

ANNUAL REPORT

2014

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.



20

on-site programs



72

contact days



7,829

students, parents, and teacher participants

About COSAM Outreach

To promote careers in sciences and mathematics among K-12 students, the College of Sciences and Mathematics (COSAM) at Auburn University has designed an innovative outreach division offering special events, competitions, workshops, and programs throughout the year for the general public and K-12 students and teachers. These activities are designed to provide a continuum of programs for students in various stages of their educational development.

In 2014, COSAM Outreach hosted over 10,000 students, parents, and teachers at events on the AU campus. A total of 20 on-site programs, with 72 contact days, were hosted/sponsored by COSAM's Outreach Office. Additionally, over 70,000 students and teachers were impacted through Alabama Science in Motion and the Alabama Math, Science, and Technology Initiative (AMSTI). In fact, an additional 40 teacher training days were devoted to AMSTI and Alabama Science in Motion Teacher Professional Development.

In Outreach, we continuously evaluate and assess our existing programs while also creating new programs for specific target audiences. In 2014, we piloted three new science and math outreach initiatives, including:

Robotics University

Robotics University is Phase 2 of a three-year grant-based initiative designed to stimulate project-based STEM education

through training and resources to middle school science and math teachers statewide. See the "Outreach Highlights" section of this report for more information.

Project Lead The Way (PLTW)

PLTW is a national K-12 STEM education program that provides professional development for teachers and school administrators through core training and conferences. COSAM Outreach is now the state PLTW affiliate site for the Biomedical Sciences curriculum.

STEM-IQ

The objective of STEM-IQ, a 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 COSAM Outreach. We are using existing science fair infrastructure as a framework to provide teacher professional development and enhance the STEM pipeline for students from Southeastern Alabama.

As our program offerings continue to grow, I am pleased to report that an increasing number of COSAM faculty are enthusiastically connecting with the public through our programs and sharing their passion for science and mathematics. Their involvement adds breadth and depth to our program offerings and provides more opportunity for the public to be true shareholders in the resource that IS Auburn University. We invite you to take a moment to review our 2014 annual report for more information on this past year's successes.

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Outreach Highlights

professional development and resources they need to engage their students in meaningful hands-on, project-based learning in science and math classrooms. The program featured in this year's annual report is an initiative called RE2-FoCUS (Robotics and Engineering Education Fostering the Conceptual Understanding of Science) which is designed to stimulate project-based STEM education throughout Alabama by facilitating teacher professional development in engineering and robotics education. The program received a three-year, \$633,000 Math and Science Partnership award from the U.S. Department of Education through the Alabama State Department of Education. The program introduces modules through teacher professional development workshops that incorporate the use of active engagement tools such as robotics in the classroom to teach science and inspire students about STEM-related careers.

In 2013, the RE2-FoCUS team of scientists and science educators from COSAM and the College of Education trained over 150 middle school science and math teachers and 16 AMSTI specialists on a unique hands-on curriculum that challenges students to 'save an animal' by implementing science, technology, engineering and mathematics concepts. The Save the Animals modules were designed to encourage youth to recognize how their behaviors at home affect animals the world over. They explore science concepts, environmental issues affecting animals, and engage in engineering solutions to remediate the problems, thus saving the

Teachers are the backbone of a solid and effective K-12 educational system. As new technologies surface, teachers are often expected to incorporate those technologies into classroom learning with little-to-no professional development and few-if-any additional resources. If we aspire to have the best students at Auburn University, we must find ways to nurture the system from which they come.

Over the past year, COSAM Outreach has embarked on several new grant-based collaborations that focus on helping teachers by providing the

animals. Researchers on the team assessed teachers' content knowledge on topics including heat transfer, force, motion, and energy before and after the training. The results showed a statistically significant increase in teachers' content knowledge of these topics after participating in the 3-day workshop. The Save the Animals kits used in training are now being circulated statewide through the AMSTI program and have impacted over 10,000 students statewide in the past two years.

In 2014, the team of scientists invited 40 teachers from the original 150 teachers to participate in a four-day intensive training on math and science content related to robotics education. During "Robotics University", teachers learned robotics design, construction, operation, and computer programming skills, integrated with science and math content applications related to optimizing robotic function such as simple machines, motion, force, power, and basic algebra and trigonometry. Additional Robotics University trainings will occur in 2015 in Florence, AL and at Auburn University. To date, our research findings from this study have been presented at 3 national conferences and one regional conference. More importantly, we are finding that these workshops are increasing teachers' confidence to implement more hands-on learning opportunities for the students in their science and math classes.

Initiatives such as RE2-FoCUS demonstrate how Auburn University faculty can positively impact the youth of our state. Learn more about RE2-FoCUS and our many other programs by visiting the COSAM Outreach website: www.auburn.edu/cosam/outreach.



Mary Lou Ewald,

Mary Lou Ewald

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, Co-PI, 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.



Erin Percival
Assistant Director of Outreach

Erin's primary office responsibilities include management of Outreach programs, supervision of student employees, and curriculum development oversight. This year she directly managed GUTS, High School AMP'd Challenge, GEARSEF and the AU Explore Science EXPO. Additionally, she served as the lead coordinator on the STEM-IQ Teacher Professional Development Team. In this role, she developed curriculum for a week-long teacher training.



Kristen Bond
Outreach Administrator

Kristen's responsibilities during the 2014 year included: coordination of elementary and middle school Science Olympiads, Science Matters Summer Academy, Middle School AMP'd, as well as school coordination and logistics at both the War Eagle BEST and South's BEST competitions.



Amy Mathis
Office Manager- TES Employee

Amy's primary responsibilities included: Science Matters Summer Academy coordination and Office Management. In this role, she registered all students for the Science Matters program, managed volunteer hospitality, and managed the office through the purchasing of supplies, updating the Facebook page, and maintaining program records.

Student Employees



Tj Nguyen

Student Program Coordinator - Graduate Student

Mechanical Engineering & Secondary Science Education
Graduate Student, Sixth year in COSAM Outreach

Primary Responsibilities:

Technical Assistant and Floor Boss of BEST Robotics
Curriculum Developer and Instructor for Robotics Academy
Curriculum Developer, Instructor, and Data Entry for Robotics University (MSP Grant)



Allison Tjelmeland

Student Program Coordinator - Graduate Student

Biological Sciences & Secondary Science Education
Graduate Student
Third year in COSAM Outreach

Primary Responsibilities:

GEARSEF Coordinator
Curriculum Developer and Instructor for STEM-IQ Teacher Professional Development Training



Katie Teixeira

Student Program Assistant

Biomedical Sciences
Graduated in May 2014
First year in COSAM Outreach



Amber Derouen

Student Program Assistant

Cell and Molecular Biology
Senior
First year in COSAM Outreach

Student Employees



Khori Dunn
Student Program Assistant
Biomedical Sciences & Art
Sophomore
Second year in COSAM Outreach



Jacob Varner
Student Program Assistant
Software Engineering
Sophomore
Second year in COSAM Outreach



