BEST ROBOTICS

BOOSTING ENGINEERING SCIENCE & TECHNOLOGY

BEST ROBOTICS 2019

Boosting Engineering Science and Technology

What is BEST?

BEST at Auburn University is a Science Technology Engineering and Mathematics (STEM) education and workforce development program for middle and high school students that promotes 21st century skills. BEST stands for *Boosting Engineering Science and Technology*, and is a national program with fifty local competition sites in eighteen states. It is administered by BEST Inc, a 501c3 non-profit organization, that sets curriculum and competition standards. The mission of BEST is to inspire students to pursue careers in science, technology, engineering, and mathematics through participation in a competitive robotics program that fosters knowledge, teamwork, and communication. A major tenet of the program is that it is free to schools; there is no cost for robotics materials nor to enter a team.

Each year, middle and high school student teams are tasked with building a robot to compete against other schools in that year's challenge. Each challenge is based on an educational model. Last year's theme, Current Events, was developed and executed by the Southeastern Center of Robotics Education (SCORE) at Auburn University and challenged BEST teams to design and build a robot that could harvest specific types of plastic pollution from ocean gyres and construct an artificial reef. The robotics competition is a high-energy sports-like environment, but good sportsmanship is essential. Student-driven robots compete against the challenges of the game, not other robots. Each year's game theme and playing field is revealed in mid-September. Teams are given six weeks to design and build their robot before entering their local competition. Local competitions are held in October. The top teams advance to one of four regional championships. The eastern region's championship, South's BEST, is hosted by Auburn University.

In addition to robotics, the most coveted award of the program is the BEST Award. To compete, students must provide an engineering notebook, give an oral marketing presentation, construct an educational exhibit, and show excellent team spirit and sportsmanship. BEST uses the excitement of robotics to teach engineering and business processes.

BEST is a premier program of the Southeastern Center of Robotics Education (SCORE). SCORE is a STEM education resource for K-12 schools across Alabama and beyond. SCORE serves to inspire and prepare future generations of STEM professionals by developing and delivering student robotics programs and competitions, online robotics resources, and professional development for educators. SCORE programs include BEST Robotics, VEX Robotics, Mission 100, summer camps, and much more. To learn more, please visit www.scoreau.org

S.C.O.R.E.
SOUTHEASTERN CENTER OF ROBOTICS EDUCATION

What is the 2019 competition theme? - Off the Grid

Beyond food, air, and water, it could be said that there is one commodity that is essential to enable our civilization. It surrounds us, we use it countless times day and night, yet we rarely think about it. Then a natural disaster takes it away from us, and it is one of the highest priorities for us to get back.

Electricity is generated in many different ways and transported all over the world via a high voltage distribution network. Carefully managed supplies and loads make sure it is available at the flip of a switch, until it isn't. With over 200,000 miles of high-voltage transmission lines and over 5.5 million miles of local distribution lines, in just the U.S. alone, disruptions are inevitable. When those disruptions affect thousands of miles of grid, like they did with hurricane Maria in Puerto Rico in 2017, anything that can help get the grid back up faster is invaluable.

Our linemen have the most dangerous job in the world. Disaster areas are the most dangerous of all because of live high voltage wires that have fallen to the ground and the substantial debris and obstacles that exist after such an event. A new type of lineman is needed to repair the power grid. Working with robots, the new generation of linemen will act as pilots/drivers and interact with the robot by loading payloads and equipment to be installed on the grid.

BEST Robotics is looking for an all-purpose system to repair the electric grid when catastrophe happens. Maintenance and repair of the power grid is one of the more dangerous occupations, so this year's Off The Grid challenge to BEST teams is to help mitigate this problem by designing a robotic system to repair aerial high voltage lines, residential lines and underground buried cables; to transport and replace line insulators and transformers; and to clear and remove ground debris such as trees and limbs.

Game Objectives

Design and build a robot capable of working with a lineman to perform the following tasks:

- Clear debris from roadways and dispose of the debris safely.
- (Re-)Attach power lines to transmission line towers and residential poles.
- Tension the attached Transmission lines.
- Install residential transformer(s).
- Install substation transformer(s)
- Install electrical conduit in underground trenches.
- Transport transmission line insulators to linemen in the field.

How did BEST start?

The idea for a student robotics program originated in 1993, when two Texas Instruments (TI) engineers served as guides for TI's Engineering Day. Together with a group of high school students, they watched a video of freshmen building a robot at the Massachusetts Institute of Technology. The students' enthusiasm for the video inspired the TI engineers to develop a robotics competition for middle and high school students. With enthusiastic approval from TI management, North Texas BEST was born.

The first competition was held in 1993 with 14 schools and 221 students. In 2001, the first competition in the South was held on Auburn's campus. Today, there are over 1,000 teams nationally with over 22,000 students, 1,800 teachers, and over 4,000 volunteers.

Why is BEST needed?

In the Twentieth Century, the first airplane took to the skies, the first mass-produced automobile rolled off the assembly line, and man walked on the moon. None of that would have been possible without engineering, science, and math – or even more fundamentally, an inquisitive drive, critical thinking, and problem solving. Despite exponential growth in the past, engineering and technical disciplines are losing the youth that will be responsible for carrying the field further.

According to the National Center for Education Statistics (a division of the Department of Education), 68.6 percent of high school students plan to obtain a bachelors degree or higher, and according to Harris Interactive, only 34 percent of high school students wish to pursue STEM careers.

To make the Twenty-first Century better than its predecessor, a greater investment must be made in STEM education programs for middle school and high school students.

BEST Inc. solves the aforementioned problem by addressing the issue at a fundamental level – make STEM education fun. We accomplish this through student self-direction and competition. Competition creates passion; which is why the Wright Brothers flew, Henry Ford built the Model T, and Neil Armstrong walked on the moon.

Beyond robotics, the competition in the engineering design process, marketing, educational exhibits, and spirit and sportsmanship is where students achieve their educational advancement. We use the excitement of robotics as a catalyst for overall educational and workforce development, and we have been successful. Over 91 percent of BEST students say the program has increased their interest in math, science, and/or engineering. BEST is also a diverse program with nearly 4 out of 10 BEST students being female.

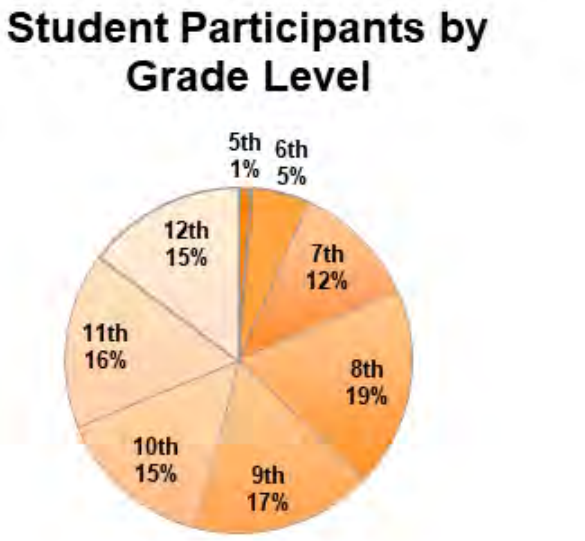
As a middle and high school program, BEST is targeted to students at the right stage of their educational development. According to a Microsoft-sponsored study by Harris Interactive, 78 percent of STEM college students said they decided to study STEM in high school or earlier and 21 percent decided in middle school or earlier.

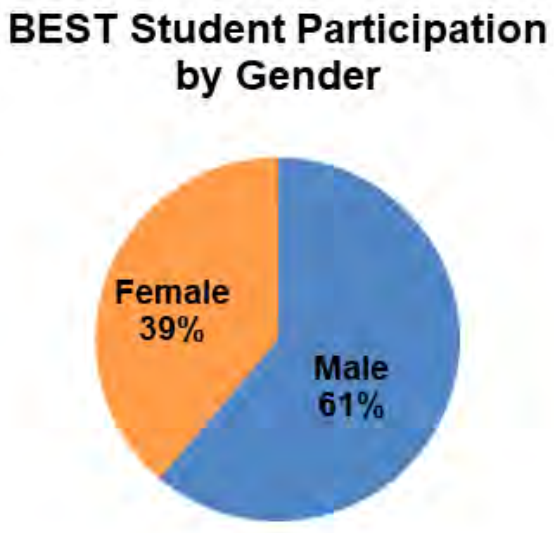
BEST provides students with relevant industry knowledge, critical thinking, exposure to higher education, and the aptitude to succeed.

Who participates in BEST?

The numbers and geographic scope of students who attend BEST at Auburn University varies. South's BEST is a regional competition and features nearly seventy teams from Tennessee, Mississippi, Georgia, Florida, and Alabama. In 2018, 60% of teams were from Alabama due to the program's large presence in the state. Approximately 2,000 students in grades 5 - 12 attended the South's BEST competition at Auburn University. The following charts and graphs detail a sampling of those students.

Middle school students account for roughly 37%of South's BEST teams; with roughly 63% being in high school.





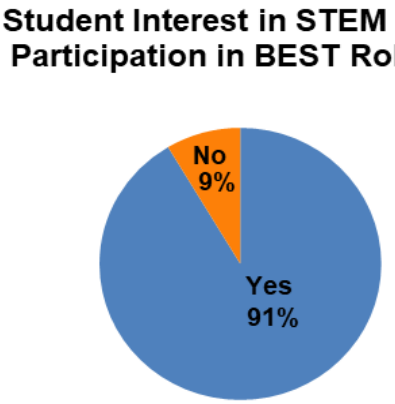
Gender participation remains fairly consistent from year-to-year with roughly 39%female, and 61% male.

How are these students impacted?

Our surveys show that the longer a student is involved in BEST, the greater their appreciation for math, science, and/or engineering. In the process, these students gain critical thinking and problem-solving skills they will carry with them regardless of their chosen profession.

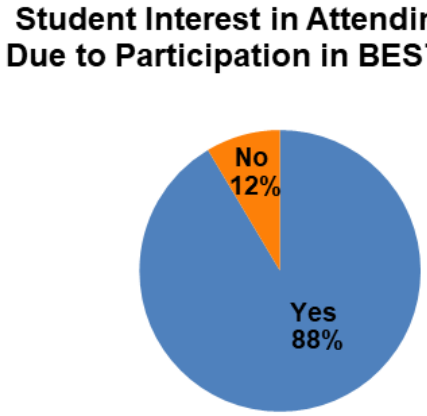
Over 91% of BEST students say they have an increased interest in math, science, and/or engineering because of the program.

Has participating in the BEST Program increased your interest in the fields of math, science, and/or engineering?



The most telling example of program success is in college attendance. 89% of BEST students surveyed said they plan to attend a college or university. The national average for high school students is generally around 68%. The chart below illustrates survey response at the 2018 South's BEST Championship.

Do you intend/ want to go to college?



Of those planning to attend college, 36.83% of students indicated they are interested in pursing a degree in Engineering/Computer Science. Sciences and Mathematics (including health and medical related fields) accounted for 38.84% of fields indicated by students.

What is the program budget?

BEST 2019 Estimated Expenses	Amount
Playing Fields (2)	$1,000.00
Office Supplies for competition (judges notebooks, pens, nametags)	$1,000.00
Facilities - Rental equipment (tables, chairs, linens, recycling)	$1,300.00
Facilities - Staffing at event (custodial service, operations)	$8,000.00
Event Space Rental fee - Coliseum Operations Management	$1,650.00
Event Production - Sound Source Productions, Inc.	$48,500.00
Program Announcer - Russell J. Knorr/Allen Landers	$1,000.00
South's BEST Trophies	$450.00
South's BEST Plaques	$1,000.00
South's BEST Hub Signs	$1,000.00
South's BEST T-Shirts	$1,200.00
Judges Gifts	$1,000.00
Meals - Volunteers, Judges, Staff Food, Drink, Snacks, Refreshments	$9,000.00
Office of Information Technology Data Charges	$90.00
Event Programs/Guides	$400.00
EMT Services for event	$260.00
Storage Unit for competition materials	$1,550.00
Security at event	$1,600.00
Total	$80,000.00

*Does not include program administrators' salary allocation or outreach program infrastructure

How is BEST funded?

BEST is free to schools. Providing the venue, materials to build the robots, and the competition and educational models, requires corporate and foundation support. A donation to BEST isn't just a gift, it's an investment in the education and future of tomorrow's technology leaders. BEST at Auburn University is fortunate to be supported by such great organizations as:

Donaldson. Filtration Solutions

Auburn and Opelika Tourism Bureau

HYUNDAI HYUNDAI MOTOR MANUFACTURING ALABAMA

BRIGGS & STRATTON

VWR FOUNDATION Assisting Science, Supporting Health & Education

NEPTUNE TECHNOLOGY GROUP

VisualEdge Robotics www.visualedgeinc.biz Alabama's VEX Reseller

BRASFIELD & GORRIE GENERAL CONTRACTORS

Southern Company

AUBURN UNIVERSITY

NORTHROP GRUMMAN

BOEING

Sponsorship Levels

Each sponsorship level is tailored to a specific organization's interests and objectives.
In general, sponsorship levels are as follows:

Presenting Sponsor, $15,000+
Allotted to only one donor, the presenting sponsor will receive all benefits in the Atom sponsor level, as well as naming recognition. All printed and promotional pieces will include the company's logo. Ads will run on event screens at South's BEST. The company logo will be displayed on prominent signage on the game floor at the South's BEST competition.

Atom Sponsor, $10,000 – $14,999
Exhibit space at the competitions will be available. Atom sponsors will also be able to design a new award or name an existing one. Logo featured on competition t-shirts, all printed event materials, the game field, displayed on event screens at South's BEST, printed in the event program, and displayed on competition websites and social media. Company information may be provided for inclusion in the teacher's information packet. Branded items may be donated for attendees. All-access passes to South's BEST, including hospitality.

Gear Sponsor, $5,000 – $9,999
Logo featured on competition t-shirts, the game field, displayed on event screens at South's BEST, printed in the event program, and displayed on competition websites and social media. Gear sponsors will also be able to design a new award or name an existing award with a multi-year commitment. Company information may be provided for inclusion in the teacher's information packet. Branded items may be donated for attendees. All-access pass to South's BEST, including hospitality.

Tiger Sponsor, $1,000 – $4,999
Logo featured in event program and on competition websites and social media. Company information may be provided for inclusion in the teacher's information packet. Branded items may be donated for attendees. All-access pass to South's BEST, including hospitality.

*Donations to BEST at Auburn University are tax-deductible gifts made through the Auburn University Foundation.

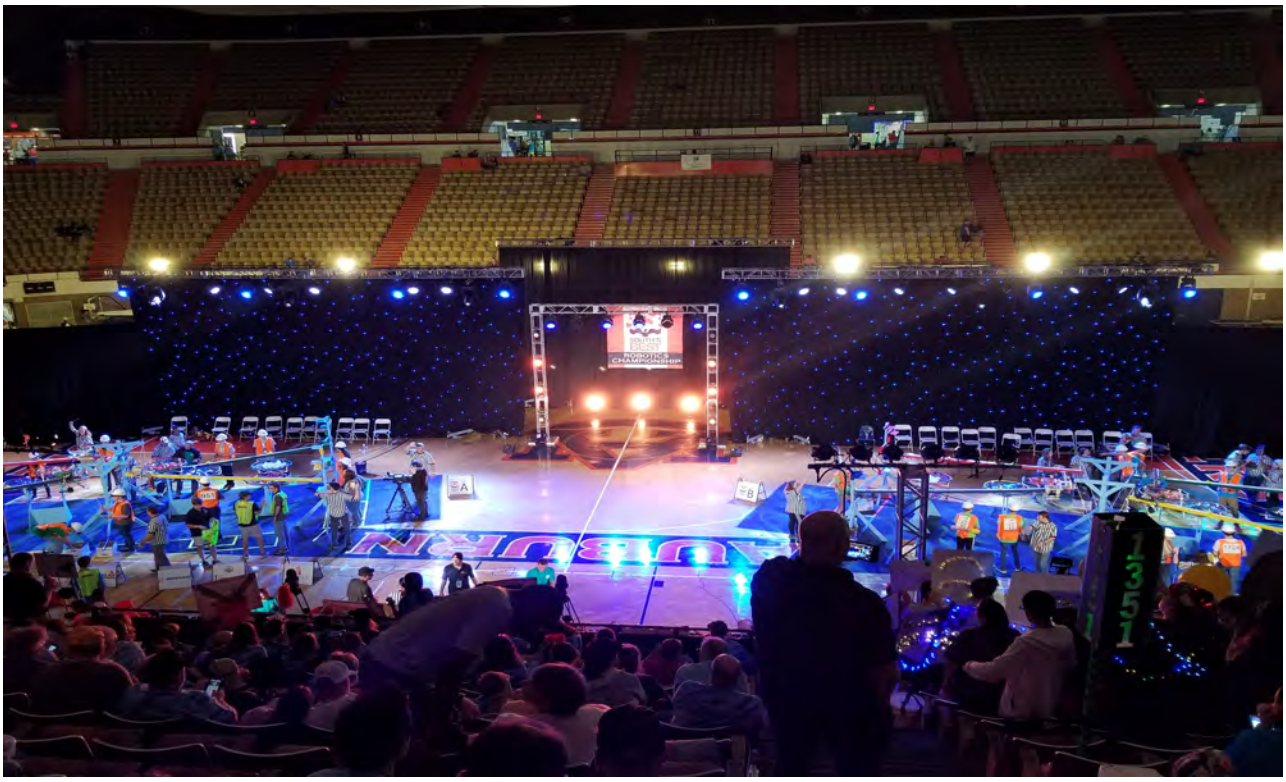
What do sponsorship branding opportunities look like?

While the focus of BEST at Auburn University is on program support for students' educational advancement, we strive to provide as much benefit to those who support the program as possible. We encourage our constituents to support the companies who support us. With over 4,000 South's BEST attendees, BEST competitions host a strong segment of the industry's current and future leaders in students, parents, teachers, and volunteers.

Field signage varies per year based on the game theme, but opportunities for logo placement are available at each competition.

Logo images, videos, or commercials may be displayed on the event screens at South's BEST.

Hundreds of t- shirts are produced for South's BEST each year.



Thank you for your consideration and support.

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