

ANNUAL REPORT

2017

College of Sciences and Mathematics Outreach

The College of Sciences and Mathematics Outreach Office at Auburn University strives to promote scientific literacy and interest among K-12 students, teachers, and communities in our region, our state, and our nation.



22

on-site programs



154

contact days



10,297

students, parents, and teacher participants

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COSAM Outreach Highlights 2017



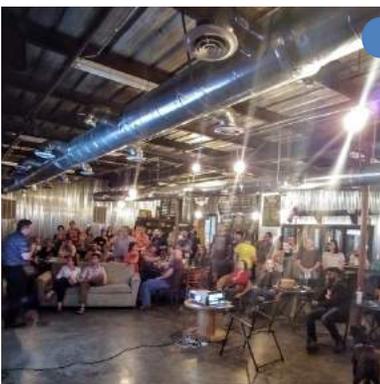
COSAM Outreach took on both the middle school and high school **State Science Olympiad** competitions! More than 700 students competed at Auburn this Spring in these competitions.



Our Project Lead The Way (PLTW) division started a new program called "**Biomed Day**" giving PLTW students exposure to biomedical careers related to various AU departments.

We added a new location to our Science Café program – Red Clay Brewery in Opelika. Our opening night of this new "**Science Pub**" had more than 300 attendees!

Check out some of our new programs and achievements!



"AU Explore" has been revamped into a new program called **Destination: STEM!** This event brought over 1,700 middle and high school students to campus!

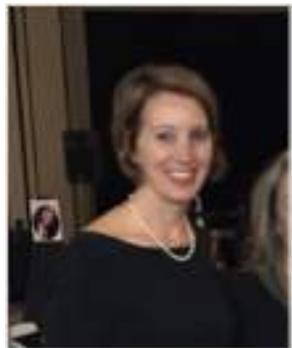


Outreach Staff



Mary Lou Ewald
Director of Outreach

As the Director of Outreach for the College of Sciences and Mathematics, Mary Lou's primary responsibilities include: oversight and management of the outreach programs, the Director of AU Science in Motion, SCORE, Co-PI of AU-AMSTI, and the campus-wide outreach representative for COSAM (WISE Institute, Outreach Faculty Engagement Council). In addition, she is responsible for oversight of all grant-related activities for the unit and serves as the State Affiliate Director of the Project Lead The Way program.



Kristen Bond
Assistant Director of Outreach

Kristen's responsibilities during the 2017 year included: coordination of elementary and middle school Science Olympiads, Science Matters Summer Academy, Middle School AMP'd, SWSM, as well as school coordination and logistics at both the War Eagle BEST and South's BEST competitions.



Teddy Dubose
Account II

Teddy's primary responsibility included managing program budgets, office management, and oversight of all financial matters of the unit.



Josh King
Outreach Administrator

Josh's responsibilities during the 2017 year included: coordination of GUTS, the PLTW State Conference, PLTW Biomed Day, High School AMP'd Challenge, GEARSEF, Science Café, team communication for BEST robotics, and serving as the affiliate assistant director for the Project Lead The Way Biomedical Sciences program.

Outreach Staff (cont.)



Tj Nguyen

Assistant Director of SCORE Robotics

Tj Nguyen is the Assistant Director of SCORE. He coordinates and runs robotics outreach programs through SCORE such as Drone Camp, BEST Robotics, and VEX Robotics.



Frank Ware

Robotics Education Specialist

Frank Ware is the Office Manager of SCORE and robotics instructor. He keeps the robots at SCORE in working order in addition to teaching and instructing student camps and teacher workshops. He specializes in Ozobots instruction with our elementary students.



Dr. Charles Eick

Affiliate Assistant Director of PLTW Launch and Gateway

Dr. Eick's responsibilities during the 2017 year included: coordination of the PLTW state conference, coordination of Summer and Winter Launch and Gateway PLTW core trainings, teacher visitations and school support, and coordination of other PLTW supplemental professional development offerings.



Janie Marino

STEM-IQ Project Assistant

Janie's responsibilities during the 2017 year included: coordination of STEM-IQ professional development, logistics, mentoring, and program evaluation, and assisting with the GEARSEF program.

Student Employees



Emily Hardy

STEM-IQ Graduate Student Assistant

Emily's responsibilities during the 2017 year included: coordination of STEM-IQ professional development, logistics, mentoring, and program evaluation, and assisting with the GEARSEF program.



Jessica Gilpin

Graduate Student Program Assistant

Biology

Phd Student

First year in COSAM Outreach



Khori Dunn

Student Program Assistant

Interdisciplinary Studies

Senior

Fifth year in COSAM Outreach



Jacob Varner

Student Program Assistant

Software Engineering

Senior

Fifth year in COSAM Outreach

Student Employees (Cont.)



Erika Dunavant
Student Program Assistant
Building Science
Senior
Third year in COSAM Outreach



Hunter Whitten
Student Program Assistant
Building Science
Senior
Fifth year in COSAM Outreach



Hunter Terry
S.C.O.R.E. Student Program Assistant
Aerospace Engineering
Sophomore
Second year in COSAM Outreach



Nia Perkins
S.C.O.R.E. Student Program Assistant
Electrical Engineering
Second Degree Student
Second year in COSAM Outreach

Student Employees (Cont.)



Grace Denniston

Student Program Assistant

Industrial Design

Sophomore

First year in COSAM Outreach



Marcus Woodard

Student Program Assistant

Software Engineering

Senior

First year in COSAM Outreach

2017 Outreach Calendar

Science Café	Jan 31, Feb 25, Apr 20, May 25, June 27, Jul 27, Aug 29, Sep 28, Oct 17
Elementary Science Olympiad	February 4
GEARSEF	March 9
Spring GUTS	March 23 and April 11
State MS Science Olympiad	April 1
State HS Science Olympiad	April 1
High School AMP'd	April 22
SWSM	May 4
STEM IQ	May 1 – 2 (Cohort 1), and June 27 – July 1 st (Cohort 2)
Pave The Way	June 1 – 2, January 20 – 21
FLIP	June 20
Science Matters	June 5 – 9, 12 – 16, 19 – 23, 26 – 30; July 17 – 21, 24 – 28
Science in Motion Training	June 5 – 30, July 18 – 21
PLTW Core Training	Jan 4 – 6, June 5 – July 21
PLTW Supplemental Training	Jan 6 – 7, June 10, July 17 – 21
Summer Science Institute	June 11 – 17
AP Summer Institute	June 19 – 22, July 10 – 13, July 17 – 20
Destination STEM	September 22
War Eagle BEST	October 8
PLTW Biomedical Day	November 2
Fall GUTS	November 16
South's BEST	December 3 – 4

Program Descriptions



Alabama STEM Studio for Afterschool Learning

Funding Source: Truman Pierce Institute Grant

TASSAL (The Alabama STEM Studio for Afterschool Learning) is a statewide afterschool STEM professional development program hosted by COSAM Outreach. The initiative utilizes a series of hands-on, inquiry based activities that integrate science, technology, engineering and mathematics principles in a fun, non-threatening learning environment. The target audience is afterschool educators located at 21st Century Community Learning Centers (CCLC) in Alabama.



AP Summer Institute (COSAM Facilitated)

Funding Source: Participant fees

The AP[®] Summer Institute (APSI) Workshop is endorsed by College Board and designed to aid the professional development of teachers, counselors, and administrators who are involved with Advanced Placement (AP[®]) courses. Workshops are designed for teachers who are teaching an Advanced Placement course for the first time and for experienced teachers desiring refresher training. Topics include subject matter content, test construction, pupil and teacher selection, College Board policies and procedures, and preparation and grading of AP tests. APSI is hosted each summer in partnership with the Office of Professional and Continuing Education at Auburn University. COSAM facilitates course offerings in Biology, Chemistry, Physics, Statistics, Calculus, and History.



Auburn Mathematical Puzzle Challenge

Funding Source: COSAM, participant fees

The Auburn Mathematical Puzzle Challenge, or AMP'd Challenge for short, is a mathematics and problem solving challenge hosted by Auburn University. Each year, AU hosts a middle school and high school event in which teams of 6–8 students work together to ‘solve a crime’ by solving thematic mathematical puzzles.



Destination STEM

Funding Source: COSAM

Destination STEM (previously “AU Explore”) is COSAM’s annual Open House Day for 6th - 12th graders. Students have the opportunity to experience live animals up close, as well as interact with University faculty and students at the Science and Math EXPOs, Make-n-Take Science Fun Shops and Demo Shows presented by Auburn’s finest.

Program Descriptions



FLIP Teacher Training

Funding Source: AL Math Science Partnership Grant, State Dep. of Education

The FLIP (Flipped Learning and Instruction in Physics) project aims to support teachers in developing the necessary skills, knowledge and beliefs to effectively implement research based inquiry instruction using flipped/inverted approaches in high school physics courses. The 2-year professional development program, funded by a Math Science Partnership grant from the AL State Department of Education, emphasizes content mastery, pedagogical knowledge and the use of professional learning communities (PLC).



Getting Under The Surface (GUTS)

Funding Source: Participant fees

GUTS is a program for kids in grades 1-6 and their parents or grandparents as lab partners. Each evening session includes dessert followed by a 90-minute science activity featuring a “Getting Under The Surface” theme that focuses on a scientific topic or technique.



Greater East Alabama Regional Science & Eng. Fair

Funding Source: COSAM, Samuel Ginn College of Engineering, & fees

GEARSEF is a regional affiliate fair of the Intel International Science and Engineering Fair (Intel ISEF), the world’s largest international pre-college science competition. ISEF, the premiere science competition in the world, annually provides a forum for millions of students from over 50 countries, regions, and territories to showcase their independent research. GEARSEF hosts 6th – 12th grade projects from 19 Southeast Alabama counties. Two exceptional high school students from GEARSEF advance to the Intel ISEF each May to compete against the top 1,500 students in the world for nearly \$4 million dollars in prizes and scholarships.



Pave The Way

Funding Source: AL Math Science Partnership Grant, State Dep. of Education

In order for teachers to teach the new AL content standards successfully with the needed increase in rigor, to incorporate the mathematics practice standards, and to affect student achievement, quality professional development experiences are needed to both deepen content and pedagogical knowledge at all levels of the K-12 spectrum. The Pave The Way teacher training furthers teachers’ skills in STEM content and pedagogy at grades 3, 4, and 5 by applying research-based practices and emphasizing project-based learning as an outcome.

Program Descriptions



Project Lead The Way

Funding Source: Participant fees

Auburn University serves as the Project Lead The Way (PLTW)'s engineering and biomedical sciences affiliate university for the state of Alabama. In this role, Auburn University facilitates the delivery of the PLTW Pathway to Engineering, Biomedical Sciences, Launch, and Gateway to Technology programs by providing professional development through its core training and counselor conferences, as well as college-level recognition, program initiatives, and statewide/regional support and communication. Project Lead The Way at Auburn University is a collaboration between the WISE Institute and the College of Sciences and Mathematics.



