

A STEM PROGRAM

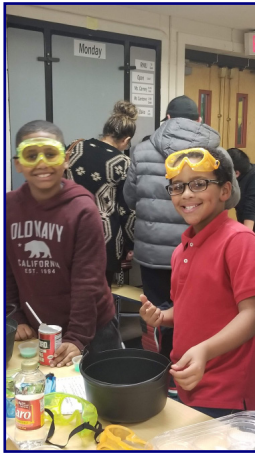
# SMILE

Science and Math Investigative  
Learning Experiences

## Newsletter

volume 26 No.2, May 2020

26\* Years of service



## SMILE STRONG!



Select Photos from SMILE  
Family Science Nights this past  
fall.



With great sadness, SMILE has abruptly cancelled the SMILE URI Middle School Engineering Challenge weekend, the SMILE URI High School Engineering Challenge weekend, the 5th grade Elementary Outdoor Science Adventure weekend at URI's W. Alton Jones Environmental campus, and the 4th grade SMILE URI Ecology day. All our teachers, students and staff were disappointed but realized that the severity and contagiousness of the Covid-19 disease left us with no other health safety option. SMILE staff are currently developing activities for the Fall that will enable SMILE clubs to meet and have educational meaningful weekly after school STEM (science, technology, engineering and math) activities in a safe environment.

Typically SMILE highlights annual events in the spring newsletters. For this newsletter, we will share the awesome STEM experiences of our SMILE clubs, and honor our SMILE seniors. We are extremely proud of our SMILE seniors and wish them every success with their plans going forward. To our SMILE community including students, teachers, families, and supporters - we miss you and are looking forward to exciting and engaging curriculum for next fall!

*Sincerely,*

*SMILE Staff*

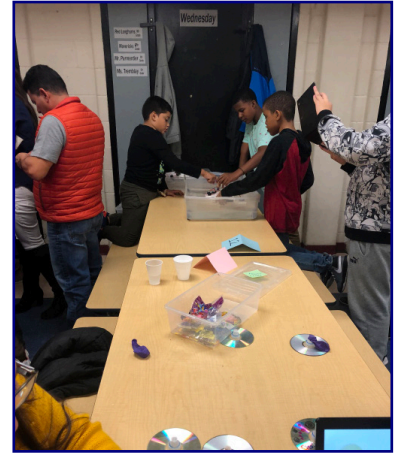
SMILE Program provides the educational outreach for NSF grant awarded to URI professor Rainer Lohman:

Teachers and high school students will learn about the global carbon cycle and conduct experiments. They will investigate "Concentrations and source assessment of black carbon across tropical Atlantic air and sediment". This curriculum and materials will be delivered at the SMILE teachers professional development workshop at the University of Rhode Island in August. Both virtual and actual field trips to the URI Graduate School of Oceanography are being planned.

## Calcutt Middle School (6-8), Central Falls

Molly MacDonald

*By Calcutt Middle School Club*



**Top: Central Falls Family Science Night**

**Left: January Fieldtrip to the Rhode Island Landfill.**

We had a great year in SMILE this year! We were very upset to see it end early. In the fall, we tackled different engineering challenges. Many of these challenges would take several weeks and our focus was on the engineering design process. In our club, we try to complete many rounds of building, always pushing to make the next design better. The club favorite activity was the “motorized boat” activity. We spent a lot of time perfecting our boat designs, racing the boats, and of course, making them look good. During Family Science Night, we enjoyed showing off not only projects from this year, but projects from previous years that we thought our families would enjoy.

Our group was lucky enough to go to the Rhode Island Landfill in January. We teamed up with the 5th grade Calcutt club and about 30 students went and explored the landfill. At the landfill, we learned the “rules” of recycling and we were able to drive to the top of the landfill in the school bus. What an incredible experience! Who knew that so much engineering and thought went into trash! As a follow up activity, we built our own model landfills in our SMILE club later that week. Using food coloring and sand, we tried to make a landfill that did not allow waste to seep into the nearby town’s water supply during rainfall.

At the end of the year, we were learning about different types of bridges and how to build the strongest bridge. We made suspension and truss bridges, learned the importance of using strong shapes and materials in bridge buildings. In our last set of activities, we were building towers from balsa wood and trying to ensure that the structures could withstand an earthquake. We can’t wait to get back into school and meet again!