Hunter Whitten
Student Program Assistant
Building Science
Sophomore
Second year in COSAM Outreach

2014 Outreach Calendar

January 25	High School Auburn Mathematical Puzzle Challenge
February 1	The Alabama STEM Studio for Afterschool Learning (TASSAL)
February 15	Elementary Science Olympiad
February 18	Getting Under The Surface (GUTS)
March 1	Middle School Science Olympiad
March 20	Greater East Alabama Regional Science and Engineering Fair (GEARSEF)
April 18	Getting Under The Surface (GUTS)
April 25	AU Explore
May 8	Society of Women in Sciences and Mathematics Annual Symposium
May 27 - 30	Science Matters
June 2 – 6	Science Matters
June 8 – 14	Summer Science Institute (SSI)
June 16 – 20	Science Matters
June 23 – 27	Science Matters
June 24 – 27	Robotics Academy
July 8 – 11	Robotics University
July 14 – 18	Science Matters
July 15 – 18	AP Summer Institute for Teachers
July 22 – 25	Robotics University
July 28 – Aug. 1	Science Matters
August 27	War Eagle BEST – Kick Off
September 13	Middle School AMP'd Challenge
September 28	War Eagle BEST – Mall Day
October 9	Project Lead The Way State Conference
October 10 – 11	War Eagle BEST – Competition Days
October 16	STEM-IQ Teacher Orientation
December 6 – 7	South's BEST
December 9	SWSM Holiday Reception

Program Descriptions



Auburn Mathematical Puzzle Challenge

Funding Source: COSAM, participant fees

The Auburn Mathematical Puzzle Challenge, or AMP'd Challenge for short, is a problem solving challenge offered two times each year. In the fall, AU hosts a middle school event in which teams of 6 –8 students work together to ‘solve a crime’ by solving thematic mathematical puzzles. In the spring, a high school event is hosted in which students are challenged to solve 10 - 12 puzzles in a five hour period.



AU Explore

Funding Source: COSAM

AU Explore is COSAM's annual Open House Day for 5th - 8th 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.



Greater East Alabama Regional Science & Eng. Fair

Funding Source: COSAM, Samuel Ginn College of Engineering, and 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 21 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.



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.

Program Descriptions



Robotics Academy

Funding Source: Participant fees

Robotics Academy is a summer day camp for middle school students interested in robotics. Working in teams, students engage in real-world design scenarios that culminates in a friendly competition on the last day of the academy. Students are introduced to the design process, the importance of notebooks and technical writing, as well as gain hands-on experience programming and building robots using VEX robotics kits. All aspects of the camp are applicable outside of the Robot Academy. The programming portion teaches logic that is applicable to any other programming language, and the VEX robotics control system is used in other robotics competitions such as BEST Robotics.



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 23 different competitive events. Each spring, Auburn University hosts two separate Science Olympiad competitions- one in February for 500+ elementary students and one for 200+ middle school students in March. Winners from the middle school competition advance to the state competition each April.



Summer Science Institute

Funding Source: NSF, SWSM, the Physics Department, and 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



Society of Women in Sciences and Mathematics Symposium

Funding Source: Sponsorships and Participant Fees

The annual Women's Leadership 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.



Society of Women in Sciences and Mathematics - Holiday Reception

The SWSM Holiday Reception is an annual event which allows for fellowship among women working in scientific and mathematics-based fields. The event occurs each December and includes women working in both academic and industrial settings.



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.

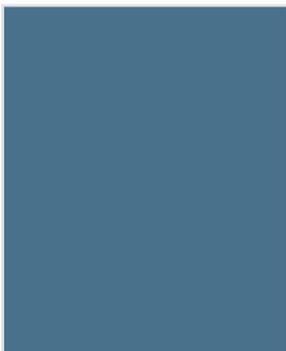


South's BEST

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 the Auburn Arena for the Annual South's BEST Regional Robotics Championship. Winners from 17 Southeastern BEST hubs advance to South's BEST, where the "Best of the BEST" compete in two intense days of competition.

Program Descriptions - Teacher Professional Development



AP Summer Institute

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, Calculus, and Statistics.



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 (PTE), Biomedical Sciences (BMS), and Gateway to Technology (GTT) 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.



Robotics University Workshop

Funding Source: Alabama State Department of Education (MSP Grant)

Robotics University is a four-day, robotics education training workshop for middle school teachers in the state of Alabama. Teachers use VEX rapid-prototyping kits to build their own operational robot and deepen mathematics and physical science content knowledge. The workshop is the second component in a three-year grant to support the RE²-FoCUS Initiative (Robotics and Engineering Education Fostering the Conceptual Understanding of Science) to offer professional development for Alabama middle school science and math teachers. The RE²-FoCUS Initiative is a collaboration between the College of Sciences and Mathematics, the College of Education, and Alabama Math, Science and Technology Initiative (AMSTI).



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 design process. The program is funded through a National Science Foundation, EPSCoR 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.

Program Descriptions - Teacher Professional Development



The 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, in partnership with the College of Education's Department of Curriculum and Teaching and the Truman Pierce Institute. 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.

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

Description: Math Puzzle Challenge event for high school students

Date: Saturday, January 25

Facilities: Sciences Center Auditorium, Sciences Center Laboratory Building, Parke Hall

Personnel:

AU: Erin Percival, Mary Lou Ewald, Kristen Bond, Allison Tjelmeland, Amber Derouen, Khori Dunn, and Jacob Varner

Non-AU: Eric Harshbarger

Student Impact:

Number of Students: 160

Grade Range: 9th - 12th

Schools Served:

- Auburn High School
- Beauregard High School
- Beulah High School
- Central Educational Center
- East Coweta High School
- Hoover High School
- Lanett High School
- Opelika High School
- Montgomery Catholic Preparatory School
- Northgate High School
- Saint James School
- Vestavia Hills High School
- W.P. Davidson High School



Program: The Alabama STEM Studio for Afterschool Learning (TASSAL)

Description: COSAM Outreach, in partnership with the College of Education's Department of Curriculum and Teaching and the Truman Pierce Institute, received funding to design a new statewide afterschool STEM training program. TASSAL 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. Teachers can choose to participate in training workshops for one or both of the following kit-based curricular programs:

- Save the Animals Engineering Teaching Kits – (Grades 5-9)
- AfterSchool KidzScience™ – (Grades 3-6)

The February 1 training introduced 27 afterschool educators from 13 CCLC sites to a new kit in the Save the Animals Engineering Teaching Kit series, "Save the Snails, Salamanders and other Slimy Creatures", developed by Dr. Christine Schnittka in the AU College of Education. In "Save the Snails", participants learn how electricity is generated and then design and build their own gravity light. Each CCLC site took home a free Save the Snails kit (\$650 value) following the workshop. Dr. Schnittka will follow up with participants to assess their use of the curriculum with their students.