Science Café

Funding Source: COSAM

Science Café is a monthly recurring community outreach night of science, good drinks, tasty sweets, and great conversations. At the AU Science Cafe, participants have the opportunity to sit down and talk about new and exciting science and technology with STEM experts in our community, all the while relaxing in a great local food and drink venue. The event is free and open to the public of all ages.



Science Matters

Funding Source: Participant fees

Science Matters is a summer enrichment program for elementary students offering youngsters a supercharged science experience. The program allows participants to explore the world of science through authentic experiments, local field trips, constructive play, technology, art projects, and hands-on, make-n-take activities. Each summer, up to eighteen different one-week courses are designed and taught by master educators in the region.

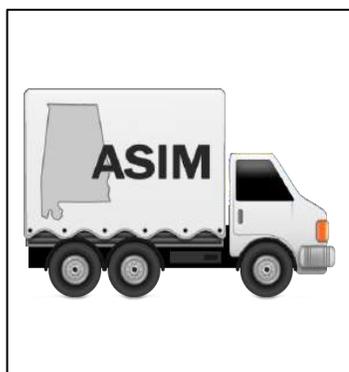


Science Olympiad

Funding Source: COSAM, AU Bookstore

Science Olympiad is a national science competition that is organized as a one-day academic track meet, consisting of up to 24 different competitive events. Each spring, Auburn University hosts a regional competition for elementary students as well as the overall State competition for middle and high school students.

Program Descriptions



Science in Motion

Funding Source: State Department of Education

Alabama Science in Motion (ASIM) is the high school science component of the Alabama Math, Science and Technology Initiative. ASIM is a partnership between universities and high schools in Alabama. The goals of Science in Motion are to provide high-tech laboratory experiences for students and effective professional development for teachers. In many instances the cost of the equipment involved would be prohibitive for individual schools or even systems to acquire. Sharing this equipment through Science in Motion offers equally enriching opportunities to students from different backgrounds and schools.



SWSM

Funding Source: Sponsorships and Participant Fees

The annual Society of Women in Sciences and Mathematics (SWSM) Symposium and Luncheon offers women at all stages of their careers in science and mathematics the opportunity to network with one another through panel discussions, break-out sessions, career corner, and a luncheon with Keynote address from the Marie W. Wooten Distinguished Speaker.



STEM-IQ

Funding Source: National Science Foundation Grant

STEM-IQ is a program for middle and high school teachers that focuses on aiding students through the science and engineering fair project design process. The program is funded through a National Science Foundation, EPSCoR Track III grant. Participation in this program is by invitation and is limited to school systems interested in participating in AU's regional Science and Engineering Fair.



Summer Science Institute

Funding Source: NSF, SWSM, Daniel Foundation, & COSAM Outreach

The Summer Science Institute at Auburn University is a summer science program for rising 11th-12th grade students with a high aptitude and interest in the fields of science and math. The program partners students with experienced AU Science and Math research faculty to explore topics more advanced than what is typically taught in a public or private high school environment. Students are chosen based upon their academic merit through a rigorous application process.

Program Descriptions



War Eagle BEST

Funding Source: Sponsorships, COSAM and Samuel Ginn College of Engineering

War Eagle BEST is the local BEST Robotics hub for schools located in East Central Alabama and West Georgia. The program is co-hosted by the College of Sciences and Mathematics and the Samuel Ginn College of Engineering at Auburn University. Each fall ~25 local schools design, build, and program a robot from a kit of raw materials through implementation of the Engineering Design Process. The six-week-long program culminates in a one-day, sports-like competition.



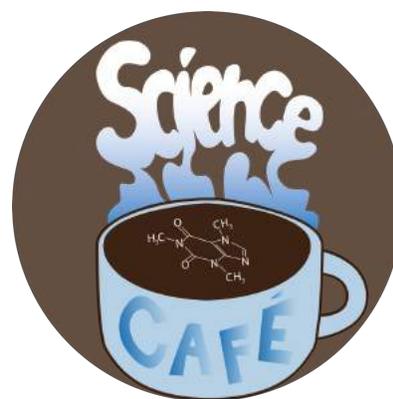
South's BEST

Funding Source: Sponsorships, COSAM and Samuel Ginn College of Engineering

Each December, a crowd of over 3,500 students, teachers, parents, and industry mentors assemble at Auburn University for the Annual South's BEST Regional Robotics Championship. Winners from 16 Southeastern BEST hubs advance to South's BEST, where the "Best of the BEST" compete in two intense days of competition.

Program: Science Café & Pub**Date:** Monthly Recurring Program**Description:** Monthly community science presentation and discussion night featuring local scientists**Facilities:** Mama Mocha's Coffee Emporium & Red Clay Brewery**Personnel:**AU: Josh King, Erika Dunnivant, Khorizon Dunn, Mary Lou Ewald, Grace Denniston, Marcus Woodard, and various presenters**Impact:**Total Audience Attendance (11 nights): 870Grade Range: All ages**Presenters:**

- Dr. John Gorden – Jan 31 – “Alchemy and Infamy”
- Dr. Jason Bond – Feb 23 – “Do Spiders Have Super Powers?”
- Dr. David Cline – Apr 20 – “Tomorrow’s Lunch is Underwater”
- Dr. David Maurer – May 25 – “Some Like it Hot: Fusion, the Energy of the Future”
- Morgan Beadles – Jun 27 – “Vampires, Man-eaters, and Other Botanical Oddities”
- Dr. Charles Savrda – Jul 27 – “Trace Fossils: Dino Tracks, Trilobite Trails, & Worm Burrows”
- Dr. Kelli Thompson – Aug 29 – “Is Orange Really the New Black?”
- Dr. Matt Grilliot – Sep 28 – “An ‘Itchy’ Situation: Bats, White Noses, and a Terrible Fungus”
- Dr. Chandana Mitra – Oct 17 – “Heat of the Moment: Are Cities Getting Hotter?”



Program: Science Olympiad- Elementary School (Division A2)

Date: Saturday, February 4, 2017

Description: Regional Elementary School Olympiad

Personnel:

AU: Mary Lou Ewald, Kristen Bond, Teddy Dubose, Josh King, Hunter Whitten, Hannah James, Frank Ware, Hunter Terry, TJ Nguyen, Jacob Varner, Erika Dunavant, Khorizon Dunn. Students from Tau Beta Pi, AED, NSBE, Honors Serves, CEGS, AOE, SWE, and IEEE.

Non-AU: Science teachers from participating schools

Schools Impacted: Beulah Elementary, Highlands Elementary, W.O. Lance Elementary, Mt. Gap Elementary, Ogletree Elementary, Pick Elementary, Oakgrove Elementary, Auburn Classical Academy, Wrights Mill Rd. Elementary, Yarbrough Elementary, Springwood School, LaFayette Eastside Elementary, Montana Street Magnet School, Fairhope Intermediate School, North Highlands Elementary, Prattville Christian Academy, West Forest Intermediate School, Concord Elementary, Irondale Community School, Montgomery Catholic, and Thompson Intermediate

Total Number of Students: approx. 517

Age Range: 3rd – 6th grade

Facilities: AU Student Center, Parker Hall, Sciences Center Labs, Sciences Center Classroom Building, Sciences Center Auditorium, Student Activities Center

Program: Greater East Alabama Regional Science and Engineering Fair (GEARSEF)**Date:** Thursday, March 9th, 2017**Description:** Students presented projects from a variety of Science and Engineering fields.**Personnel:**

AU: Mary Lou Ewald, Josh King, Janie Marino, Emily Hardy, Kristen Bond, Teddy Dubose, Jacob Varner, Khorizon Dunn, Hunter Whitten, Hunter Terry, Frank Ware, Hannah James, Nia Perkins

Judges:

College of Sciences and Mathematics: Ms. Shaliah Armstrong, Dr. Adriana Avila Flores, Dr. Nickolas Backscheider, Mr. Roger Birkhead, Ms. Teri Briggs, Ms. Alex Combs, Dr. Ryan Comes, Mr. Drew Daymond, Mr. Gen Dong, Dr. Byron Farnum, Dr. Zach Farris, Ms. Jessica Gilpin, Dr. Christian Goldsmith, Dr. Luca Guazzotto, Mr. Taylor Hall, Mr. Curtis Hansen, Dr. Greg Hartwell, Mr. Ethan Hiti, Mr. Shawn Jacobsen, Mr. Nick Klann, Ms. Rebecca Koch, Dr. Allen Landers, Dr. Tim Mitchell, Dr. Kimberly Mulligan, Mr. Bennett Paradis, Mr. Nick Parr, Mr. Phil Pearson, Ms. Jenna Pruett, Ms. Susan Rashid, Mr. Cody Rasmussen-Ivey, Dr. Elizabeth Schwartz, Dr. Stephanie Shepherd, Ms. Breanna Siple, Ms. Sammi Smoot, Mrs. Kay Stone, Dr. Christine Sundermann, Ms. Mary Szoka, Mr. Michael Tassia, Dr. Haruka Wada, Ms. Maya West, Ms. Kat West, Mr. Yuxiang Zheng, Dr. Paul Cobine

Samuel Ginn College of Engineering: Dr. Sushil Adhikari, Dr. Asha-Dee Celestine, Dr. Selen Cremaschi, Dr. Virginia Davis, Mr. Joseph Ekong, Mrs. Morgan Ellis, Mr. Garon Griffiths, Mrs. Elise Hall, Mr. Stats Hogeland, Mr. Rohit Kanungo, Ms. Jenna Klemkowsky, Mr. Kyle Kubik, Mr. Kyle Lusk, Mr. Animesh Mondal, Mr. Matthew Noor, Ms. Haixin Peng, Dr. James Radich, Dr. Vrishank Raghav, Ms. Bahareh Ramezan pour, Dr. Brian Thurow, Mr. Alexander Tsekouras, Mr. Armin VahidMohammadi, Dr. Alexander Vinel, Mr. Michael Vrtis, Ms. Xiaohan Zhang, Ms. I-Hsuan Chen

College of Education: Ms. Dianna Forbes, Mr. Nick Soltis,

College of Agriculture: Dr. Sang Wook Park

100 Women Strong: Ms. Haley Porter, Ms. Krysta Weed

U.S. Air Force: Lt. Col. Jeffrey Welborn

U.S. Navy: Captain Willie Billingslea

Northrop Grumman: Mr. Dustin Deshazo, Mr. Dana Hickey, Mr. Paul Sherrod

School of Forestry and Wildlife Sciences: Ms. Megan Bartholomew, Mrs. Pratima Devkota

**Sponsoring Auburn University Organizations:**

Junior Division

100 Women Strong, AU Department of Chemistry and Biochemistry, AU Department of Geosciences, AU Department of Physics, Samuel Ginn College of Engineering Award Office of the Dean, AU Department of Biological Science, AU College of Sciences and Mathematics Office of the Dean, the National Oceanic and Atmospheric Administration (NOAA), Society of Hispanic Professional Engineers (Auburn Student Chapter), AU Department of Mathematics and Statistics, United States Air Force, AU Society of Women in Sciences and Mathematics, the Office of Naval Research