## Harris Elementary School, Woonsocket

Melanie Clark-Medyesy, Katherine Krause  
By Harris SMILE Club



**Left: Biodomes!**  
**Top , Right, Bottom: Harris Stewardship clean-up.**

The Harris Elementary SMILE Club started off 2020 by designing and making duct tape wallets. This was our final engineering design challenge. We practiced our measuring skills and created prototypes. Students learned that duct tape is a durable, but challenging material to work with. In the end, students persevered and brought home a functional wallet with library card pockets.

During our study of ecology, we created yarn food webs and a water cycle in ziplock bags. The highlight, however, was designing biodomes containing both an aquatic and land habitat. Students dug for worms and added minnows, crickets, and snails to their miniature ecosystems. We researched what each creature needed to survive, and evaluated our biodomes, testing the pH level, as well as temperature, of the soil and water. They were amazing!

Lastly, we kicked off our stewardship project by cleaning up the grounds around the school. Our garbage bags quickly filled up with wrappers, bottle caps, and unidentifiable pieces of plastic and fabric. Harris SMILE students' enthusiasm for helping to keep our community clean was incredible.



A group of students are gathered around a table in a classroom, participating in a science activity. A boy in a grey hoodie is launching a red balloon on a ramp. Other students are watching and holding balloons. A sign in the background reads "Hovercraft (F=ma)" and lists the names of the students participating: "F (Gina + Paul) Kalkstein".



## Woonsocket High School

Ethel Locke, Julia Grassini  
By Woonsocket SMILE Club



Here at Woonsocket High School preparing for the Challenge Weekend is challenging. This year's project was creating a helmet that would provide the most protection for the human skull. The first part of the challenge was investigating the strengths of different materials and how they reacted after being applied with a force. How we tested the various materials was to drop a weight on identical size squares made out of various types of materials, from Plexiglas to Styrofoam. There were 20 different materials in all! We had a particularly difficult time with trying to categorize the damage caused by the weight. Did the material shatter or crack? What did it mean if there was no apparent damage? We were dropping the same weight each time, from the same height at first so we knew the same amount of force was being applied to our squares, but quantifying the damage was hard. We also had a number of materials that did not seem to have any noticeable damage. Did that mean that they had the same ability to withstand a force? Which material was the strongest?

What we figured out was that increasing the height that the weight would fall would also increase the amount of force that was applied to the various materials. This change eliminated a few more materials but not all. We then used our fingers to feel very slight differences in the surface of the squares to detect even smaller amounts of damage.

What we learned from doing this experiment is that it can be hard to quantify results. It is easier to manipulate variables but how to give a number to the effects of those variables is another matter. When we come back in the Fall it will be interesting to learn how scientists deal with those types of problems in a lab.

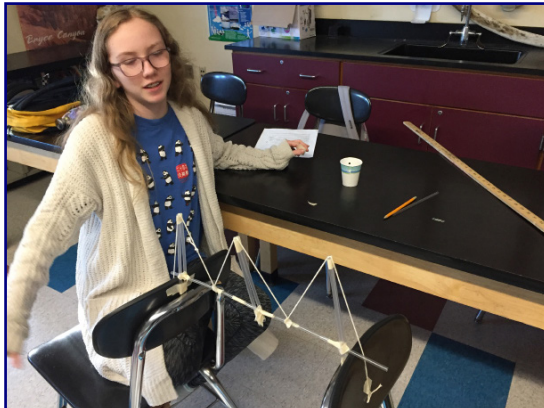
The students were very interested in this investigation for they wanted to know what materials were best so they could use this information when they would need to buy another helmet. They also learned about what injury to certain parts of the brain could result in different medical disabilities such as: perception, temperament, learning abilities, and other results from a head / brain injury. They realized that other activities that result in their head being hit should foster people to wear helmets and that there should be laws to make people wear helmets during these activities. This will keep more people safe, decrease injury, aggressive problems, headaches due to brain injury, and decrease medical costs.

The students also wanted to learn more about how and what scientist use to be able to investigate the resultant damage to the different materials that they could not see with just the human eye or touch. They wanted to use some of these devices and the computer analyzing options. They look forward to going to the Smile weekend to get to experience these techniques, using different processes to analysis, and expanding their experiences.