Date: Saturday, February 1

Facilities: Sciences Center Classrooms Building

Personnel:

AU: Mary Lou Ewald, Christine Schnittka Chris Groccia, Jessica Cooper, Amber Derouen

Impact:

Number of Participants: 27

CCLC Sites Impacted: Boys and Girls Club of North Alabama (Huntsville), Centre Elementary School, Centre Middle School, Eclectic Middle School, Fleeta Jr. High School (Opp), Girls Inc. of Huntsville, Livingston, Millbrook Middle School, North Sumter (Panola), Piedmont Mpower Program, Talladega Counts, W.O. Lance Elementary/STARS (Lanett), W.S. Harlan Elementary School (Lockhart)



Program: Elementary School Science Olympiad (Division A2)

Description: Regional Elementary School Olympiad

Date: Saturday, February 15th; 7:30 AM - 4:00 PM

Facilities: AU Student Center, Parker Hall, Science Center Labs, Science Center Auditorium, Science Center Classrooms

Personnel:

AU: Kristen Bond, Mary Lou Ewald, Erin Percival, Amy Mathis, Jo-Marie Kasinak, TJ Nguyen, Allison Tjelmeland, Hunter Whitten, Katie Teixeira, Jacob Varner, Amber Derouen, Khorizon Dunn.

Non-AU: Science teachers from participating schools

Student Impact:

Number of Students: 500

Grade Range: 3rd - 6th

Schools Served:

- Excalibur Christian
- Geneva Middle
- Highlands Elementary
- W.O. Lance Elementary
- Mt. Gap Elementary
- W.S. Neal Middle
- Ogletree Elementary
- Pick Elementary
- Prattville Christian
- St. Luke's Episcopal
- Thompson Intermediate
- Wrights Mill Rd. Elementary
- Yarbrough Elementary



Program: Getting Under the Surface (GUTS)

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

Date: Tuesday, February 19th; 6:00 PM - 8:00 PM

Facilities: SCC 115

Personnel:

AU: Erin Percival, Kristen Bond, Katie Teixeira, and Hunter Whitten

Non-AU: Andrew Click (Sanford Middle School)

Student Impact:

Number of Students: 15

Grade Range: 1st -3rd

Schools Served: NA

Course: Rollercoaster Rally

Have you ever wondered what it would be like to design a rollercoaster? What causes them to be able to move the way that they do? What keeps you safe inside of a rollercoaster? We will use our scientific and investigation skills to delve deep into the rollercoaster building process in this course and find out facts about rollercoasters!



Program: Middle School Science Olympiad (Division B)

Description: Regional Middle School Science Olympiad

Date: Saturday, March 1st; 7:30 AM - 4:00 PM

Facilities: AU Student Center, Parker Hall, Science Center Labs, Science Center Auditorium, Science Center Classrooms, Haley Center, Petrie Hall

Personnel:

AU: Kristen Bond, Mary Lou Ewald, Erin Percival, Jo-Marie Kasinak, Amber Derouen, Katie Teixeira, Jacob Varner, Hunter Whitten, Tj Nguyen, Allison Tjelmeland

Student Impact:

Number of Students: 200

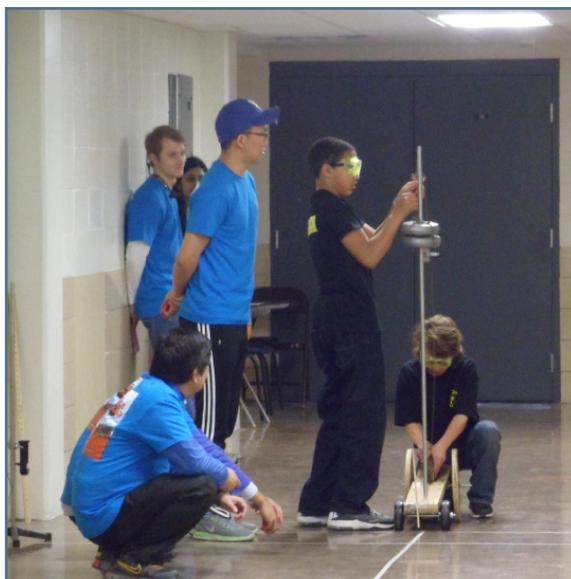
Grade Range: 6th - 9th

Schools Served:

- Auburn Classical Academy
- Auburn Junior High School
- Baldwin Arts and Academics Magnet School
- Bottenfield Middle School
- J.F. Drake Middle School
- Hayden Middle School
- Marion Academy
- Montgomery Catholic Preparatory School
- Saint James Middle School

Event Supervisors:

Supervisor:	Event Title:
Sam Hirt	Anatomy
Dr. Dmitry Glotov	Booilever
Dr. Sharon Hamilton	Crime Buster
Dr. Chris Goldsmith	Can't Judge a Powder
Dr. Mark Liles	Disease Detectives
Jennifer Parker	Disease Detectives
Dr. Molli Newman	Disease Detectives
Dr. Ashraf Uddin	Dynamic Planet
Daniel Smith	Experimental Design
Dr. Jessica McDonald	Helicopter
Dr. Chris Sunderman	Heredity
Dr. Phil Chaney	Meteorology
Dr. Jennifer Stone	Metric Mastery
Dr. Luke Marzen	Road Scholar
Dr. Huajun Huang	Roto Egg Drop
Dr. Ziqin Fent	Robo-Cross
Dr. Bill Hames	Rocks and Minerals
Dr. Sarit Dhar	Shock Value
Dr. David Maurer	Simple Machines
Dr. Minseo Park	Sounds of Music
Matt McVay	Water Quality
Jessica Gilpin	Water Quality
Dr. David Ennis	Wheeled Vehicles
Dr. Bob Lishak	Write It/Do It



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

Description: An Intel ISEF regional science and engineering fair in which students present science fair projects to a panel of university faculty.

Date: Thursday, March 20, 2014; 8:00 am - 3:30 pm

Facilities: Student Center Ballroom, SC 2216, SC 2218, SC 2222, SC 2223, SC 2225

Personnel:

AU: Erin Percival, Mary Lou Ewald, Kristen Bond, George Blanks, Amy Mathis, Allison Tjelmeland, Jacob Varner, Tj Nguyen, Jo-Marie Kasinak, Hunter Whitten, Katie Teixeira, Amber Derouen, and Khori Dunn

Non-AU: NA

Student Impact:

Number of Students: 79

Grade Range: 6th - 12th

Schools Represented:

- Auburn Junior High School
- Auburn High School
- Calhoun School
- Central High School
- D.A. Smith Middle School
- Eclectic Middle School
- Geneva Middle School
- Glenwood School
- J.F. Drake Middle School
- Opelika Middle School
- Redland Elementary School
- Stanhope Elmore High School
- Wetumpka Middle School
- Wetumpka High School

AU Faculty and Grad. Student Judging Panel:

COSAM

Shaliah Armstrong
 Roger Birkhead
 Paul Cobine
 Roland Dute
 Bianca Evans
 Symon Gathiaka
 Sharon Hamilton
 Malorie Hayes
 Wendy Hood
 Shawn Jacobsen
 Stephen Kempf
 Allen Landers
 Richard Mariita
 Chandana Mitra
 Jonathan Musila
 Stephanie Renuart
 Dewayne Riddle
 Elizabeth Schwartz
 Aubrey Sirman
 Catherine Situma
 Christina Steele
 Christine Sundermann
 Kathryn West

Engineering

Ali Abdel-Hadi
 Virginia Davis
 Cheryl Seals
 Aaron Seeto

Other

Lt. Jonathan Culbert
 Lt. Col. Jeffrey Hemmes
 Colonel Matt Mathis
 Diane Taylor
 George Turner



Program: Getting Under the Surface (GUTS)

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

Date: Thursday, April 10th; 6:00 PM - 8:00 PM

Facilities: Scc 115, SCL 231, SCL 310

Personnel:

AU: Erin Percival, Kristen Bond, Hunter Whitten, and Katie Teixeira

Non-AU: Aleesa Zutter (Yarbrough Elem.) & Bruce Zutter (Ogletree Elem.)

