

Forbes



THE SAMSUNG SOLVE FOR TOMORROW

15

NATIONAL FINALISTS

THEY DESIGNED DRAINS to trap storm water polluting their river; built a solar-powered lighting system to improve safety near their school; grew vegetables in aquaponic beds to provide nutrition for the homeless; and reduced the severity of the European green crab infestation wreaking havoc on their coastal town.

They reached out to civic groups, government officials, engineers and academics. They gathered samples, conducted tests, analyzed results, created prototypes and built websites.

They are the Samsung 15—middle- and high-school teams chosen from a field of more than 2,300 applicants—and they are finalists in the *Solve for Tomorrow* competition. Samsung created

the contest, which is in its fourth year, to raise enthusiasm for science, technology, engineering and math (STEM) education by challenging students to apply classroom learning to solve real-world issues in their local communities.

Earlier this spring, these young innovators and their teachers presented their projects at SXSWedu in Austin, Texas.

Ultimately, five winning schools were chosen—three by a panel of judges, one by Samsung employees and one by an online poll. In total, each school received more than \$140,000 in technology from Samsung and their program partners.



Guarding the Water Supply

Oliver Street School,
New Jersey

To combat the problem of storm runoff polluting their local waterways, the Oliver Street School team studied the system to identify sources. They discovered three overflow chambers dumping garbage into the river, and then set out to design a storm drain to catch the garbage before it entered the system. They built a computer model, and then bought materials and constructed a life-size prototype, which they tested successfully out in the field.



Cooling Off a Region

East Valley High School,
Washington

Motivated to reduce the amount of electrical energy the average local household consumed each summer, the team from East Valley High School designed, built and tested a prototype of a hydro-chill unit—an easy-to-use, energy-efficient air-conditioning system that utilizes irrigation water readily available in their region.



Braving the Storms

El Reno High School,
Oklahoma

The students of El Reno High School wanted to determine the best location for building one or more community storm shelters in the city of El Reno, Oklahoma, which had recently been hit by an F3 tornado. Community shelters would help those who lacked shelters in their own homes, reducing their risk. The students mined historical storm data from the National Weather Service and Oklahoma Climatological Survey to determine the probability and paths of future tornados. They used the information to map out ideal shelter locations throughout the area and presented their findings to local city officials.



Old Smokey's Dirty Secret

**G.W. Carver Middle School,
Florida**



The team from G.W. Carver Middle School took on a long-standing problem in their community: Old Smokey, a former garbage incinerator that had been shut down for decades. The community was worried about possible risks posed by toxins in the soil—the facility is only 20 feet from the school's athletic field, and every day students play near the site. The team got to work analyzing the findings of the city's soil tests, conducting their own tests and interviewing researchers, residents and local officials. They built a website with all their data—as well as with links to newspaper articles and information on toxic chemicals—to bring attention to the matter and inspire city officials to take action.

Taking Care of Crabbiness

**Frank H. Harrison
Middle School, Maine**

The Frank H. Harrison Middle School team focused on mitigating the environmental impact of an invasive species on their local ecosystem. The European green crab, which feeds on juvenile clams, wreaks havoc on the \$11 million-a-year clamming industry, and is destroying the grass in local tidal marshes. The students reached out to the Maine Clammers Association, local lobstermen, town officials and university professors. They collected, organized and analyzed data in order to come to their own conclusions about the magnitude of the problem, and then developed recommendations to share with their community.



Diagnosing a Hospital

**Worcester Technical
High School, Maryland**

The Worcester Technical High School project was a partnership between the school's pre-engineering and biomedical sciences students, who worked collaboratively with their local community hospital to create a redesign of its outpatient and emergency department waiting area. Antiquated and inefficient, it no longer met the needs of patients, their families and the staff. The students analyzed the space, met with hospital officials and engineers, and then created a detailed redesign using sustainable materials. Their plan addressed the need to improve privacy and confidentiality, infection control, efficiency of patient care and security. The students had the opportunity to present their plan to the hospital for consideration.



Fishing for Population Data

**Vermillion Middle School,
South Dakota**

Vermillion Middle School's team examined the invasion of Asian carp in the Missouri National Recreational River and its threat to this historically and environmentally significant waterway. The students brought in experts, such as fish biologists, to learn about the carp's impressive appetite and growth rate as well as control methods, and then they went out and captured, measured and tagged fish for future research. The students helped increase awareness of the problem through social media, media outlets and educational outreach, and advocated for research and development.