### Thomson Middle School, Newport

Candace Lewia, Elizabeth Gibbs  
*By Thompson SMILE Club*

Thompson Middle School's SMILE club is in full swing as the three-quarter mark approaches. Our year has been filled with team-work exercises and life skills. The year began with simple engineering challenges like removing a gummy worm off the top of a cup with touching either of them and using nothing but paper clips. We were also challenged with building a boat from the given materials that could travel in a straight line. Of course problems came up in all of the tasks given, but they were overcome with problem solving skills. After a successful family science night, we dug deeper into engineering and reverse engineered a toy car. It was amazing to everyone how a small, simple toy car could have such complex interworking gears under its hood. After finishing up that lesson, we started our bridge unit and began thinking about how a bridge is made. We learned about the various strengths and costs of the different types, materials, shapes and safety features of every bridge. As the time ticks down until the URI trip, we begin to build our towers for the shake table, keeping in mind all the information we have learned in this fun year so far.





## CLUB UPDATES

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### Horgan Elementary, West Warwick

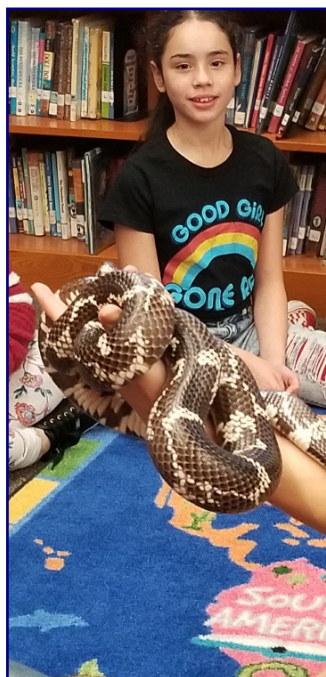
Amy Horne and Maria DePalma

By Horgan SMILE Club



**Above: Family Science Night**

**Right: Roger Williams Zoomobile visits Harris SMILE Club.**



This SMILE year has been full of fun for our club! We began our year with some engineering activities. We built boats that could float and towers from newspapers that could support the weight of a regulation sized basketball! We built marble runs and catapults, using simple materials such as cereal boxes, rubber bands and tongue depressors. We even were able to extract the pigments from fall leaves in a sophisticated leaf chromatography experiment! At our wonderful Family Science Night in November, we shared our presentations and newfound knowledge with family and friends, while enjoying a fabulous array of home-cooked favorites for dinner.

As the year continued, we constructed wallets fashioned from duct tape, with pockets for cash and cards. We even created miniature water cycle models in zipper topped bags that showed the evaporation, condensation, and precipitation of water, using the sun that came through our classroom windows as an energy source. And let's not forget the awesome visit from the Roger Williams Park Zoo's Zoomobile. Our presenter helped us review the concept of Food Webs, and brought along an opossum, a huge millipede and a king snake--right in our own library!!

Despite having our school year shortened, we managed to pack a lot of science into our SMILE meetings, and we are looking forward to more next year!

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## CLUB UPDATES

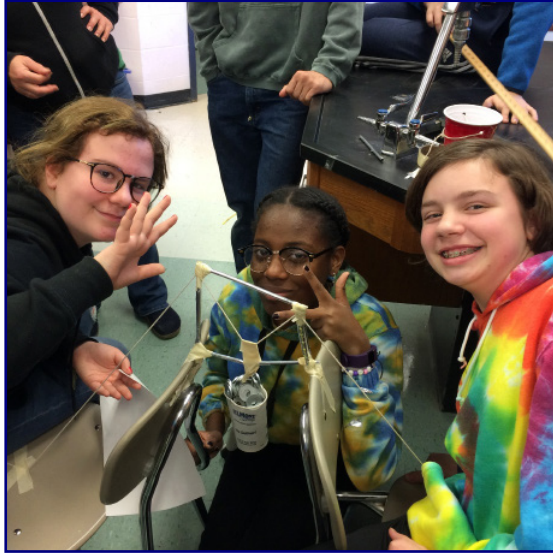
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### Curtis Corner Middle School, South Kingstown

Valerie Light, Brenda Dillmann  
*By Curtis Corner Middle School Club*

#### Curtis Corner Loves SMILE

I love SMILE! In SMILE we are able to learn peer skills and most importantly work with others who also love to learn science. The students in SMILE are interested in learning and fun to be around. In SMILE we have a lot of fun and make new friends. We are getting prepared to solve future problems and we are learning about topics that we wouldn't learn in school. SMILE teaches us things that school doesn't. Hands-on experience in SMILE is a great way to learn science. The teachers in SMILE help us learn new and fun things. We create things we may not think are possible! SMILE has prepared me for my career in science. Ever since I joined SMILE I wanted to be an engineer!