Student Impact:

Number of Students: 16

Grade Range: 1st -6th

Course: Boy Oh Boy Oh Buoyancy

Why do some objects sink in water and others float? What is a Cartesian diver? In this all-new course we will explore floating and sinking in several hands-on activities.

Grades: 1 - 3

Developed by: Bruce Zutter

Number of Students: 4



Course: Anatomy in Action

When you dive into a pool or ski down a mountain your body is working in overtime to make it look and feel flawless. Your muscles and bones are especially important in allowing movement. Come along with us as we explore how our muscles and bones help us roll, jump, dance, and play!

Grade Range: 4 - 6

Developed by: Aleesa Zutter

Number of Students: 8

Program: AU Explore

Description: COSAM's annual science and mathematics invitational

Date: Thursday, April 25th; 8:00 AM - 3:00 PM

Facilities: Parker Hall, SCL, SCC, SCA, Chemistry Building, Rouse Life Sciences, Parker Lawn, Amphitheater, and Biodiversity Learning Center

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kristen Bond, Amy Mathis, Allison Tjelmeland, Tj Nguyen, Katie Teixeira, Amber Derouen, Jacob Varner, Hunter Whitten, Khori Dunn, Jo-Marie Kasinak, additional AU personnel listed below.

Student Impact:

Number of Students: 600

Grade Range: 5th - 8th

Schools Served:

- Alexander City Middle School
- Chambers Academy
- Greensboro Middle School
- Knollwood Christian School
- Ladonia Elementary
- Meadowlane Elementary School
- Northside Intermediate School
- Phenix City Intermediate School
- Ridgecrest Elementary School
- Victory Baptist School

Science EXPO: The EXPO is a series of interactive displays. Students browse the displays at their own pace and are able to see, touch, hear, and smell the many wonders of science and math! Included in the Science EXPO are live animal displays, featuring snakes, lizards, turtles, spiders, insects, and many more fascinating creatures!

- Nanette Chadwick and graduate students
- Debbie Folkerts and graduate students
- Ken Halaynch and graduate students
- Shawn Jacobsen
- Allen Landers and graduate students
- Minseo Park
- Aaron Rashotte and graduate students



Science Fun Shop: The Science Fun Shops are short, hands-on mini-courses focused on a particular topic. The courses typically last 45 minutes.

- **All About Eyeballs**
Instructed by: Bob Lishak
Number of students impacted: 25
- **Build a Monster Bug**
Instructed by: Kristy Mann
Number of students impacted: 55
- **Build a Motor**
Instructed by: Erica Snipes, Nicole Engleman, Spencer LeBlanc
Number of students impacted: 88
- **Carnivorous Plants**
Instructed by: Dee Smith
Number of students impacted: 30
- **Cartesian Diver**
Instructed by: Dave Patrick
Number of Students impacted: 40
- **Clinical Lab Sciences Open House**
Instructed by: Kat Milly West
Number of students impacted: 106
- **Fly Over Alabama**
Instructed by: Chandana Mitra,
Number of students impacted: 24
- **Fur, Feathers, and Fins**
Instructed by: Matt Kearly
Number of students impacted: 60
- **Genes in a Bottle**
Instructed by: Mark Liles
Number of students impacted: 24
- **Hoo Eats Who?**
Instructed by: - Chris Sundermann, Roland Dute
Number of students impacted: 49
- **Seeing is Believing?**
Instructed by: Linda Pastorello
Number of students impacted: 46
- **Silly Cilia**
Instructed by: Tony Moss
Number of students impacted: 48

Demo Shows: Large-scale science shows.

- **Herpetology Show - 9:00, 1:00**
Number of students impacted: 216
Michael Wines
- **Pyro Show - 1:00**
Number of students impacted: 70
John Gorden and Anne Gorden
- **Loud & Crazy Show - 12:00**
Number of students impacted: 140
Dewayne Riddle, Christina Steele, Pam Pearson
- **Glow Show- 12:00**
Number of students impacted: 50
Wei Zhan and Steve Mansoorabadi

Math EXPO: The Math EXPO is a tent chock full of interactive math learning activities.

Number of students impacted: 150
Developed by: John Asplund, Andy Owens, and Kat Perry

AUNHM EXPO: The Biodiversity Learning Center in the Auburn University Natural History Museum hosts a Science EXPO. Through their collections, the Auburn University Museum of Natural History provides access to specimens that are integral to studying and understanding Earth's biodiversity.

Number of students impacted: 318
Hosted by: Jason Bond, Jon Armbruster, Les Goertzen, Rebecca Godwin, Curtis Hansen, Brian Helms, David Laurencio, Dave Werneke



Participation by Department

Biology:

- Jon Armbruster (AUNHM EXPO)
- Jason Bond (AUNHM EXPO)
- Nanette Chadwick (Science EXPO)
- Roland Dute (Science Fun Shop)
- Debbie Folkerts (Science EXPO)
- Les Goertzen (AUNHM EXPO)
- Rebecca Godwin (AUNHM EXPO)
- Ken Halanych (Science EXPO)
- Curtis Hansen (AUNHM EXPO)
- Brian Helms (AUNHM EXPO)
- Shawn Jacobsen (Science EXPO)
- Matt Kearly (Science Fun Shop)
- David Laurencio (AUNHM EXPO)
- Mark Liles (Science Fun Shop)
- Bob Lishak (Science Fun Shop)
- Tony Moss (Science Fun Shop)
- Molli Newman (Science Fun Shop)
- Linda Pastorello (Science Fun Shop)
- Aaron Rashotte (Science EXPO)
- Dee Smith (Science Fun Shop)
- Chris Sundermann (Science Fun Shop)
- Dave Werneke (AUNHM EXPO)
- Mike Wines (Demo Show)

Chemistry/Biochemistry:

- Anne Gorden (Demo Show)
- John Gorden (Demo Show)
- Steve Mansoorabadi (Demo Show)
- Kat Milly West (Science Fun Shop)
- Wei Zhan (Demo Show)

Geology and Geography:

- Chandana Mitra (Science Fun Shop)

Mathematics and Statistics:

- John Asplund (Math EXPO)
- Andy Owens (Math EXPO)
- Kat Perry (Math EXPO)

Physics:

- Nicole Engleman (Science Fun Shop)
- Allen Landers (Science EXPO)
- Spencer LeBlanc (Science Fun Shop)
- Minseo Park (Science EXPO)
- Dave Patrick (Science EXPO)
- Erica Snipes (Science Fun Shop)

AMSTI/Science in Motion:

- Kristy Mann (Science Fun Shop)
- Dewayne Riddle (Demo Show)
- Pam Pearson (Demo Show)
- Christina Steele (Demo Show)



Program: Society of Women in Sciences and Mathematics Women's Leadership Symposium

Description: High School girls, SWSM members, AU faculty, and students attend an annual symposium consisting of a panel discussion, break-out session, career corner and luncheon with keynote speaker.