Senior Division

American Psychological Association, ASU Walton Sustainability Solutions, 100 Women Strong, AU Department of Chemistry and Biochemistry, AU Department of Geosciences, AU Department of Physics, Samuel Ginn College of Engineering Office of the Dean, AU Society of Women in Sciences and Mathematics, AU Department of Biological Sciences, AU College of Sciences and Mathematics Office of the Dean, Mu Alpha Theta, Ricoh Sustainable Development, AU Society of Hispanic Professional Engineers, Stockholm Water Foundation, AU Department of Mathematics and Statistics, United States Air Force, the Office of Naval Research, NASA, AU Project Lead The Way, ASM Materials Education Foundation, Genius Suny Oswego, Yale Science and Engineering Association

Total Number of Students: 240 students presented 190 projects (top 41 projects advanced to state)

Age Range: 6th-12th grade

Schools Impacted: Ashford Elementary School, Auburn High School, Auburn Jr. High School, Autaugaville School J H, Beverlye Magnet School, Carroll High School, Carver Magnet School, Central High School (Phenix City), Central High School (Lowndes County), Coppinville Junior High School, D. A. Smith Middle School, Dothan High School, Eclectic Middle School, Elmore County High School, Geneva Middle School, Girard Middle School, Greenville Middle School, Harrand Creek Elementary, Hayneville Middle School, Lowndes County Middle School, McKenzie High School, Northview High School, Opelika Middle School, Phenix City Intermediate School, Redland Elementary School, Slocomb Middle School, Stanhope Elmore High School, The Calhoun School, Wacoochee Elementary School, Wetumpka High School, Wetumpka Middle School

Facilities: Auburn Hotel and Conference Center



Program: Greater East Alabama Regional Science and Engineering Fair (GEARSEF) Teacher Training

Date: Thursday, September 22, 2017

Description: A one-day training for 32 new teachers to GEARSEF was provided at the Auburn Chamber of Commerce.

Personnel:

AU: Mary Lou Ewald, Josh King, Janie Marino, Emily Hardy, Jessica Gilpin

Program: Getting Under the Surface (G.U.T.S) – Spring (March)

Date: Thursday, March 23rd, 2017; 6:00 pm - 8:30 pm

Description: Parent/Child teams act as lab partners in a 75-90 minute science activity.

Logistics:

AU Personnel: Josh King, Hunter Whitten, Chloe Josefson, Erika Dunavant, Amber Holmes, Lydia Moore, and Philip Schult

Non-AU Personnel: Gina Watkiss and Emily Antoniak

Schools Impacted: N/A

Total Number of Students: 24

Total Number of Parents: 24

Age Range: 1st-6th Grade

Facilities: SCL 310, SCA, SCC 122 & SCC 115



Course: The Tinged, Singed Woods (1st-3rd)

Did you know that Alabama is host to a tree that doesn't mind getting a little burnt? Join us for an exploration of the unique animals and plants that live among the fantastic Longleaf pine forests. Learn why fire can sometimes be a good thing, explore the ecology around flora that lives for hundreds of years, and never look at the woods the same way again!

Age Range: 1st-3rd grades

Developed by: Lydia Moore and Philip Schult

Number of Students: 5

Average Student Satisfaction Ranking: 5 (out of 5)

Average Parent Satisfaction Ranking: 5 (out of 5)

Course: Tropical Takeover

If you could build a rainforest, how would YOU make it? Join us for a tropical takeover of all that goes into a rainforest, why they are important, and all the weird and wacky creatures that live there.

You'll get the chance to design your own rainforest using scientific principles and even take a little bit of it home with you!

Age Range: 1st-3rd grades

Developed by: Emily Antoniak

Number of Students: 9

Student Satisfaction Ranking: 5 (out of 5)

Parent Satisfaction Ranking: 5 (out of 5)

Course: Bug Wars (4th-6th)

Do you have what it takes to save the world from a virus? And what if you had to infect it instead? In this puzzle-filled course, your mathematical and critical thinking skills will be put to the test in a bug-eat-bug world of challenges brought to you by the tiniest of the world's creatures!

Age Range: 4th-6th grades

Developed by: Amber Holmes

Number of Students: 5

Average Student Satisfaction Ranking: 4.3 (out of 5)

Average Parent Satisfaction Ranking: 3.6 (out of 5)

Course: Spring Fling (4th-6th)

From bubbles and waves to beach sand and sun tan lotion – let's get ready for Spring Break and the beach! Of course, with Miss Gina they'll be something Slimy too!

Age Range: 4th-6th grades

Developed by: Gina Watkiss

Number of Students: 5

Average Student Satisfaction Ranking: 4.8 (out of 5)

Average Parent Satisfaction Ranking: 5 (out of 5)



Program: Science Olympiad - Middle School (Division B)

Date: Saturday, April 1, 2017

Description: State Middle School Olympiad

Personnel:

- AU: Mary Lou Ewald, Kristen Bond, Teddy Dubose, Erika Dunavant, Khorizon Dunn, Hannah James, Josh King, Nia Perkins, Hunter Terry, Frank Ware, Hunter Whitten
- Non-AU: Science teachers from participating schools

Schools Impacted: Alabama School of Fine Arts, Auburn Junior High School, Baldwin Arts and Academics Magnet, Bragg Middle School, Brewton Middle School, Excalibur Christian School, Fultondale High School, Hewitt-Trussville Middle School, JF Drake Middle School, Monrovia Middle School, Our Lady of the Valley School, Prattville Christian Academy, St. Joseph Catholic School, Trinity Presbyterian School

Total Number of Students: approx. 210

- Age Range: 6th – 9th grade

Facilities: AU Student Center, Beard-Eaves Memorial Coliseum, Haley Center, Parker Hall, Sciences Center Auditorium, Sciences Center Classrooms, Sciences Center Laboratory, Student Activities Center



Program: Science Olympiad - High School (Division C)**Date:** Saturday, April 1, 2017**Description:** State High School Olympiad**Personnel:**

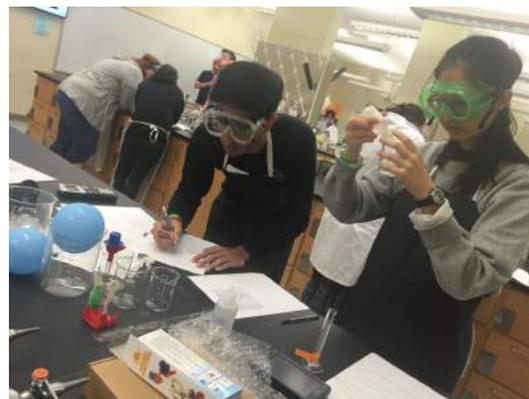
- AU: Mary Lou Ewald, Kristen Bond, Teddy Dubose, Erika Dunavant, Khorizon Dunn, Hannah James, Josh King, Nia Perkins, Hunter Terry, Frank Ware, Hunter Whitten
- Non-AU: Science teachers from participating schools

Schools Impacted: Alabama School of Fine Arts, Alabama School of Math & Science, Auburn High School, Fultondale High School, Gardendale High School, Grissom High School, Hueytown High School, Jefferson County International Baccalaureate, LAMP High School, Randolph School, Sparkman High School, St. John Paul II Catholic High School, Vestavia Hills High School, Wetumpka High School

Total Number of Students: approx. 210

- Age Range: 9th – 12th grade

Facilities: AU Student Center, Beard-Eaves Memorial Coliseum, Parker Hall, Sciences Center Auditorium, Sciences Center Classrooms, Sciences Center Laboratory, Student Activities Center



Program: Getting Under the Surface (G.U.T.S) – Spring (April)

Date: Monday, April 11, 2016; 6:00 pm - 8:30 pm

Description: Parent/Child teams act as lab partners in a 75-90 minute science activity.

Logistics:

AU Personnel: Josh King, Hunter Whitten, Frank Ware,
TJ Nguyen, Dr. Elaine Coleman, Chloe Josefson,
Nia Perkins, Hunter Terry

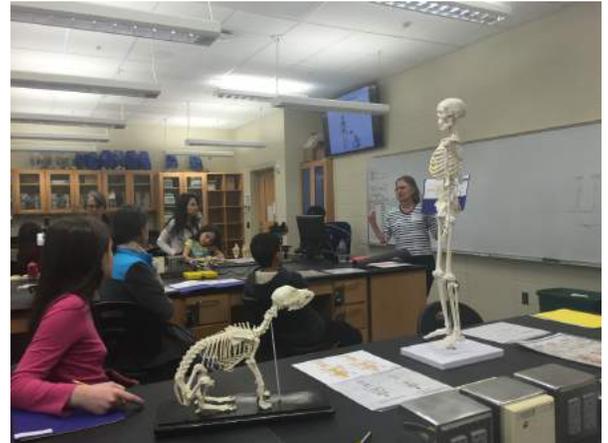
Schools Impacted: N/A

Total Number of Students: 34

Total Number of Parents: 34

Age Range: 1st-6th Grade

Facilities: SCL 310, SCC 122 & 115, SCA



Course: Germ Wars (1st-3rd)

Did you know that every table top, every hand rail, every surface can be a battle zone for tiny, little microbe fighters? And while we normally think of germs as what make us sick, germs also have to worry about their own well-being. Join us to learn how a little friendly germ competition leads to how the flu spreads and also the helpful bacteria you've never heard of!

Age Range: 1st-3rd grades

Developed by: Chloe Josefson

Number of Students: 9

Average Student Satisfaction Ranking: 4.72 (out of 5)

Average Parent Satisfaction Ranking: 4.75 (out of 5)

Course: Atomic Automations

The superheroes Atom and the Ant Man could shrink themselves down to incredibly small sizes, even to sizes smaller than the atom! And now with advancing medical technology, robots are beginning to follow the same path as the Atom. Join us in Atomic Automations as we enter the world of nanotechnology and our miniature medical miracles enter the blood stream to detect and treat disease within the circulatory system.

Age Range: 1st-3rd grades

Developed by: Frank Ware

Number of Students: 7

Student Satisfaction Ranking: 5 (out of 5)

Parent Satisfaction Ranking: 5 (out of 5)

Course: Battle of the Bones (4th-6th)

Think you could make it as a crime scene investigator? Then you best brush up on your bones! In Battle of the Bones, we will be putting your knowledge to the test — from the microscopic matrix that makes bones to the large-scale identification of some mystery specimens! Join us for a hands-on tutorial on the make-up, classification, and analysis of the structures that hold you up each day!

Age Range: 4th-6th grades

Developed by: Dr. Elaine Coleman

Number of Students: 6

Average Student Satisfaction Ranking: 4.9 (out of 5)

Average Parent Satisfaction Ranking: 5 (out of 5)

Course: Medical Dash (4th-6th)

Help! There was an explosion at a local chemical factory and it's too dangerous to send in the police and firefighters to save the factory workers. Luckily, the city just ordered new robots! However, the shipment just came in and they haven't been programmed yet. We need your help to program the robots and save the factory workers!