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### South Kingstown High School

Christina Antaya-Dube, Amanda Varone  
*By Nick Pierson*

The SMILE club at South Kingstown High School has grown considerably in recent years. We have grown from less than ten members three years ago to over twenty members this year. So far this year we have studied electricity and circuits, acute measurement, and material manipulation and study. We were also lucky enough to participate in a visit to KVH Industries in Newport, Rhode Island and tour their manufacturing facilities. One interesting activity we completed was creating a battery testing unit. During this lab we researched how batteries work and store energy. We also studied the runoff of energy from its sources and how to prevent it from happening. This lab's goal was to create a model that allowed us to determine the charge of a battery in a simple and efficient manner. Our model consisted of a small cardboard box with transistors, resistors, a diode, and LED lights to indicate the available power inside of a battery. We soldered multiple resistors and wires together to make a complete energy circuit so that the LED lights would turn on. As more LED lights turned on, more charge was available inside of the battery. These models were successful and we showed them off at our annual Family Science Night in the fall. Another great opportunity this year was a visit to Newport's KVH industries in December. This company manufactures satellite and telecommunications devices for commercial use. We were able to embark on a guided tour of their entire manufacturing facility and view each step of the process. We witnessed construction, testing, and applications for each type of machine. In addition, we were able to see the quality control methods and development that each product goes through prior to being made. This was a very interesting field trip and I hope to have more field trips like it in the future. SMILE has been very fun this year and although it was cut short it was still full of fun experiences.

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### Alvarez High School, Providence

Michelle Goewey  
*By Michelle Goewey*

In September, Providence Schools started their first SMILE program at Alvarez High School. Though small, the students have done a lot. In December at Family Science Night, the students showed off their knowledge of gel electrophoresis, soldering and light trickery. Elianna's favorite thing has been building the battery tester, while Darling has enjoyed testing all her senses. Also in December, the students went to Millstone Medical with the SMILE club from Central Falls. While there, they learned about the sterilization techniques for surgical equipment and the engineering that goes into cleaning this medical equipment. Since January, the students have been making hypotheses and testing different materials in preparation for Challenge Weekend.



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### West Warwick High School

Chris Baccei, Eugene Gallo  
*By Grant Black*



This past year during our SMILE program, we undertook many projects that taught us elements of circuitry, the refraction of light, and precise measurement. Our main task this year was testing different materials in order to produce a helmet for the SMILE Challenge Weekend. Along with testing these materials, we were tasked to create organized and accurate spreadsheets of our data and observations. With activities like this, we worked on many objectives such as individual growth, teamwork, and good scientific learning. These activities have allowed the West Warwick SMILE Program to grow and flourish not only within our school, but with our community, coming together to instill the powers of science, math, and technology to our ever growing youth. We look forward to coming together again at our next SMILE Challenge Weekend.

## SMILE SENIORS

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Riley Hebrock, Rogers High School  
URI, Salve Regina, Roger Williams  
Major: Undeclared



Dakota Aguilar, Central Falls  
High School  
RI National Guard and RIC  
Major: Mathematics and  
Education



Janelie Ordenez, Central Falls High  
School  
Roger Williams  
Major: Forensic Science

### **Congratulations to the following SMILE Seniors not pictured above:**

**Mayayi Izzo, South Kingstown High School**  
**Lucas Murphy, South Kingstown High School**  
**Molly Halla, South Kingstown High School**  
**Katelyn Davis, South Kingstown High School**  
**Christopher Daly-Labelle, South Kingstown High School**  
**Berenice Saucedo, West Warwick High School**  
**Amira Aderibigbe, West Warwick High School**  
**Moses Nicolau, West Warwick High School**  
**Carolyn Lussier, West Warwick High School**  
**Oliver Ferris, West Warwick High School**  
**Lucas Corbett, West Warwick High School**  
**Dante Dacosta, West Warwick High School,**  
**Dante Silva, West Warwick High School**  
**Kymera Mcfarlane, Woonsocket High School**  
**Alondra Bermudez, Woonsocket High School**  
**Kiana Garneau, Woonsocket High School**  
**Pilar Almeida, Woonsocket High School**

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## 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:

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Ella Risk Elementary School  
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Calcutt 5th grade  
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Molly MacDonald

Calcutt Middle School  
Molly MacDonald

Central Falls High School  
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Amanda Varone

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Eugene Gallo  
Christopher Baccei

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Jodi Michienzi

Woonsocket Middle School (2 clubs)

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Deana McCarthy  
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Jenn Hardy

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*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.*

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