Date: Thursday, May 8, 2014, 8:00 AM – 1:30 PM

Facilities: Student Center

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kristen Bond, Jo-Marie Kasinak, Amy Mathis, Linda Newton, Allison Tjelmeland, Jacob Varner, Amber Derouen, Katie Texiera, Sherri Rowton, Brook Moates, Kim McCurdy

Non-AU: Dr. Sandra Rattray

Student Impact:

Number of Students: 77

Grade Range: 9th - 12th

Schools Served:

- Auburn City Schools
- Beulah High School
- Lanett High School
- Loachapoka High School
- Montgomery Catholic Prep. School
- Tallassee High School

Marie W. Wooten Distinguished Speaker:

- **Sandra Rattray**
Vice President and Head
Global Regulatory Affairs-Oncology
Johnson and Johnson

Panelists and their Break-Out Sessions:

- **Cheryl DeJournette, Chemistry & Biochemistry**
- **Rebecca Koch, Biological Sciences**
- **Katherine Mott, Physics & Mechanical Engineering**
- **Javeya Williams, Biomedical Sciences**



Break-Out Sessions:

- **Rebecca Koch**
Graduate Student in the Department of Biological Sciences
Chasing Feathers for a Living
- **Dr. Beth Yarbrough**
Director of COSAM Student Services
Majoring in Science and Mathematics at Auburn University
- **Beverley Childress**
COSAM Pre-health Director
Preparing to become a doctor, veterinarian, or other health professional

Career Corner:

- **Mary Beth Lloyd - Representing The Department of Chemistry and Biochemistry**
Retired, Southern Nuclear
- **Ashley Hill- Representing The Department of Mathematics and Statistics**
2nd VP and Actuary, Life and Annuity Division, Protective Life Insurance Company
- **Jill Johnson - Representing the Department of Geology and Geography**
Senior Hydrogeologist, Geosyntec Consultants
- **Amy Grilliott - Representing the Department of Biological Sciences**
Instructor, Troy University
- **Dr. Melissa Bryan - Representing the Department of Physics**
Physics Instructor, Darton State College



Program: Science Matters

Description: A summer enrichment academy for elementary school children in which they attend science-themed weeks filled with experiments, field trips, and make-and-take projects.

Date:

- Tuesday, May 27 – Friday, May 30; 8:00 AM – 5:00 PM
- Monday, June 2 – Friday, June 6; 8:00 AM – 5:00 PM
- Monday, June 16 – Friday, June 20; 8:00 AM – 5:00 PM
- Monday, June 23 – Friday, June 27; 8:00 AM – 5:00 PM
- Monday, July 14 – Friday, July 28; 8:00 AM – 5:00 PM
- Monday, July 28 – Friday, August 1; 8:00 AM – 5:00 PM

Facilities: Parker 352, Parker 354, Parker 356, and Parker 358

Personnel:

AU: Erin Percival, Kristen Bond, Amy Mathis, Allison Tjelmeland, Jacob Varner, Kevin McCulloch, Hannah Keeler, Julia Rich, Katie Texiera, Chloe Chaudhury, Lauren Rodriguez, Nicole Engleman

Non-AU: Rebecca Balkcom (Auburn Junior High School), Frank Ware (Retired, Sanford Middle School), Gina Watkiss (The Heritage School), Hilary Boyd (Auburn Junior High School), Andrew Click (Sanford Middle School), Aleesa Zutter (Yarbrough Elementary School), Dr. Bruce Zutter (Ogletree Elementary School), Cathryn Albright (Dean Road Elementary), Rachel Martin (Yarbrough Elementary School), Amanda Morley (Yarbrough Elementary School), Casey Johnson (Loachapoka High School), Heather Henley, Jill Hill (Yarbrough Elementary School), Rachel Martin (Yarbrough Elementary School), Dahlia Chaudhury

Student Impact:

Number of Students: 175

Student Seats Filled: 368/396 (93% capacity)

Grade Range: rising 1st - 6th



Course Information:**Week #1: May 27 - 30***My Sensational Senses*

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

Branching Out

- Instructor: Dr. Bruce Zutter
- Grades: 3 – 4
- Total Number of Students: 6

Farm to Food

- Instructor: Rebecca Balkcom
- Grades: 3 – 4
- Total Number of Students: 13

Week #2: June 2 - 6*“Bugging” Out!*

- Instructor: Cathryn Albright
- Grades: 1 – 2
- Total Number of Students: 22

Slimy Science – The Encore

- Instructor: Gina Watkiss
- Grades: 3 – 4
- Total Number of Students: 24

Amusement Park Adventure

- Instructor: Andrew Click
- Grades: 5 – 6
- Total Number of Students: 24

Week #3: June 16 - 20*Ticket to Travel*

- Instructor: Amanda Morley
- Grades: 1 – 2
- Total Number of Students: 22

Culinary Chemistry

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

Hot Wired

- Instructor: Frank Ware
- Grades: 5 – 6
- Total Number of Students: 24

Week #4: June 23 - 27*The Body Shop*

- Instructor: Amanda Morley
- Grades: 1 – 2
- Total Number of Students: 22

The Hunger Games

- Instructor: Hilary Boyd
- Grades: 3 – 4
- Total Number of Students: 24

Toying with Physics

- Instructor: Dr. Bruce Zutter
- Grades: 5 – 6
- Total Number of Students: 24

Week #5: July 14 - 18*Jurassic Park*

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

Lego-Mania, Part Deux

- Instructor: Frank Ware
- Grades: 3 – 4
- Total Number of Students: 25

Healthy as a Horse

- Instructor: Casey Johnson
- Grades: 5 – 6
- Total Number of Students: 24

Week #6: July 30 - August 3*Rock Your World*

- Instructor: Cathryn Albright
- Grades: 1 – 2
- Total Number of Students: 22

Do You See What I See?

- Instructor: Hilary Boyd
- Grades: 3 – 4
- Total Number of Students: 24



Program: Summer Science Institute

Description: This relatively new summer science program for outstanding 11th-12th grade students interested in science and mathematics is open to students residing in Alabama or Georgia. Seating was limited to 16 (8 females and 8 males) and was granted on an academically competitive basis. During the program students engaged in real-world applications of science, performed experiments using cutting edge research equipment, and partnered with COSAM researchers to gain lab skills not taught in high school.