Samsung is proud to partner with Adobe Youth Voices (AYV), DIRECTV, Forbes, National Environmental Education Foundation (NEEF) and National PTA®. For more information on the Samsung Solve for Tomorrow education contest, please visit www.samsung.com/solve.



Lighting Up a Community

H.D. Woodson STEM High School,
Washington, D.C.

H.D. Woodson STEM High School's team wanted to improve the safety of their Northeast Washington, D.C., community, and help students and their families feel secure as they traveled through a neighborhood park to and from the school in the evenings. The students surveyed the area using geo-spatial technology and identified ten locations where there was a need for light sources. They built solar cells that could power the lights with a low carbon footprint, and created a plan for configuring and building the system.

Freshening the Waters

New Bridge Middle School,
North Carolina

The New Bridge Middle School project, Operation Oyster, focused on the scope of the devastation to Wilson Bay from a former wastewater treatment plant that had dumped unfiltered sewage into the water many years earlier. The students collected and tested water samples and compared them to 13-15-year-old samples to see how the water quality was improving. In addition, they helped build up an oyster reef around Wilson Island, adding 200 pounds of oyster shells to attract fish and improve water quality in the bay.



Growing and Donating Fresh Produce

King Science and Technology Magnet School,
Nebraska

The students at King Science and Technology Magnet School tackled a problem affecting the "food desert" in their community—an area where affordable and healthy food is difficult to obtain. They developed a plan to use aquaponics, a form of farming that utilizes fish waste to provide nutrients to a soilless grow bed, which yields harvests every four to six weeks. Through their work, the students are able to provide nutrition to local homeless shelters year-round. They have helped develop aquaponic systems throughout their community, including in schools, where they help teach children about sustainable agriculture.

Clearing the Air

Elko Institute for Academic Achievement,
Nevada

The Elko Institute for Academic Achievement project aimed to solve the mystery of the dirty air in the high desert region of Nevada, where the air is generally crisp and pure. The students wanted to analyze the chemical compounds in their precipitation to see if the dirty air contained dangerous chemicals. They worked with government agencies, engineered a prototype of a collection station, attended a college class on acid rain, and ultimately conducted a series of tests on rainwater and snow for acid rain. They documented their precipitation collection methods and processes for measuring its chemical composition.





Blowing Away Alkali

Sunburst Junior High, Montana



The students at Sunburst Junior High tackled an issue plaguing local motorists: alkali from nearby salt flats was blowing across the interstate highway, causing dangerous visibility problems. The students examined the area, dug and tested soil samples, and then created an elevation model of the adjoining farmland, which they determined was contributing to the problem. To help stop the water runoff, which was causing alkali to blow, they met with plant specialists, grew and tested different varieties, and made recommendations to convert the surrounding farmland to alfalfa, making it safer for drivers living in—and traveling through—the area.

Reducing Carbon Footprints

Bailey STEM Magnet Middle School, Tennessee

The students from Bailey STEM Magnet Middle School wanted to help families in their community reduce monthly electric bills as well as their carbon footprint. They researched simple, inexpensive, energy-saving improvements and learned how to calculate kilowatt-hours. Then they tested their findings in a real house to see how much electricity they could save by applying weather stripping, replacing power strips, changing light bulbs and so on. Afterward the students developed an app for the community showing how people could save money, presented their findings to the public and appeared on a national news show.



Earthquake Protection

Sandcreek Middle School, Idaho

The students from Sandcreek Middle School, located in the shadow of the Yellowstone supervolcano, wanted to know the risk of catastrophic earthquakes in their area as well as ways to mitigate their effects. They conducted research to identify faults, looked up building codes and considerations in engineering and architecture, and built simple monitors to record ground motion. To apply what they learned, the students constructed a building model and tested it on an earthquake table to demonstrate how modifications might reduce damage from an earthquake.



Finding the Safest Route

Academy at Palumbo, Pennsylvania



The Academy at Palumbo team focused on mitigating the risk to students who must walk through dangerous neighborhoods to get to and from school, and they set out to create a system to determine the safest possible routes. The team developed a survey to measure student travel patterns, mapped out the information they collected, plotted points correlating to real crime data, and created an algorithm to rate the safety of each route. At the end they created a website to communicate the most efficient and safest options to the community at large.