Age Range: 4th-6th grades

Developed by: TJ Nguyen

Number of Students: 7

Average Student Satisfaction Ranking: 5 (out of 5)

Average Parent Satisfaction Ranking: 5 (out of 5)



Program: High School Auburn Mathematical Puzzle Challenge (AMP'd)

Date: Saturday, April 22, 2017

Description: Math Puzzle Challenge event for high school students

Facilities: Sciences Center Auditorium, Parker Hall

Personnel:

AU: Josh King, Kristen Bond, Jacob Varner, Hunter Whitten, Hannah James

Non-AU: Eric Harshbarger

Student Impact:

Number of Students: 120

Grade Range: 9th-12th

Schools Impacted:

- Auburn High School
- Beauregard High School
- Beulah High School
- Central Educational Center
- First Baptist Opelika Christian
- Lee-Scott Academy
- Montgomery Catholic School
- Newnan High School
- Opelika High School
- Saint James School
- Springwood High School



Program: SWSM Women's Leadership Symposium**Date:** Thursday, May 4, 2017, 8:00 AM – 1:30 PM**Description:** High School girls, SWSM supporters, AU faculty, and students attend an annual symposium consisting of a panel discussion, break-out sessions, Career Corner, and luncheon with keynote speaker**Personnel:**

AU: Mary Lou Ewald, Kristen Bond, Teddy Dubose, Josh King, Erika Dunavant, Jacob Varner, Hunter Whitten, Khorizon Dunn, Hunter Terry, Hannah James, Frank Ware, Tj Nguyen, Sherri Rowton, Brook Moates, Tammy Hartwell, Leisa Coleman

Facilities: The Hotel at Auburn University & Dixon Conference Center**Total Number of Students:** 87**Age Range:** 9th-12th Grade**Schools Impacted:**

Auburn High School
 Beulah High School
 Childersburg High School
 Lanett High School
 Montgomery Catholic Preparatory School
 Opelika High School
 Russell County High School
 Tallassee High School

**Panelists:**

Emily Hardy, Chemistry
 Kelsey Ulmer, Mathematics and Statistics
 Khorizon Dunn, Interdisciplinary Studies
 Victoria Roberson, Biomedical Sciences

**Breakout session leaders:**

Beverly Childress, Pre-Health Advising
 Brittany McCullough, Mathematics and Statistics
 Emily Hardy, Chemistry
 Lakedria Fuller, Regional Admissions Advisor
 Khorizon Dunn, Interdisciplinary Studies
 Dr. Kimberly Mulligan-Guy, Director for COSAM Office of Diversity and Multicultural Affairs

Career Corner:

- Amanda Savrda, Geosciences
- Amy Grilliot, Biology and Microbiology
- Annie Gorden, Chemistry
- Ashley Hill, Mathematics and Statistics
- Beth Beason-Abmayr, Biology
- Haruka Wada, Biology
- Karen McNeal, Geosciences
- Kelsey Ulmer, Mathematics
- Mary Beth Lloyd, Chemistry and Biochemistry
- Rebecca Godwin, Biology
- Sarah Nunnelly, Biomedical



Distinguished Speaker: Audrey Goins Brichi – Retired, Former Manager of Diversity and Inclusion in Chevron’s Office of Global Diversity, Ombuds, and University Partnerships



Program: STEM-IQ Teacher Fellow Workshop

Description: The objective of STEM-IQ, a 5-year National Science Foundation funded initiative, is to advance teachers' motivation and ability to lead science fair projects and to test the hypothesis that improving science fair participation will enhance teachers' ability to lead scientific inquiry and enhance the quality and diversity of the STEM pipeline in Alabama. Specifically, we aim to develop a professional learning community that links Auburn University STEM faculty with 6th – 12th grade students, teachers and administrators, facilitated through the Auburn University College of Sciences and Mathematics Outreach Center. We will use existing science fair infrastructure as a framework to provide teacher professional development and enhance the STEM pipeline for students from Southeastern Alabama.

Project Goals:

- To establish a network of STEM teachers and area administrators that advocate for students to engage in research experiences and give teachers the tools they need for classroom implementation.
- To develop a culture of participation in science and engineering fairs in Southeastern Alabama.
- To increase the number of students from underrepresented groups in rural Alabama participating in high quality, meaningful science and engineering research projects.
- To increase positive student attitudes towards STEM through interactions with university research mentors who serve as role models for the students.
- To build a sustainable relationship between Auburn University and regional public schools.

This year, COSAM Outreach provided three STEM-IQ Fellows workshops – a 2-day workshop for continuing training of our Cohort 2 fellows, a 5-day workshop for our Cohort 3 fellows, and a 1-day workshop for our Cohort 3 fellows. The Cohort 2 workshop went deeper into the process of organizing and running a science fair at one's own school, how to get students involved in science fairs, and continuing support on inquiry and science literacy skills. The theme for Cohort 2 was learning from the first year and improving. The Cohort 3 workshop provided an overview of the Science Fair system and equipped the Cohort 3 teachers with further skills in project and inquiry based learning, information on how to mentor students on a science fair project, and other key topics with the goal of starting a science fair at their schools. The one day workshop focused on pacing and starting the science fair process for Cohort 3.

Date: Wednesday, May 31st – Thursday, June 1st (Cohort 2) & Monday, June 26th – Friday, July 2nd (Cohort 3), Friday September 22nd, 2017 (Cohort 3)

Facilities: AU Sciences Center Laboratory building, AU Sciences Center Classroom building

Personnel:

Mary Lou Ewald (COSAM Outreach), Janie Marino (COSAM Outreach), Emily Hardy (COSAM Outreach), Josh King (COSAM Outreach), Roger Birkhead (ASIM), Allen Landers (Physics), Virginia Davis (Chemical Engineering), Paul Cobine (Biology), Tim Mitchell (Biology), Joni Lakin (College of Education)

Impact:

Number of Participants:

- Cohort 2:
 - 12 teachers from the following schools: Carroll High School, Central Freshman Academy, Central High School, D.A. Smith Middle School, Harrand Creek Elementary, Opelika Middle School, Phenix City Intermediate
- Cohort 3:
 - 15 teachers from the following schools: Smiths Station Jr. High, Central Freshman Academy, Lanett High School, Smiths Station High School, Admiral Moorer Middle School, Pike Road School System, West Smith Station, South Girard Middle School, Wacoochee Elementary School.

Program: Pave the Way Robotics**Dates:** June 1-2, January 20-21**Facilities:** AMSTI**Description:**

With Alabama's adoption of the College and Career Ready Standards for Mathematics and the adaption of new science standards in Fall, 2016, ongoing support of teacher growth in both content and pedagogy is of the utmost importance. In order for teachers to teach the new content standards successfully for the needed increase in rigor, to incorporate the mathematics practice standards, and to affect student achievement, quality professional development experiences are needed to both deepen content and pedagogical knowledge at all levels of the K-12 spectrum. Science, Technology, Engineering, and Mathematics content and pedagogy will be addressed at grades 3, 4, and 5 by applying research-based practices and emphasizing project-based learning as an outcome.

Personnel:

AU: Mary Lou Ewald, Kristen Bond, Tj Nguyen, Jacob Varner, Frank Ware

AMSTI: Beth Hickman, Seth House, Wayne Strickland

Impact:

10 teachers attended from the following schools in Alabama for the January 20-21 training:

Wacoochee Elementary School
 East Smiths Station Elementary School
 Loachapoka Elementary School
 Beulah Elementary School

7 teachers attended from the following schools in Alabama for the June 1-2 training:

Wacoochee Elementary School
 Reeltown High School
 Bearegard Elementary School
 Loachapoka Elementary School
 East Smiths Station Elementary School
 West Forest Intermediate School

Program: Science Matters

Dates:

- Monday, June 05-Friday, June 09; 8:00 AM – 4:00 PM
- Monday, June 12-Friday, June 16; 8:00 AM – 4:00 PM
- Monday, June 19-Friday, June 23; 8:00 AM – 4:00 PM
- Monday, June 26-Friday, June 30; 8:00 AM – 4:00 PM
- Monday, July 17-Friday, July 21; 8:00 AM – 4:00 PM
- Monday, July 24-Friday, July 28; 8:00 AM – 4:00 PM

Facilities: Parker 352, Parker 354, Parker 356, Natural History Museum, Auburn University Regional Airport, Donald E. Davis Arboretum, School of Fisheries, Samuel Ginn College of Engineering

Description: Science Matters is a summer enrichment academy in which elementary and middle school children attend themed weeks filled with experiments, field trips, and make-and-take projects.

Personnel:

- AU: Kristen Bond, Erika Dunavant, Jacob Varner, Khorizon Dunn, Teddy Dubose, Maya Thomas, Meredith Kelsoe, Marcus Woodard, William Tidmore, Maya Bien, Hannah James
- Non-AU: Aleesa Zutter, Catina Day, Kenzie Strickert, Heather Cowell, Rachel Martin, Julie Price, Shelley Patterson, Bruce Zutter, Danielle Grubb, Nicole Engleman, Gina Watkiss, Andrew Click, Rob Harlan, Brittney Duncan

Statistics:

- Total Number of Student Places Filled: 366/370
- Capacity: 98%
- Total Number of Students: 158 students
- Age Range: rising 1st-8th grade

Courses:

Monday, June 5 - Friday, June 9

Farm Fresh

Instructor: Aleesa Zutter

- Grades: 1 – 2
- Total Number of Students: 22

Super Sleuth

- Instructor: Julie Price
- Grades: 3 – 4
- Total Number of Students: 24

Secret Formulas

- Instructor: Gina Watkiss
- Grades: 5 – 6
- Total Number of Students: 23



Monday, June 12 - Friday, June 16*Mystery at the Museum*

- Instructor: AU Natural History Museum
- Grades: 5 – 6
- Total Number of Students: 20

Monday, June 19 - Friday, June 23*Opposites Attract*

- Instructor: Kenzie Strickert
- Grades: 1 – 2
- Total Number of Students: 22

Bugs and Blossoms

- Instructor: Rachel Martin
- Grades: 3 – 4
- Total Number of Students: 24

Off the Grid

- Instructor: Bruce Zutter
- Grades: 5 – 6
- Total Number of Students: 14

Monday, June 26 - Friday, June 30*Snap It*

- Instructor: Kenzie Strickert
- Grades: 1 – 2
- Total Number of Students: 22

Crack the Code

- Instructor: Shelley Patterson
- Grades: 3 – 4
- Total Number of Students: 24

Balloon Poppers

- Instructor: Andrew Click
- Grades: 5 – 6
- Total Number of Students: 23

Adept at Adaptation

- Instructor: AU Natural History Museum
- Grades: 7 – 8
- Total Number of Students: 11



Monday, July 17 - Friday, July 21

Wonder of Weather

- Instructor: Rachel Martin
- Grades: 1 – 2
- Total Number of Students: 22

Up in the Air

- Instructor: Bruce Zutter
- Grades: 3 – 4
- Total Number of Students: 24

Pondering Potter

- Instructor: Brittney Duncan
- Grades: 5 – 6
- Total Number of Students: 22

Monday, July 24 - Friday, July 28

Sense & Ability

- Instructor: Aleesa Zutter
- Grades: 1 – 2
- Total Number of Students: 22

Rock and Roll

- Instructor: Nicole Engleman
- Grades: 3 – 4
- Total Number of Students: 24

3,2,1 Blast Off!

- Instructor: Rob Harlan
- Grades: 5 – 6
- Total Number of Students: 23



Program: Summer Science Institute

Support: All expenses are covered for SSI students thanks to support from the COSAM Outreach office, the National Science Foundation, the AU Physics Department, and the Society for Women in Sciences and Mathematics.

Dates: Sunday, June 11- Saturday, June 17, 2017 (residential)

Description: This summer science program is open to outstanding 11th-12th grade students interested in science and mathematics and reside in Alabama or Georgia. Spots in the program were limited to 18 (10 females and 8 males) and were granted on an academically competitive basis. During the institute, students engaged with real-world applications and practitioners of science, performed experiments using cutting edge research equipment, and partnered with COSAM researchers to gain lab skills not taught in high school.

Personnel:

Counselors: Jacob Varner (Software Engineering), Jessica Gilpin (Biological Sciences), Maya Bian (Chemical Engineering, University of Tennessee), Marcus Woodard (Software Engineering)

COSAM Faculty and Staff: _____

Department of Biological Sciences: Dr. Paul Cobine, Shawn Jacobsen, Dr. Mary Mendonca, Dr. Aaron Rashotte

Department of Chemistry and Biochemistry: Dr. Anne Gorden, Dr. Steve Mansoorabadi, Dr. Konrad Patkowski, Dr. Brad Merner

Department of Geosciences: Dr. Stephanie Shepherd

Department of Physics: Dr. Dave Maurer, Dr. Allen Landers, Dr. Mike Fogle, Dr. Uwe Konopka, Dean Nicholas Giordano

Additional AU faculty/staff: Mary Lou Ewald (Director of COSAM Outreach), Beth Yarbrough (COSAM Student Services)

Impact:

Total Number of Students: 18 students

Age Range: rising 11th-12th grades

Counties Impacted:

Alabama: Baldwin, Calhoun, Chambers, Clarke, Cullman, Elmore, Lee, Mobile, Montgomery, Shelby, St. Clair, Talladega

Georgia: Coweta

Facilities: SCC, SCL, Rouse Life Sciences Building, Leach Science Center, Allison Hall, Student Center,

Hill Dormitories

The 2017 Summer Science Institute hosted 18 highly motivated, high achieving students who were chosen to participate by a competitive application process. The students were also selected based on interest in science, mathematics, and Auburn University. The average ACT score of the participants was **31.6**, with a range of 27 to 35. During the first evening of the program, the students completed a short, informational pre-program survey. On the last day of the program, all of the 18 participants responded to a 29 question survey. The following section highlights some of the key results from the surveys.

Survey Results:

Quantitative Results

94.44% of the students indicated they would recommend SSI to a friend.

100% of the students reported that SSI positively impacted their summer.

100% of students reported an increase (42.86%) or great increase (57.14%) in their understanding of how to engage in scientific research after participating in AU-SSI.

44.44% of students reported an increased interest in attending Auburn University because of SSI, with **94.45%** of students indicating they interested in attending Auburn University.

66.67% reported a greater interest in becoming a scientist after participating in SSI.

After participating in SSI, **55.55%** reported increased interest in biology, **38.89%** reported increased interest in chemistry, **61.11%** reported increased interest in physics, and **55.56%** reported increased interest in mathematics.

After participating in SSI, **88.89%** of students reported an increased awareness and knowledge of careers in biology and chemistry, and **94.44%** reported an increased awareness and knowledge of careers in physics.

100% of the students responded that the iPads contributed positively to their experience in AU-SSI.

One student commented, “They were very helpful in the computational chemistry session, because we were able to connect to the super computer which was really cool.”

The students rated the most enjoyable academic sessions as the biology labs on Wednesday and Friday, with average ratings of 4.11 and 4.12 out of 5 respectively.

All of the nighttime activities received ratings over 4.22 out of 5; the most enjoyable evening program was the Science Demo Show outside of the Chemistry Building and bowling, with a rating of 4.78 out of 5.

Summer Science Institute Class of 2017

Testimonials from 2017

“I think COSAM Outreach did a great job with this program, it was the best summer program I've done.”

“This is a really great program and it should continue to occur as it has been with minor changes.”

“I wish I could come back!”

“The camp was great. Most of my ‘over my head’ answers were due to lack of previous knowledge not provided by my school.”



Program: Project Lead The Way Core Training**Dates:** January 4 - 6, June 5 – July 21**Facilities:** SCA, SCL 102, 105, 231, 302, & 310, SCC 129**Description:**

Project Lead The Way (PLTW) is a non-profit organization that focuses on STEM programs throughout the nation by providing activity-, project-, and problem-based curricula and professional development for STEM educators. By partnering with PLTW, Auburn University was able to facilitate the training of 137 teachers from 12 states across 9 different PLTW courses in 2017. Acting as PLTW's Affiliate University for Engineering, Biomedical Sciences, Gateway, and Launch courses for the state of Alabama, COSAM Outreach and the AU Women in Science and Engineering (WISE) Institute personnel aided in hospitality, lab and classroom resources, staff support, and general facility resources to support instruction.

Courses:

- Gateway Courses
 - Automation and Robotics
 - Medical Detectives
 - Design and Modeling
- Engineering Courses
 - Principles of Engineering
 - Digital Electronics
- Biomedical Sciences Courses
 - Principles of Biomedical Sciences
 - Human Body Systems
- Launch Classroom Teacher Training
- Launch Lead Teacher Training

**Personnel:**

AU: Mary Lou Ewald, Bonnie Wilson, Josh King, Dr. Charles Eick, Jacob Varner, Jessica Gilpin

PLTW, Master Teachers, and Others: Devon Stewart, Lisa Weier, Jill Burgess, Bruce Hermes, Michelle Robinson, Andi Obryan, Bryan Bacher, Andy Northard, Tj Nguyen, Charity Woodard, Chad Shelly, Jenille Woodruff, Joseph Giunta, Rebecca Reed, Alexis Comardo

Impact:

18 Winter Core training teachers and 119 Summer Core training teachers.

Program: Project Lead The Way Supplemental Training

Dates: January 6 – 7, June 10, July 17-21

Facilities: SCL 231, SCC 115

Description:

Project Lead The Way (PLTW) is a non-profit organization that focuses on STEM programs throughout the nation by providing activity-, project-, and problem-based curricula and professional development for STEM educators. By partnering with PLTW, Auburn University was able to facilitate the training of 29 teachers from Alabama across four supplemental training courses in 2017. Acting as PLTW's Affiliate University for Engineering, Biomedical Sciences, Gateway, and Launch courses for the state of Alabama, COSAM Outreach and the Southeastern Center of Robotics Education (SCORE) personnel aided in course instruction, hospitality, lab and classroom resources, staff support, and general facility resources to support instruction.

Courses:

- Design and Modeling Retooling
- RobotC for VEX Robotics
- VEX RobotC Supplemental Training
- VEX RobotC Programming for Gateway and Engineering

Personnel:

AU: Mary Lou Ewald, Josh King, Dr. Charles Eick, Jacob Varner, Jessica Gilpin, Tj Nguyen, Hunter Terry, Frank Ware

PLTW, Master Teachers, and Others: Lisa Weier

Impact:

8 Winter Supplemental training teachers and 21 Summer Supplemental training teachers.

Program: Flipped Learning and Instruction in Physics (FLIP)

Dates: June 20

Facilities: SCC 118

Description:

The FLIP (Flipped Learning and Instruction in Physics) project aims to support teachers in developing the necessary skills, knowledge and beliefs to effectively implement research based inquiry instruction using flipped/inverted approaches in high school physics courses. The 2-year professional development program, funded by a Math Science Partnership grant from the AL State Department of Education, emphasizes content mastery, pedagogical knowledge and the use of professional learning communities (PLC). One unique feature of the program is the extensive use of online technologies – both to facilitate teacher learning (in physics and pedagogy), as well as support the year-round PLC.

In summer 2017, four physics faculty members (Drs. Landers, Kolarkar, and Loch) developed and taught a 1-day training workshop for 8 high school physics teachers from the central Alabama region.

Personnel:

AU Faculty: Drs. Landers, Kolarkar, and Loch.

Other AU Support: Mary Lou Ewald, Christina Steele, and Josh King.

Impact:

8 high school physics teachers from the central Alabama region.



Program: Science in Motion (Teacher Training)

Date: Physics (June 27-30 & July 18-21), Chemistry (June 19-23 & 26-28), Biology (June 5-9 & 13-16), Physical Science (June 29 -30)

Description: A state funded initiative that provides high-tech laboratory experiences for high school students and effective professional development for teachers. The information here is for the summer teacher workshops which trains teachers on pedagogical techniques and how to use the equipment ASIM provides the schools.

Facilities: SCL 306, Parker Hall Lab

Personnel:

AU: Roger Birkhead, Dewayne Riddle, Christina Steele, Pam Pearson

Impact:

Number of Teachers: 51

**Program: AP Summer Institute**

Date: June 19-22, July 10-13, July 17-20

Description: Teacher training that prepares high school teachers to teach an Advanced Placement (AP) course

Facilities: SCA, SCC 115, SCL 231, SCL 102, SCL 105, SCL 306, SCL 310

Impact: 111 high school teachers from Alabama

Program: Destination STEM**Date:** Friday, September 22, 2017, 8:00 am - 2:00 pm**Description:** Science and Mathematics Open House

Destination STEM is an interactive experience and open house where middle and high school students considering careers in Science, Technology, Engineering, and Math are invited to join us for the Interactive Exhibits all throughout the Coliseum Concourse. Faculty and student experts from Biological Sciences, Chemistry, Geosciences, Mathematics and Statistics, and Physics will be on hand with dozens of interactive exhibits. We'll also be joined by SCORE – the Southeastern Center of Robotics Education – watch out for drones flying overhead! Additionally, the College of Engineering will highlight nanoscale science and engineering concepts for participants. Students will be able to browse the displays at their own pace and be enjoy the freedom to see, touch, hear, and smell the many wonders of science!

Personnel:

AU: Mary Lou Ewald, Kristen Bond, Erika Dunavant, Jacob Varner, Hunter Whitten, Marcus Woodard, Grace Denniston, Tj Nguyen, Hunter Terry, Frank Ware, Janie Marino, Emily Hardy, Charles Eick, Teddy Dubose, Josh King, Jessica Gilpin

Non-AU: NA

Schools Impacted:

Admiral Moorer Middle School	Lanett High School
Beverlye Magnet School	Lowndes County Middle School
Central Freshman Academy	Opelika Middle School
Central High School (Phenix City)	Phenix City Intermediate School
Central High School (Lowndes Co)	Smiths Station Junior High School
Coppinville Junior High School	Springwood School
DA Smith Middle School	Talladega County Homeschool
Greensboro High School	Wacoochee Elementary School
Hayneville Middle School	West Smiths Station Elementary School
Knollwood Christian School	

Total Number of Students: approx. 1,700Age Range: 6th – 12th grade**Facilities:** Beard-Eaves Memorial Coliseum

Participation by Department:

Biology, Chemistry/Biochemistry, Geology & Geography, Math & Statistics, Physics, AMSTI, and SCORE were all represented. Over 200 faculty/staff participated during the 4-hour event.