Date: Sunday, June 8 - Saturday, June 14 (residential)

Facilities: Auburn Museum of Natural History, Donald E. Davis Arboretum, SCC, SCL, Chemistry Bldg., Parker Hall, Rouse Life Sciences Building, Leach Science Center

Personnel:

AU: Counselors: Chloe Chaudhury (Chemistry/Biochemistry), Daniel James (Math/Statistics), Allison Tjelmeland (Biology), Jacob Varner (Software and Computer Engineering)

COSAM Faculty and Staff:

- Department of Biological Sciences: Dr. Jason Bond, Dr. Paul Cobine, Dr. Debbie Folkerts, Nicole Garrison, Rebecca Godwin, Dr. Wendy Hood, Shawn Jacobsen, Dr. Mark Liles
- Department of Chemistry and Biochemistry: Dr. Anne Gorden, Dr. John Gorden, Dr. Steve Mansoorabadi, Dr. Konrad Patkowski
- Department of Geology and Geography: Dr. Lorraine Wolf
- Department of Mathematics and Statistics: Dr. Chris Rodger
- Department of Physics: Dr. Dave Maurer, Dr. Allen Landers, Dr. Uwe Konopka

Additional AU faculty/staff: Kristen Bond (COSAM Outreach), Scott Clem (Department of Entomology), Mary Lou Ewald (Director of COSAM Outreach), Erin Percival (Assistant Director of COSAM Outreach), Dr. Beth Yarbrough (COSAM Student Services)

Student Impact:

Number of Students: 16

Grade Range: rising 11th - 12th

Counties of residence for student participants:

- Alabama: Chambers, Jefferson, Lee, Madison, Mobile, Montgomery
- Georgia: Columbia, Coweta, Fulton, Muscogee

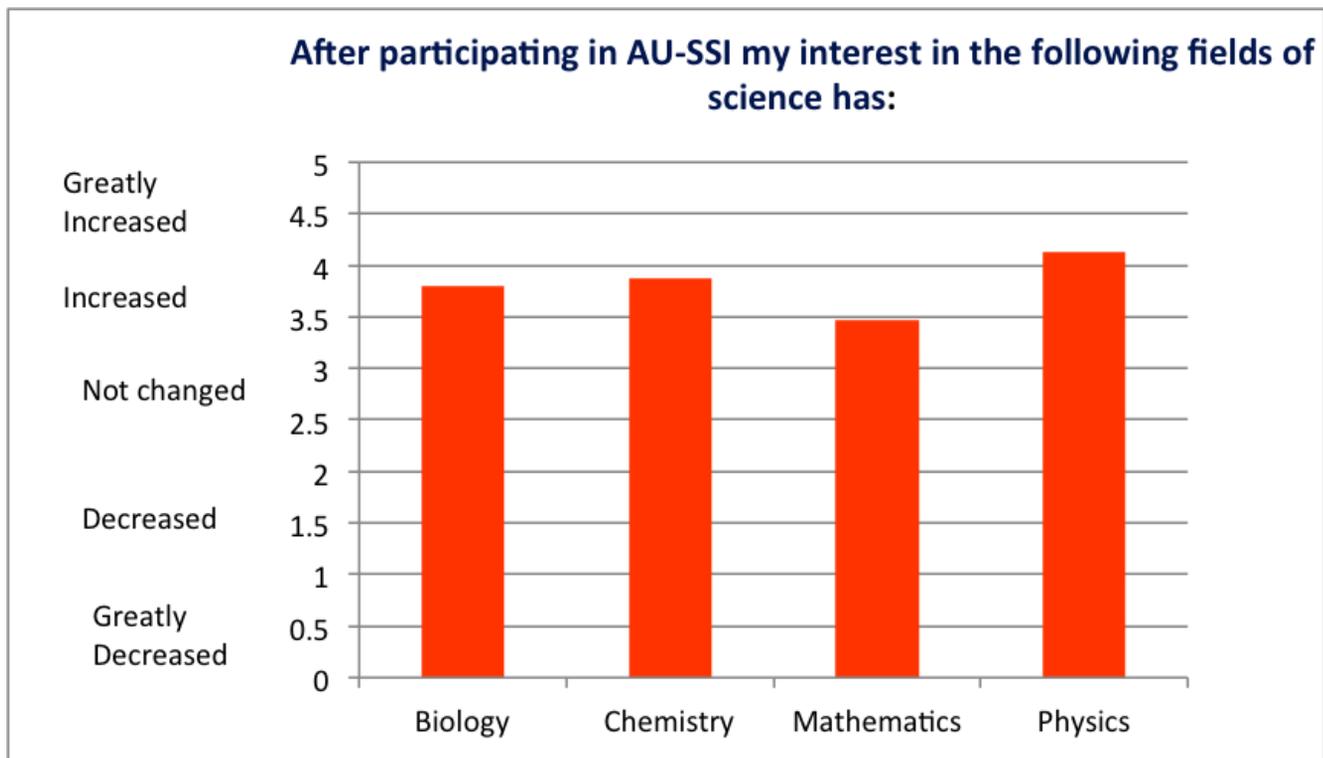


Survey Results:

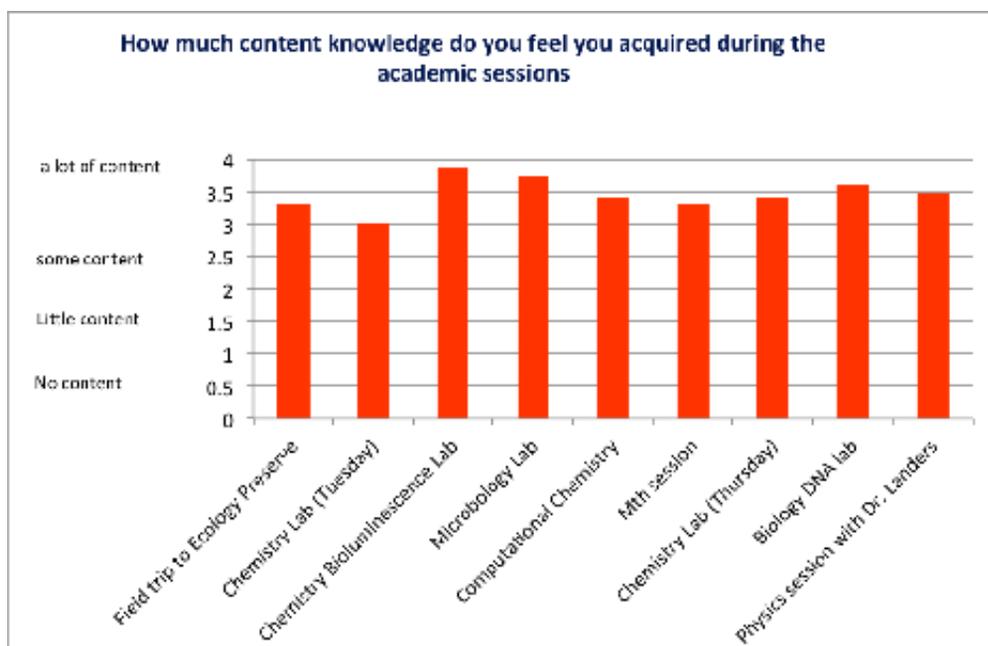
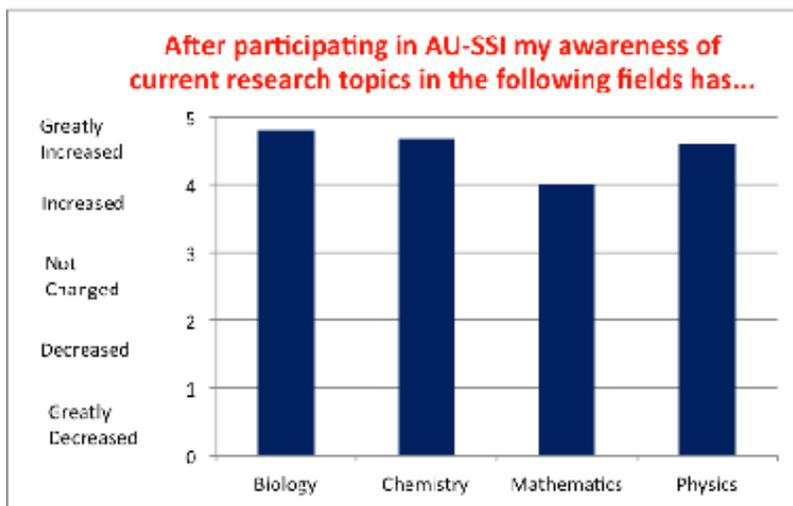
The 2014 Summer Science Institute hosted 16 highly motivated, high achieving students who by a competitive application process showed interest in a future career in the sciences. The average ACT score of the participants was 32.1, with a range of 29 to 35. On the last day of the program, 15 of the 16 participants responded to a 26- question survey. The following section highlights some of the key results of the survey.

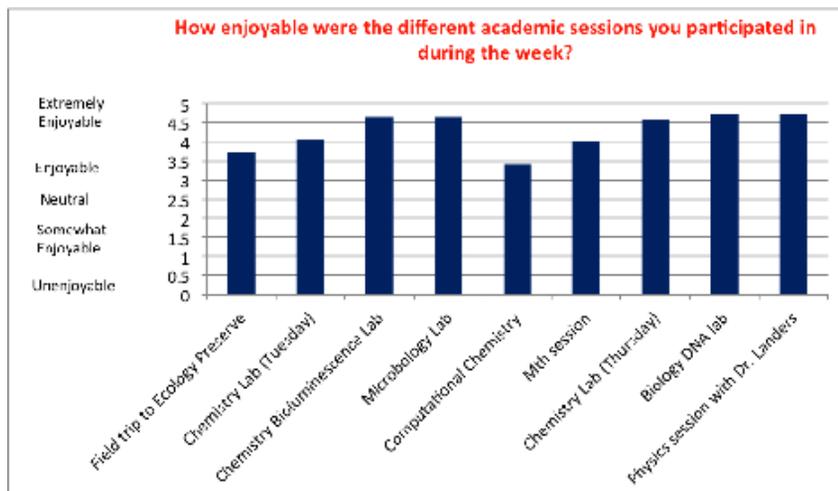
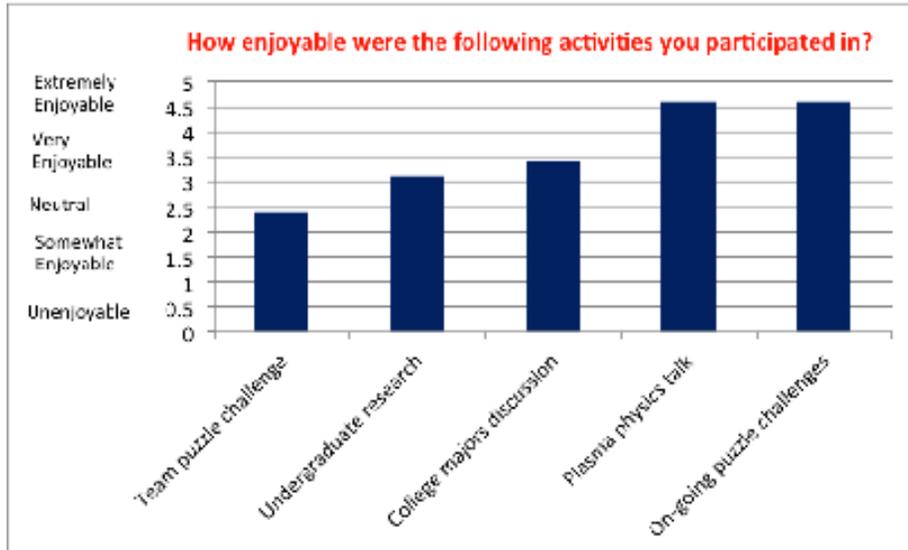
Survey Results:

- 93% of the students indicated they would recommend SSI to a friend.
- 100% of the students reported they were satisfied (13%) or extremely satisfied (87%) with their overall experience at SSI.
- 93% reported an increased interest in attending Auburn University because of SSI.
- 100% reported an increase in their understanding of how to engage in scientific research.
- 93% reported a greater interest in becoming a career scientist after participating in SSI.



- After participating in SSI, 40% of the students reported an increased interest in mathematics, 67% reported an increased interest in Biology, and 80% reported an increased interest in both Physics and Chemistry.
- After participating in SSI, 80% of students reported an increased awareness and knowledge of careers in both biology and mathematics, and 93% reported an increased awareness and knowledge of careers in chemistry and physics.





Program: Robotics Academy

Description: Summer academy for middle school students in which students engage in real-world engineering scenarios that culminate in a friendly competition on the last day of the academy.

Date: Tuesday, June 24 - Friday, July 27; 9:00 AM - 4:00 PM

Facilities: SCL 231

Personnel:

AU: Erin Percival, Kristen Bond, Tj Nguyen, Jacob Varner, Kevin McCullough

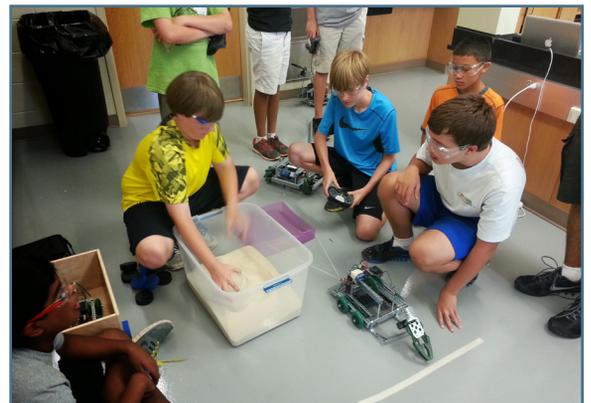
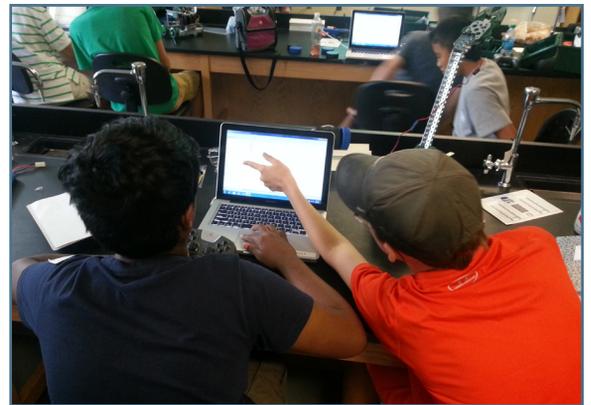
Student Impact:

Number of Students: 17

Grade Range: rising 7th - 9th

Schools Represented:

- Auburn Junior High School
- J.F. Drake Middle School
- Lee-Scott Academy
- Loftis Middle School
- Providence Christian School
- Rising Starr Middle School
- Trinity Christian School



Program: Robotics University

Description: Robotics University is Phase II of the 3-year, \$630,000 Math Science Partnership grant, “RE2-FoCUS”, funded by the Alabama State Department of Education. The RE2-FoCUS acronym was chosen carefully by the proposing team of scientists and educators to reflect the importance of providing teachers with the professional development needed to be effective mentors in a project-based, active inquiry learning environment. The aim is to furnish teachers with the foundational tools to ‘re-focus’ their instructional strategies as the state and nation undergo a transition to establish new science standards designed to effectively prepare students for high-tech workforce needs in addition to inspiring the innovative capacity of our citizenry through K-12 science education. Alabama is fortunate to have two strong statewide programs - AMSTI and BEST Robotics - that if more closely aligned with each other, could aid science teachers in meeting these needs. The RE2-FoCUS Initiative utilizes the statewide networks that AMSTI and BEST Robotics have established between K-12, higher education and industry over the past 10 years to provide effective, content-deepening professional development to middle school teachers, AMSTI specialists, and STEM faculty at 2- and 4-year colleges associated with BEST.

In 2014, COSAM faculty and outreach personnel, along with technology faculty from Ivy Tech Community College in Indiana conducted a series of robotics education workshops (“Robotics University”) during the summer. Each workshop consisted of 4 days (approximately 25 hours) of intense training on the VEX robotics design systems – the same systems used in the BEST Robotics program. During this training, teachers enhanced technological skills through hands-on training in robot design, construction, operation, and computer programming with Easy-C programming language. Science and math content lessons related to optimizing robotic function were integrated throughout the training. Topics included simple machines, motion, force, power, along with the basic algebra and trigonometry used in applying these concepts to real situations. To enhance the capacity of each BEST hub to provide meaningful, content rich robotics workshops in their region in future years, BEST hub personnel were invited to attend the workshops at AU.

Date: July 8-11 and July 22-25

Facilities: SCL 231, SCC 115

Personnel:

AU: Mary Lou Ewald, Allen Landers, Tj Nguyen, Christina Steele, Jacob Varner, Kevin McCullough

Non-AU: Dan Ward, Kyle Wylie, Kyle Love

Impact:

Schools Served (county):

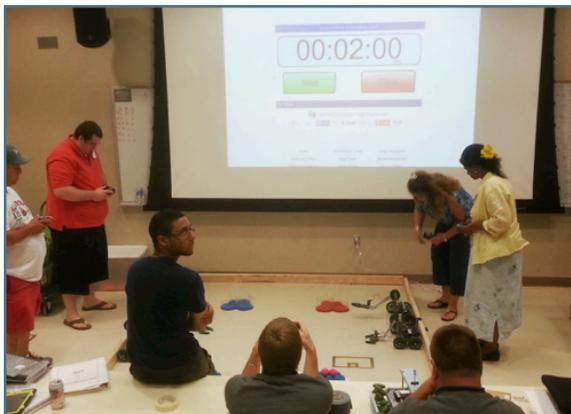
- Bankhead Middle School (Walker)
- Buckhorn Middle School (Madison)
- Carver Magnet (Houston)
- Centreville Middle School (Bibb)
- Christian Alternative (Jefferson)
- Clements High School (Limestone)
- DA Smith Middle School (Dale)
- East Elementary School (Cullman)
- Fairview Middle School (Cullman)

- Hanceville Middle School (Cullman)
- Jefferson Christian Academy (Jefferson)
- JF Drake Middle School (Lee)
- Vernon Intermediate (Lamar)
- Lexington (Lauderdale)
- Lincoln High School (Talladega)
- Meridianville Middle School (Madison)
- Millbrook Middle School (Elmore)
- Moulton Middle School (Lawrence)
- Muscle Shoals Middle School (Colbert)
- Pike County High School (Pike)
- Pleasant Valley High School (Calhoun)
- Russellville Middle School (Franklin)
- Springwood School (Chambers)
- W.F. Burns Middle School (Chambers)
- W.L. Radney Middle School (Tallapoosa)
- Wetumpka Middle School (Elmore)
- Winfield Middle School (Talladega)
- Zora Ellis Jr. High School (Talladega)
- Cleburne County School System (Cleburne)

3 BEST hub personnel attended from the following hubs:

- Central Alabama BEST
- Northeast Alabama BEST
- Northwest Alabama BEST

Total Teachers Served: 35



Program: Auburn Mathematical Puzzle Challenge (AMP'd)

Description: A math puzzle-based challenge in which kids deepen their critical thinking skills through a series of applied math problems in a thematic setting.

Date: Saturday, September 13, 2014, 8:00 AM – 4:00 PM

Facilities: Parker Hall, Science Center Auditorium

Personnel:

AU: Mary Lou Ewald, Kristen Bond, Amy Mathis, TJ Nguyen, Allison Tjelmeland, Hunter Whitten, Jacob Varner, Amber Derouen, Khorizon Dunn, Andrew Owens, Katherine Perry, Aras Erzurumluoglu, Dr. Jessica McDonald, Math Graduate Students

Student Impact:

Number of Students: 120

Grade Range: 7th -8th

Schools Served:

- Alabama Christian School
- Arnall Middle School
- Beulah High School
- Central Educational Center
- East Coweta Middle School
- Evans Middle School
- Lee Middle School
- Madras Middle School
- Montgomery Catholic Prep. School
- Saint James School
- Sanford Middle School
- Smokey Road Middle School



Program: Project Lead The Way (PLTW) Alabama and Mississippi State Conference

Description: A PLTW Counselor Conference, or PLTW State Conference, is designed to inform school counselors, post-secondary advisors, principals, teachers and school administrators about the PLTW programs and student recruitment. PLTW schools are required to send a minimum of one advisor/counselor annually. PLTW recommends that schools send all of their advisors/counselors to at least one conference during their tenure with the school.

The 2014 PLTW state conference for teachers, counselors and administrators from Alabama and Mississippi was co-hosted by COSAM Outreach and the WISE Institute. