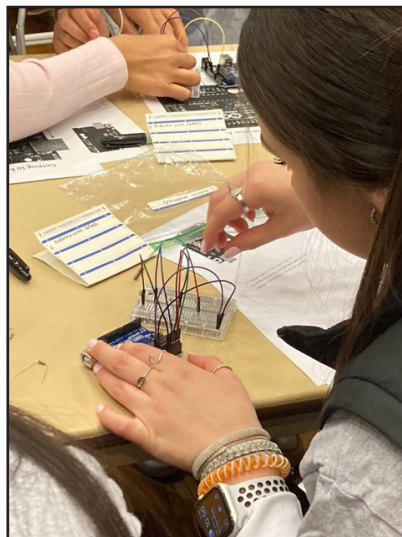
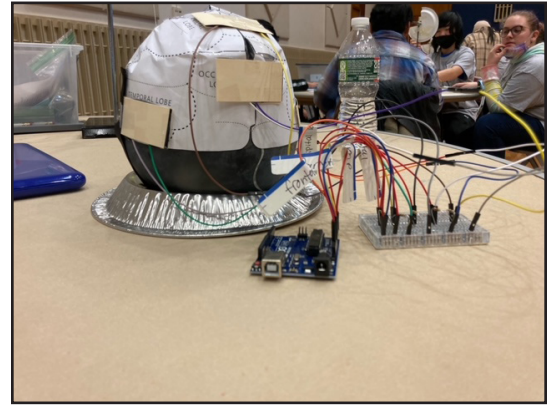


## HIGH SCHOOL ENGINEERING CHALLENGE

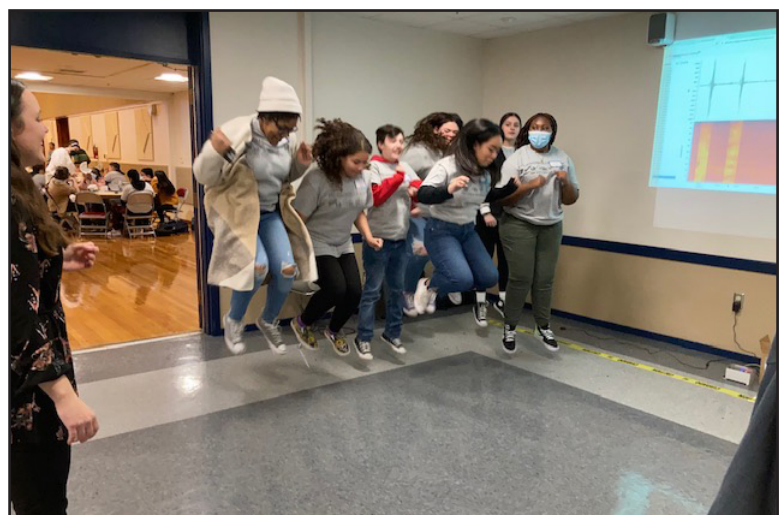
**"I love getting to do fun activities (hands on) and being more involved in the stem community and making new friendships."  
-SMILE Student**



**Smart  
Helmets  
Smarter  
Students**



Professor Wei from the Graduate School of Oceanography and his lab visited us at the Challenge to show SMILE students how they measure and analyze wave lengths from earthquake seismographs.



*Making Waves!*



## CLUB UPDATES

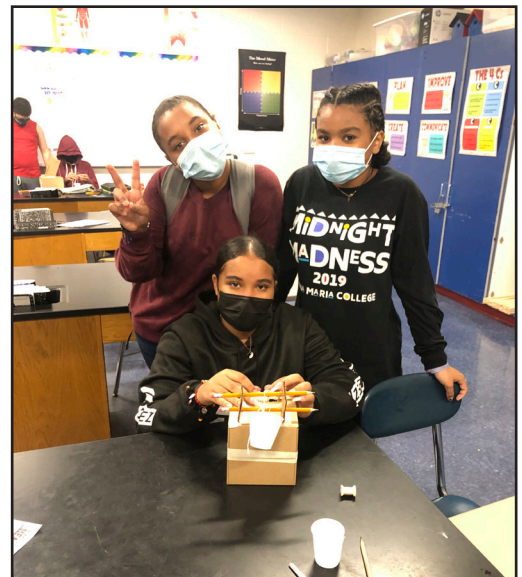
### Calcutt Middle School, Central Falls

Molly MacDonald and Kelly Sierra  
By Calcutt SMILE Club

This year, Calcutt Middle school is home to two SMILE clubs: the 5th grade SMILE club and the 6-8 grade SMILE club. Both clubs have had an exciting year! At the beginning of the year, both clubs were engaging in some engineering projects. The favorite activity for the 5th grade club was the geo-dome building project. Students loved building a structure and then testing the structure out themselves. The favorite activity for the 6-8 grade club was the “cool puppy house” project. Students really enjoyed building an eco-friendly model house for a puppy. Both clubs also went to the Roger Williams Botanical Gardens this winter. All students were able to showcase their knowledge of ecosystems and plants. Overall, this has been a favorite activity for the students this year.

For the second half of the school year, both clubs have been working hard on the material they need to master for the challenge days. The 6-8 grade club worked hard on the engineering bridge building challenges. The club was able to go to the Middle School Challenge weekend and showcase their knowledge to work with their groups to build bridges. The 5th grade club is working hard, studying local ecosystems and ecology of Rhode Island. They are looking forward to Ecology Day at the end of April. Their favorite activity has been dissecting owl pellets.

As we close out the year, the 2 clubs have come together to work on a shared stewardship project. The students are going to be creating some upcycled gifts for teacher appreciation week. It has been a great year for the Calcutt SMILE groups.



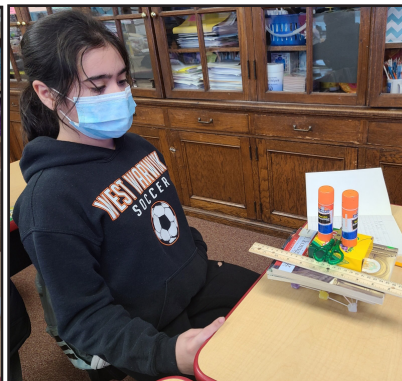
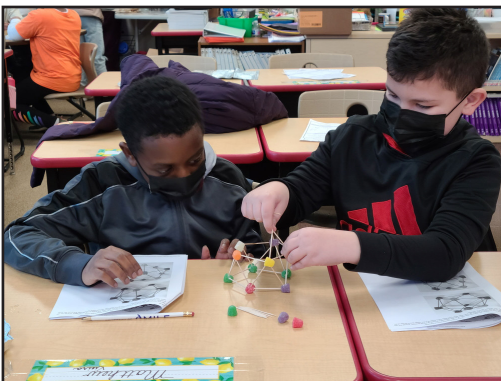


## CLUB UPDATES

### Horgan Elementary School, West Warwick

Maria DePalma, Amy Horne

*By Horgan SMILE Club*



This year has brought us back to our regular schedule of weekly after-school meetings! While we learned to live with virtual meetings on Google meets last year, and the students did a great job of participating at a distance due to the Covid19 pandemic, we are certainly thrilled to be meeting in person again to share our adventures in STEM activities.

The students have participated in a wide variety of science activities this year, in several different fields of study. Geodomes were built that could withstand the weight of a heavy book, from nothing more than gumdrops and toothpicks. Ships were constructed from aluminum foil, then their seaworthiness tested by piling on pennies to determine whose boat was strongest. We learned about data while spinning fidget spinners. Students separated out the different pigments in autumn leaves using chromatography techniques. Using their senses and powers of observation, our student scientists determined the contents of our "mystery bags", and using a Dichotomous Key, were able to verify the flavors of some unusual "Jelly Belly" jelly beans. We've also learned about nature's biomes in activities about food webs, owl pellet dissection, and deer populations.



As we near the end of our SMILE year, we have done a clean-up of our school grounds and have started our stewardship project. In researching the far-reaching effects of plastics in damaging our planet and its inhabitants, we have seen the need to do what we can to help reduce the alarming use of plastics in our daily lives. To this end, each SMILE member will be bringing home a reusable canvas shopping bag, decorated with appropriate pictures and slogans to encourage Recycling, Repurposing and Reusing, in order to avoid damaging our fragile planet. We look forward to giving our students a peek at college life, along with a chance to perform scientific experiments and inquiry, with our knowledgeable URI student mentors when we visit the URI campus at the end of April.



## ECOLOGY FIELD DAY

**"I love nature and when I grow up I want to be a field biologist." -SMILE Student**

On April 29, 2022, 60 SMILE students attended the annual Elementary Ecology Field Day at the University of Rhode Island. Hailing from 4 elementary schools across Rhode Island, the students rotated through four ecology-themed stations, and enjoyed lunch in the dining halls.

They were welcomed by 12 URI mentors who spent the spring semester preparing themselves, creating activities and hands-on lessons to educate the SMILE students about the ecology at the URI campus. SMILE students were easily spotted across campus with their bright red SMILE sweatshirts and colorful baseball caps.

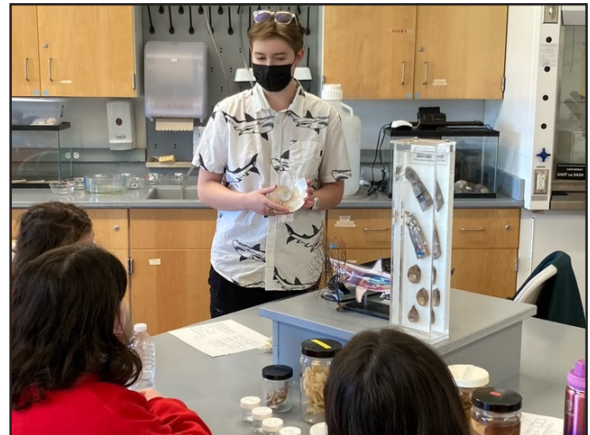
The SMILE students rotated through four different field studies at four different locations on campus.

1. In the vernal pool students had the opportunity to learn about plants and how they are primary producers, and how they contribute to the success and life span of the vernal pool. Finally, students learned the life cycle of spotted salamanders and wood frogs, and they were actually able to see the egg masses of both species. Overall, the students got a well-rounded lesson of what goes on in a vernal pool and how a vernal pool is a special body of water. Mentors also led activities in the greenhouse. There, SMILE students checked out rare plants in the conservatory, and tested soils for permeability.

2. In the pine forest, URI mentors involved the students in learning not only about the trees but also students got to stop and listen to their quiet surroundings. Throughout the lessons the SMILE students learned about tree growth, species ID and more. They estimated the height of a tree using tree circumference, looked under fallen trees for worms, observed how succession had shaped the forest and its microhabitats



Taking a closer look at seaweed under the microscope at the URI marine science lab.



**"I feel more connected to the environment because of all the fun interesting forest facts I learned about." -SMILE Student**



URI students ran the event along with SMILE staff.



## ECOLOGY FIELD DAY

**“I like the activities within the data notebook because of the fun interesting questions they had.” -SMILE Student**

3. At the pond, URI mentors had the students look at different plant life growing in and around the water. SMILE students examined the blooming skunk cabbage and learned about the special characteristics that help it to survive, including the “special smell” that it emits when stepped on! Students also looked at the trash and pollution around the campus’ pond. Mentors led the students in drawing posters to post around campus asking URI students to not litter.

4. Several members from the Society for Women in Marine Science (SWMS) led activities for the Marine Encounters station. During this station, students used a dichotomous key to identify a variety of marine organisms, used microscopes to look at the damage done to coral reefs.

As the day started to wind down, SMILE students said farewell to the URI mentors and headed to the buses with tomato plants in tow to take home and plant. For the majority of the students, this was their first time on a college campus. We can’t wait to see them back on campus again soon!



Exploring life in the vernal pool and asking lots of science questions.



Students observe an array of plants and learn about plant diversity in the URI Greenhouse.





## CLUB UPDATES

### South Kingstown High School

Christina Dube, Amanda Varone  
By South Kingstown SMILE Club

It has been a great year for SMILE here at SKHS! We have a small group of dedicated students who show up and participate every week. We did some fun activities in the fall including an air sampling activity in multiple classrooms throughout the building. It was great to see the students reaching out to other teachers to test the air in their rooms. It was also great to see the members thinking about what the air quality results might be in some of their classrooms. In the Fall, we went on an exciting field trip to the University of Rhode Island Graduate School of Oceanography in Narragansett. We learned more about their new research vessel, the saltwater organisms they study among other interesting topics. During the beginning of 2022, we prepared for the URI Challenge day by studying the five parts of the brain and some of the important functions of those parts. We also completed a materials testing activity to familiarize the students with the materials they would be using to protect their “brains” during the Challenge Day. Lastly, we look forward to a field trip to the Roger Williams Park Botanical gardens in Providence near the end of the school year.



Team reports to all students and teachers on their results and recommendation for materials to be used in building a safer football helmet



Making sensors to attach to the brain hat



## CLUB UPDATES

### Woonsocket Middle Schools at Hamlet and Villa Nova

Michaela Gormley, Ian Chernasky, Michelle Morin, Jenn Hardy

*By Woonsocket Middle School SMILE Clubs*



Both SMILE Clubs at Woonsocket Middle School had been busy preparing for the URI Engineering Challenge Day. SMILE students worked with a partner on creating their truss bridge blueprints with multiple viewpoints. They worked so diligently that they held multiple meetings a week in order to prepare and even pushed back their Report Card Celebration until after Challenge Day. When they finally did have their celebration (part of a movie and popcorn) the after school program came in with a photographer to photograph their engineering work since the beginning of the school year. Ever gracious, the SMILE students showcased their work to the professional photographer and explained their design and how it was tested. The “cool puppy” houses, locker organizers and straw bridges were a bit hit with the after school program leaders.

Challenge Day at URI was amazing! Many of the designs the students made from our club were chosen as the group design for the Truss Bridge Challenge. Many new friends were made and the students loved experiencing “college life.” They especially loved the university student mentors. Woonsocket SMILE Clubs look forward to these experiences each year in SMILE!



Building a truss bridge from their blueprint



Visiting Roger Williams Botanical Center in the outdoor gardens



## PARTNERSHIPS

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:

### CENTRAL FALLS

Calcutt 5th grade  
Kelly Sierra  
Molly MacDonald

Calcutt Middle School  
Molly MacDonald  
Kelly Sierra

Central Falls High School  
Charles Fisher

### NEWPORT

Thompson Middle School  
Candace Lewia

Rogers High School  
Elizabeth Letourneau  
Brooke Anderson

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Peacedale Elementary  
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Katie Nerstheimer

Curtis Corner Middle School  
Anna Stewart-Viera  
Valerie Light

S.Kingstown High School  
Christina Antaya-Dube  
Amanda Varone

### WESTERLY

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Robert Brennan

Westerly High School  
Lesley Fastovsky

### WEST WARWICK

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Amy Horne

Deering Middle School  
Eugene Gallo  
Christopher Baccei

West Warwick High School  
James Owen  
Christopher Baccei

### WOONSOCKET

Citizens Elementary School  
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Jodi Michienzi

Woonsocket Middle School (2 clubs)

Michaela Gormley  
Ian Chernasky  
Michelle Morin  
Jenn Hardy

Woonsocket High School  
Brigette Hernandez  
Ethel Locke

### AAUW

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

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Carol Englander  
Director

Claudia Hoddersen  
Curriculum  
Specialist

Jo Ann Basel  
Assistant Director

Ceryl Swartz  
Accountant

Kaitlyn Czap  
Development &  
Publications Officer

Samantha Johnson  
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#### The SMILE Program

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