Department Leads Include:

Madison Armstrong, Morgan Beadles, Debbie Folkerts, Rita Graze, Ken Halanych, Emily Hardy, Zahra Karimi, Joni Lakin, Allen Landers, Kristy Mann, Karen McNeal, Tj Nguyen, Andrew Owens, Linda Pastorello, Aaron Rashotte, Kay Stone, Bonnie Wilson, Wei Zhan

Other AU participants included:

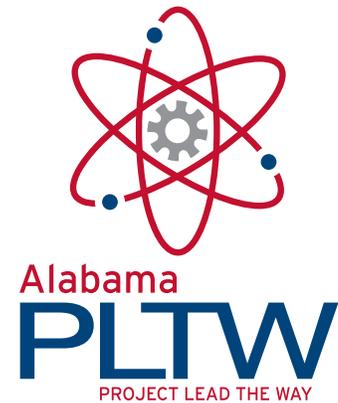
Admissions, Army ROTC, Career Center, COSAM Student Services, Financial Aid, Raptor Center, Scholarship, WISE Institute, and A-Z Animals

Program: Project Lead The Way (PLTW) Biomedical Day

Date: Thursday, November 2, 2017

Facilities: Rouse Life Science Labs, Science Center Laboratory Building, Edward Via College of Osteopathic Medicine, Walker Building, Auburn University Medical Clinic, College of Veterinary Medicine, MRI Research Center, School of Kinesiology

Description: Students taking PLTW high school Biomedical courses (Principles of Biomedical Sciences, Human Body Systems, Medical Interventions, or Biomedical Innovations) from nearby Alabama schools were invited to tour numerous biomedical-related Auburn University departments and facilities. Each school attended sessions based on student survey responses and were led on their tours by volunteers from the Alpha Epsilon Delta service organization and various faculty and staff representatives from each participating department.



Personnel:

Participating Departments: College of Sciences and Mathematics, Edward Via College of Osteopathic Medicine, Harrison School of Pharmacy, Auburn University Medical Clinic, College of Veterinary Medicine, MRI Research Center, School of Kinesiology

COSAM Personnel: Josh King, Charles Eick, Beverly Childress, Krysta Diehl

VCOM Personnel: Morgan Agee

Impact:

Number of Participants: 85 Students from the following schools:

- Eufaula High School
- Buckhorn High School
- Hewitt-Trussville High School
- Oxford High School

Program: Getting Under the Surface (G.U.T.S) - Fall**Date:** Thursday, November 16, 2017; 6:00 pm - 8:30 pm**Description:** Parent/Child teams act as lab partners in a 75-90 minute science activity.**Logistics:**AU Personnel: Josh King, Marcus Woodard, Erika Dunavant, Xoe Fiss, Dr. Melissa Callahan, Curtis Hansen, Morgan BeadlesSchools Impacted: N/ATotal Number of Students: 32Total Number of Parents: 32Age Range: 1st-6th GradeFacilities: SCA, SCL 231 & 310, SCC 115**Course: Color Crazy**

Go mad for color in this GUTS as we explore the link between science and art! Discover why the color wheel doesn't always work for mixing paint (try to mix purple or brown!). Learn how light becomes color. Unravel the mystery of color change in autumn leaves. And finally use all that you've learned to paint your own fall picture!

Age Range: 1st-3rd gradesDeveloped by: Xoe FissNumber of Students: 9Average Parent Satisfaction Ranking: 4.83 (out of 5)Average Student Satisfaction Ranking: 4.83 (out of 5)**Course: Flowers to Fruits, Guts, and Roots**

It's time to get your hands dirty in daisies and plunge into some pumpkins! At this GUTS we'll be digging into the GUTS of Fall fruits and flora and learning the hidden parts and pieces of plants you never knew existed. But to learn the science behind why plants grow this way or that, you might have to get a little messy!

Age Range: 1st-3rd gradesDeveloped by: Morgan BeadlesNumber of Students: 6Average Parent Satisfaction Ranking: 4.83 (out of 5)Average Student Satisfaction Ranking: 4.6 (out of 5)

Course: Baffling Baby Bugs

Why don't we ever see baby ladybugs or bees? Do beetles hide their young, or is there something more mysterious going on? Get up and close to some of the smallest and most intriguing little lives in this GUTS and learn the how's, why's, and what's of metamorphosis in insect life cycles.

Age Range: 4th- Dr. Melissa Callahan

Number of Students: 7

Average Parent Satisfaction Ranking: 4.375 (out of 5)

Average Student Satisfaction Ranking: 4.5 (out of 5)

Course: Chlorophyll and the Coat of Many Colors

Once a year, a hungry little sun-eater becomes the world's greatest artist, and all of us can learn its secrets! At this GUTS session we'll use experimentation and science to learn how nature paints the world around us each Fall, how to identify the different and beautiful leaves it uses, and what forms Autumn's coat of many colors.

Age Range: 4th-6th grades

Developed by: Curtis Hansen

Number of Students: 7

Average Parent Satisfaction Ranking: 4.375 (out of 5)

Average Student Satisfaction Ranking: 4.5 (out of 5)



Program: War Eagle BEST**Dates:**

Thursday, September 14th; 2:30 PM – 7:30 PM (Kick Off Day)

Saturday, October 21st; 10:00 – 2:00 PM (Mall Day)

Friday, October 27th; 12:00 – 5:00 PM (Competition Day)

Saturday, October 8th; 7:00 AM – 5:00 PM (Competition Day)

Description: Middle and high school local robotics program

Personnel:

AU: Mary Lou Ewald, Kristen Bond, Teddy Dubose, Erika Dunavant, Garon Griffiths, Marcus Woodard, Grace Denniston, Josh King, Jessica Taylor, Jacob Varner, Hunter Whitten, TJ Nguyen, Frank Ware, Jessica Gilpin, Bob Ashurst, Dan Schnittka, Mike Fogle and various student volunteers and judges

Non-AU: Barbara Bryan, Pete O’Day, Sid Stubbs, and various judges

Schools Impacted:

Central Educational Center
 Early College Academy/Jordan High School
 Eastwood/Cornerstone School
 Edward Bell Career Technical Center
 Glenwood School
 Holtville Middle School
 LaGrange Academy
 LAMP High School
 Lanett High School
 Lee-Scott Academy
 Opelika High School
 Opelika Middle School
 Saint James School
 Sanford Middle School
 Springwood School
 Stanhope Elmore High School
 Trinity Christian School
 Wetumpka High School



Total Number of Students: approx. 500 **Age Range:** 5th – 12th grade

Facilities: AU Student ACT, AU Student Center, and Auburn Mall

Crossfire Storyline:

Over the years, BEST Inc. has ventured into a wide variety of industries: From underground mining to space exploration - and everything in-between. Throughout its diverse pursuits, BEST has kept safety the number one priority. In line with this, BEST has announced an organization-wide Fire Safety Initiative. Mostly the initiative involves fire *prevention* through new and improved safety policies, but BEST has also started a Research and Development program to explore robot *intervention* in industrial fire emergencies. Your company is invited to submit a robot prototype to be evaluated alongside other prototypes in a state- of-the-art Industrial Fire Simulator.

Robots will not be able to touch the fire directly - in order to extinguish it, they need to launch simulated water from a distance. The highest priority is rescuing the test manikin from inside. Just like in a real rescue, every second counts; robots will receive more points if they complete the rescue in less time.

Game Objectives:

Design and build a prototype robot to rescue a fire test manikin, contain the dangerous chemicals, and extinguish the flames during a three- minute match.



BEST Award Winners

- 1st Place: Eastwood/Cornerstone School*
- 2nd Place: Wetumpka High School*
- 3rd Place: Saint James School
- 4th Place: Holtville Middle/High School

Game Winners

- 1st Place Robotics: Southside Middle School*
- 2nd Place Robotics: Glenwood School*
- 3rd Place Robotics: Eastwood/Cornerstone School*
- 4th Place Robotics (finalist): Tallassee High School

*Advanced to South's BEST Regional Championship

Program: South's BEST Robotics Championship

Date: Friday, December 1st; 3:00 – 7:00 PM (Team Registration and Hub Council Meeting)
 Saturday, December 2nd; 8:00 AM – 6:00 PM (Competition Day)
 Sunday, December 3rd; 8:00 AM – 6:00 PM (Competition Day)

Description: Middle and high school regional robotics championship program for winning teams from 16 BEST hubs across the south

Personnel:

- **AU:** Mary Lou Ewald, Kristen Bond, Jessica Taylor, Garon Griffiths, Teddy Dubose, Josh King, Jessica Gilpin, Erika Dunavant, Marcus Woodard, Grace Denniston, Nia Perkins, Jacob Varner, TJ Nguyen, Hunter Terry, Frank Ware, Bonnie Wilson, Dan Schnittka, and various student volunteers and judges
- **Non-AU:** Pete O'Day (Field Construction), Matt Schuster (Production Manager)

Total Number of Students: approx. 2,000

- **Age Range:** 1st – 12th grade
- **Facilities:** AU Student Center, Wiggins Hall, SCC, SCL, SCA, and the AU Beard-Eaves Memorial Coliseum

Schools Impacted (Hub Affiliation):

School Name	Hub
Glenwood School	War Eagle
Eastwood/Cornerstone Schools	War Eagle
Southside Middle School	War Eagle
Wetumpka High School	War Eagle
Bankhead Middle School	Bevill BEST
Fayette Middle School	Bevill BEST
Episcopal Day School	Central AL
Oak Mountain High School	Central AL
The Donoho School	Central AL
Fellowship Factory	Central AL
Brooks High School	NW AL
Covenant Christian School	NW AL
Moulton Middle School / Lawrence Co. High School	NW AL
Trinitas Classical Academy	NW AL
Lexington High School	NW AL
Rogers High School	NW AL
DARC	TN Valley
Lindsay Lane Christian Academy	TN Valley
W.P. Davidson High School	Jubilee BEST
Faith Academy	Jubilee BEST
MACH Robotics	Jubilee BEST
St. Luke's Episcopal School	Jubilee BEST
Saraland High School	Jubilee BEST
St. Ignatius Catholic School	Jubilee BEST

East Central High School	Jubilee BEST
Good Hope Middle School	North AL
Marshall County Robotics (McROC)	North AL
Spain Park High School	North AL
Wicksburg High School	Wiregrass
Ridgecrest Christian School	Wiregrass
LIGHT Robotics	NE Alabama
John T. Morgan Academy	Selma BEST
Martin Middle School	Selma BEST
Billingsley High School	Selma BEST
Sweet Water High School	Shelton State
Evangel Christian School	Shelton State
Sumter Central High School	Shelton State
Tuscaloosa Christian School	Shelton State
J. U. Blacksher School	River BEST
Thomasville Middle School	River BEST
Thomasville High School	River BEST
Woodlawn Beach Middle School	Emerald Coast
Pensacola Catholic High School	Emerald Coast
Seaside Neighborhood School	Emerald Coast
Brown-Barge Middle School	Emerald Coast
Wheeler High School	Georgia BEST
Fernbank LINKS	Georgia BEST
Piedmont Academy	Georgia BEST
North Forsyth High School	Georgia BEST
South Forsyth High School	Georgia BEST
Starkville High School	Mississippi
North Pontotoc High School	Mississippi
Starkville Christian Home Educators (SCHE)	Mississippi
Corinth School District	Mississippi
McNairy Central High School	Mississippi
DART (Dickson Area Robotics Team)	Music City
Discovery School	Music City
MHMS Robotics Team	Music City
Stewarts Creek Middle School	Music City



Program Sponsors:

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BEST Award Winners

- 1st Place: W.P. Davidson High School (Jubilee BEST)
- 2nd Place: Brooks High School (Northwest Alabama BEST)
- 3rd Place: DARC (Tennessee Valley BEST)

Game Winners

- 1st Place: DARC (Tennessee Valley BEST)
- 2nd Place: Evangel Christian School (Selma BEST)
- 3rd Place: MHMS (Music City BEST)
- Finalist: Oak Mountain High School (Central Alabama BEST)

South's BEST 2017 Steering Team***South's BEST Director & Awards/Judging Coordinator***

Mary Lou Ewald

South's BEST Logistics Coordinator

Kristen Bond

Awards/Judging Assistant

Emily Hardy

Emcees

Jay Knorr, Allen Landers

Field Management

Pete O'Day

Floor Bosses

Beth Patrick, Tj Nguyen

Graphic Design

Grace Denniston

Head Judges

Bob Ashurst, Mike Fogle

Head Referee

Garon Griffiths

Head Field Referees

Vaughn Nichols, Mark Rose, Matt Westberry

Hospitality

Jessica Gilpin

Pit Boss and Technical Director

Dan Schnittka

Photography

Barbara and Bob Bryan

Production Manager

Matt Schuster

Registration & Sales

Teddy Dubose, Sydney Riley

Head Scorekeeper & Webmaster

Jacob Varner

Signage & Staging

Marcus Woodard

Social Media Coordinator

Robin Fenton

Team Advocates

Michael Colletti, Scott Horton, Anneliese Spaeth

Team Coordinator

Josh King

Video Production/Coordination

Greg Ruff

Volunteer Coordinator

Erika Dunavant

WISE/SWSM Luncheon Coordinator

Jessica Gilpin

South's BEST 2017 Represented Hubs

Bevill BEST

Sumiton, Alabama

Bankhead Middle School
Fayette Middle School

Central Alabama BEST

Talladega, Alabama

Episcopal Day School
Fellowship Factory
Oak Mountain High School
The Donoho School

Emerald Coast BEST

Pensacola, Florida

Brown-Barge Middle School
Pensacola Catholic High School
Seaside Neighborhood School
Woodlawn Beach Middle School

Georgia BEST

Atlanta, Georgia

Fernbank LINKS
North Forsyth High School
Piedmont Academy
South Forsyth High School
Wheeler High School

Jubilee BEST

Mobile, Alabama

East Central High School
Faith Academy
MACH Robotics
Saraland High School
St. Ignatius Catholic School
St. Luke's Episcopal School
W.P. Davidson High School

Mississippi BEST

Starkville, Mississippi

Corinth School District
McNairy Central High School
North Pontotoc High School
Starkville Christian Home Educators (SCHE)
Starkville High School

Music City BEST

Nashville, Tennessee

DART (Dickson Area Robotics Team)
Discovery School
MHMS Robotics Team
Stewarts Creek Middle School

North Alabama BEST

Hanceville, Alabama

Good Hope Middle School
Marshall County Robotics (McROC)
Spain Park High School

Northeast Alabama BEST

Rainsville, Alabama

LIGHT Robotics

Northwest Alabama BEST

Muscle Shoals, Alabama

Brooks High School
Covenant Christian School
Lexington High School
Moulton Middle School/Lawrence Co. High School
Rogers High School
Trinitas Classical Academy

River BEST

Thomasville, Alabama

J. U. Blacksher School
Thomasville High School
Thomasville Middle School

Selma BEST

Selma, Alabama

Billingsley High School
John T. Morgan Academy
Martin Middle School

Shelton State BEST

Tuscaloosa, Alabama

Evangel Christian School
Sumter Central High School
Sweet Water High School
Tuscaloosa Christian School

Tennessee Valley BEST

Decatur, Alabama

DARC
Lindsay Lane Christian Academy

War Eagle BEST

Auburn, Alabama

Eastwood/Cornerstone Schools
Glenwood School
Southside Middle School
Wetumpka High School

Wiregrass BEST

Dothan, Alabama

Ridgecrest Christian School
Wicksburg High School

2017 South's BEST Student Survey Executive Summary

Introduction

The 2017 South's BEST Robotics Championship was held December 2-3 at the Beard Eaves Memorial Coliseum on the campus of Auburn University. This year also welcomed the first Regional Invitation Tournament for 16 schools that did not advance to South's BEST but were given an opportunity to earn a slot at the championship.

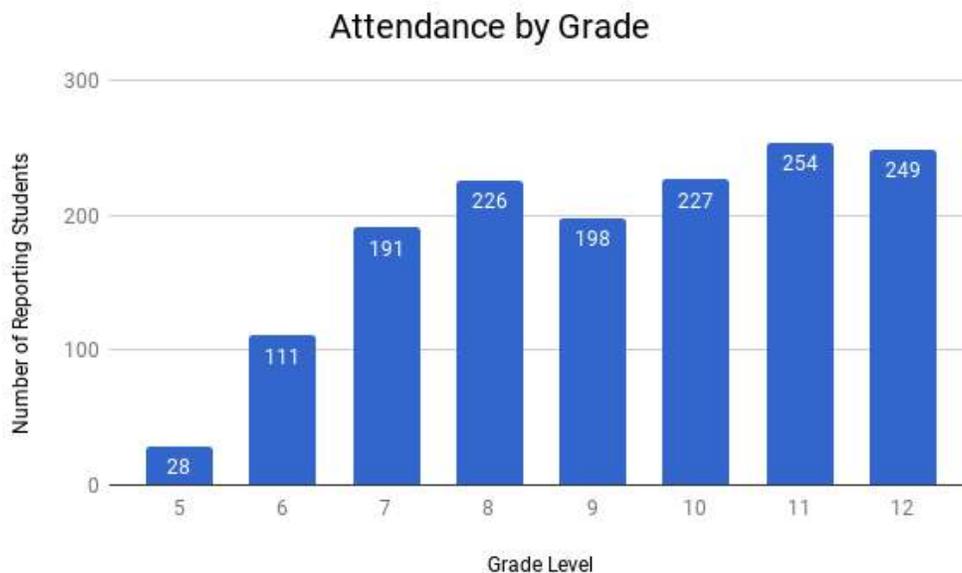
South's BEST hosted 59 teams from five states with 40 of the teams (68%) from Alabama. The other represented states included Georgia, Florida, Mississippi, and Tennessee. The Regional Invitation Tournament included 16 teams from five states, with 11 of the teams (69%) from Alabama. The others represented teams in Georgia, Florida, Mississippi, and Tennessee.

A total of 1,486 students in attendance at the event completed a brief one-page survey. Student surveys were a requirement of team participation in the event, but did not necessarily represent all team members and visitors.

Grade Level

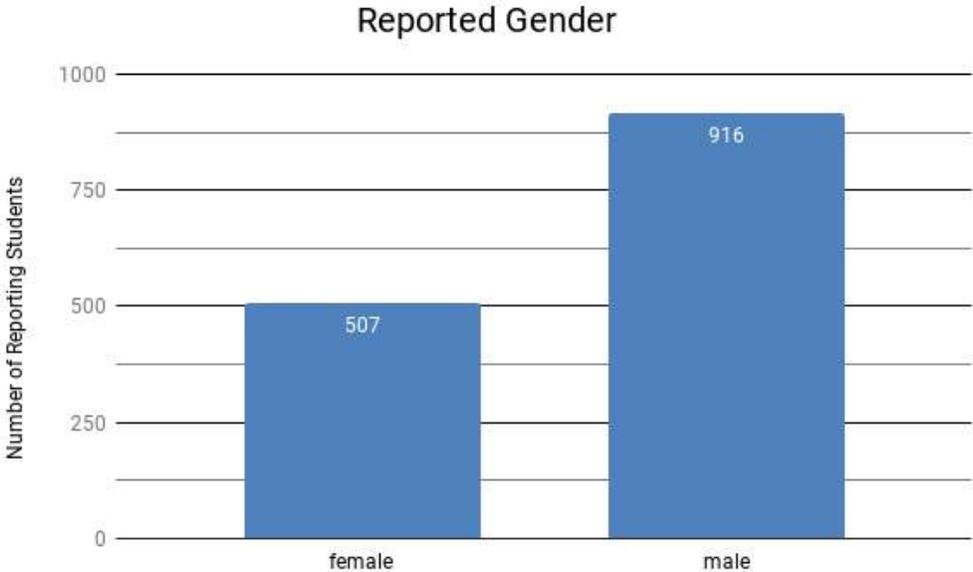
Of the 1,486 students who completed surveys, 1,484 provided their grade level. *Middle school students* (5th-8th grade) accounted for 557 (38%) of reporting students, while *high school students* (9th – 12th grade) accounted for 927 (62%) of reporting students.

The graph below shows the number of reporting students in each grade level 5th through 12th.



Gender

Of the 1,486 completed surveys, 1,423 students provided their gender. 507 (36% of reporting students) were *female* and 916 (64% of reporting students) were *male*, shown in the graph below.

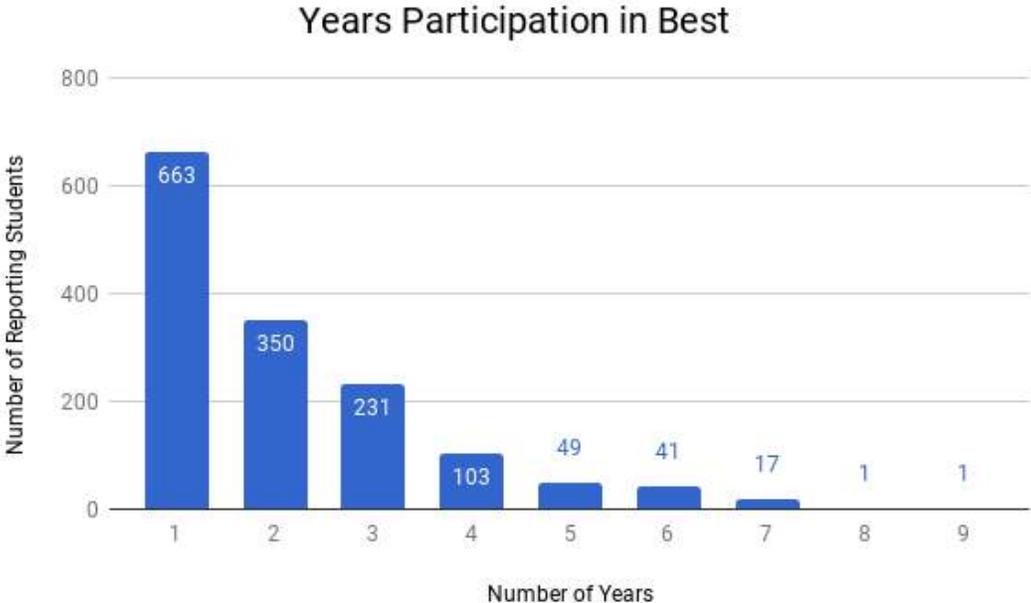


Years in the Program

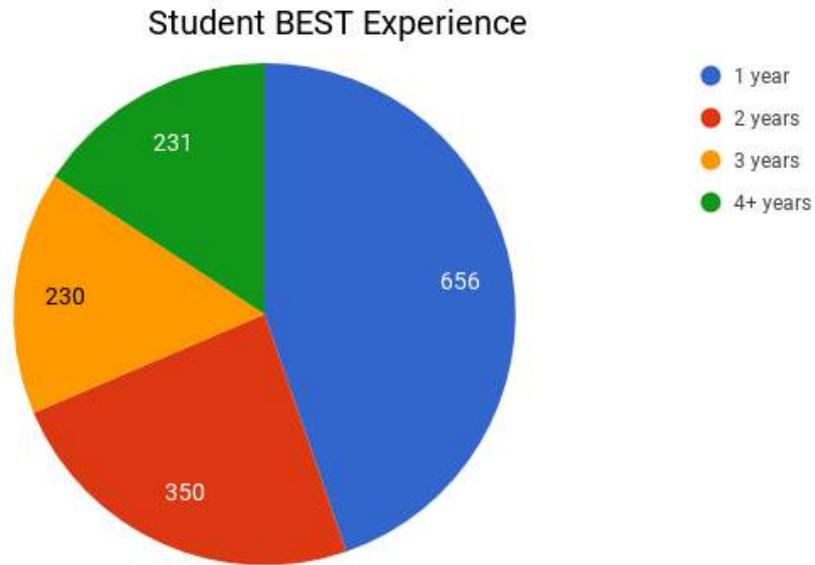
A total of 1,456 students provided the number of years they've participated in BEST.

There were 663 *first-year students*, accounting for 46% of reporting students; 350 *second-year students*, accounting for 24% of reporting students; 231 *third-year students*, accounting for 16% of reporting students; and 212 students who have participated for *four or more years*, accounting for 14% of reporting students. The longest reported participation was 9 years.

The graph below shows the numbers of years that reporting students have participated in BEST.

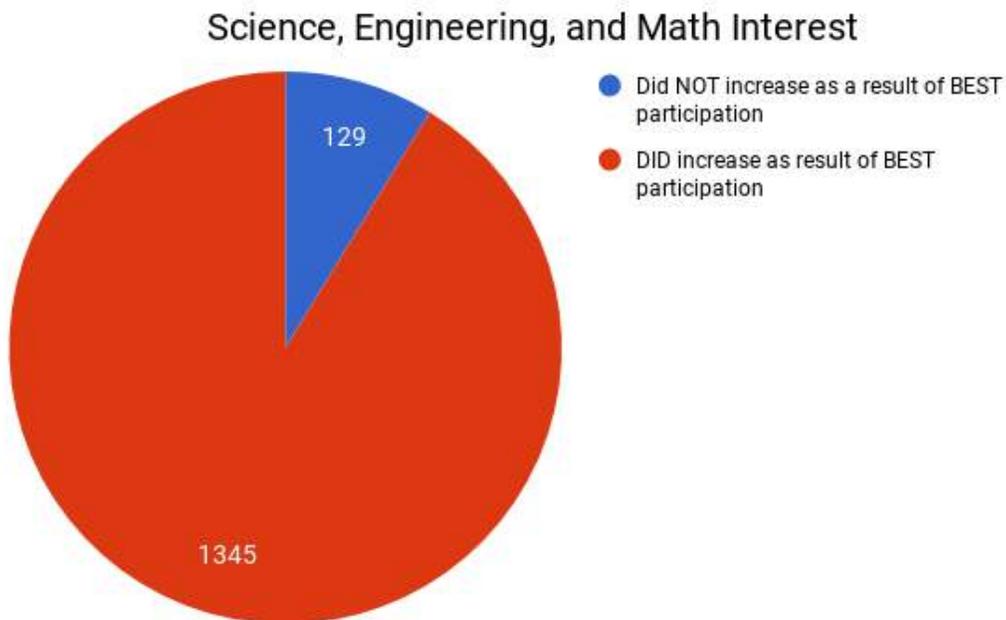


As the BEST program continues to grow yearly, new teams and competition sites are added, attracting new groups of students. These data show the innovation and competitive spirit of first-year teams and participants, as almost half of competitors are new to the program, seen more clearly in the graph below.



Increased Interest in Science, Engineering, and Mathematics

Of the 1,486 completed surveys, 1,474 responded to a question regarding their interest in science, engineering, and mathematics fields *as a direct result* of their participation in BEST. A majority of students reported an increase in interest, shown in the graph below. 1,345 (91.2%) expressed an *increased interest* in math, science, and/or engineering because of their participation in BEST, while 129 (8.8%) expressed *no such increase*.



Plans to Attend College Among All Students

Of the 1,486 completed surveys, 1,482 students responded to a question regarding intent to attend college/university. 42 students (2.8%) reported that they were *not planning to attend college*, while 1,440 (97.2%) reported that they were *planning to attend*.

Of those who did not plan to attend college, six were *female*, 36 were *male*. The majority of these students indicated that they did not plan to attend college due to specific reasons, some of which include *lack of interest*, *lack of money*, *plans to get a job that do not require college/university education*, and/or *plans to enter technical/vocational school*.

As stated before, 1,440 students indicated that they intend to attend a college or university. Of these 1,440 students, 931(64%) were *high school students*. 349 students overall (24% of all responding students intending to attend college/university) were *undecided* on a specific college/university. 178 high school students (12% of responding high school students intending to attend a college/university) were also *undecided* on a specific college/university.

Of the 1440 students who plan to attend a college or university, there were 1094 students who indicated which school(s) they were interested in attending. There was no limit to the number of schools a student could list, and most students who indicated at least one school listed 1-3 preferred colleges or universities. The following were listed as primary schools of interest:

Auburn Univ. – 29%	UAH – 4.5%	Vanderbilt Univ. – 2.2%
Univ. Alabama – 13%	Univ. South Alabama – 4.4%	Florida State Univ. – 1.7%
Mississippi State – 5.5%	Univ. North Alabama – 3.7%	Harvard Univ. – 2.5%
Georgia Tech – 5.9%	Troy Univ. – 2.3%	Univ. of Mississippi – 1.4%
MIT – 3.2%	UAB- 3.5%	Tennessee Tech – 1.1%

The other indicated schools were listed very infrequently, each less than 1% of the total number of colleges indicated.

Field of Study Interest Among All Students

There were thirteen available fields of study and an “other” write-in option for students to choose from. As students were allowed to select one or more fields, the data below represents the frequency of occurrence for the intended fields of study.

Of the 1,049 students who indicated intent to attend college, 52 students (5%) reported that their intended field of study was *Undecided*.

The most commonly indicated field was Engineering/Computer Science, which accounted for 38.3% of student interest. Sciences and Mathematics (including health and medical related fields) accounted for 32.7% of fields indicated by students. 1.9% of students indicated *Other* as their intended field of study with write-in responses that included vocational specialties, theology, sports, game design, political science, and more.

The overall response breakdown (aside from *Undecided*) can be seen in the following table.

Field of Study	Percentage of All Students That Chose Each Field
Agriculture	2.6%
Architecture/Design/Construction	9.0%
Business (marketing, accounting, aviation, etc.)	4.6%
Communications/Journalism	1.4%
Criminology/Law	5.1%
Education	2.7%
Engineering/Computer Science	38.4%
Fine Arts (art, music, film, theatre)	5.5%
History/Literature/English	1.1%
Mathematics	4.8%
Medicine/Health/Veterinary/Nursing	14.6%
Psychology/Social Work	1.7%
Science (chemistry, biology, physics)	6.6%
Other	1.9%

Field of Study Interest Among High School Students

As stated previously, 42 students said they had no plans of attending college, 37 of which reported being in high school. 891 high school students responded with intentions to attend college/university.

24 (2.7%) of high school students intending to attend college/university reported that their intended field of study was *Undecided*. **The most commonly indicated field was Engineering/Computer Science, which accounted for 44.1% of student interest. Sciences and Mathematics (including health and medical related fields) accounted for 20.4% of fields indicated by students.** 1.8% of high school students reporting intentions to attend college/university reported their intended field of study as *Other*.

The following chart represents the overall response breakdown of high school students interested in attending college/university (aside from *Undecided*):

Field of Study	Percentage of High School Students That Chose Each Field
Agriculture	2.4%
Architecture/Design/Construction	7.7%
Business (marketing, accounting, aviation, etc.)	5.3%
Communications/Journalism	1.6%
Criminology/Law	3.9%
Education	2.9%
Engineering/Computer Science	44.1%
Fine Arts (art, music, film, theatre)	4.2%
History/Literature/English	0.9%
Mathematics	2.7%
Medicine/Health/Veterinary/Nursing	14.2%
Psychology/Social Work	2.1%
Science (chemistry, biology, physics)	6.2%
Other	1.8%



Student Survey 2017

Name: _____ City/State: _____

School: _____ Grade: _____ Gender: Female Male

1.) Do you intend/want to go to college?

Yes

No

If so, where would you like to attend? _____

What field of study do you plan to major in?

Agriculture

Architecture/ Design/ Construction

Business (marketing, accounting, aviation, etc)

Communications/ Journalism

Criminology / Law

Education

Engineering/ Computer Science

Fine Arts (art, music, film, theatre)

History/ Literature/ English

Mathematics

Medicine/ Health/ Veterinary/ Nursing

Psychology/ Social Work

Science (chemistry, biology, physics)

Other: _____

2.) If you are NOT planning to attend college, why not?

I have no interest in attending college

I can't afford to attend college

I plan to get a job

Other: _____

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

Yes

No

4.) How many years (including this year) have you participated in BEST?

1 year

3 years

2 years

More than 3 years: _____

5.) Are you a member of your school's BEST team or are you attending as a visitor supporting your school's BEST team?

Team Member

Visitor





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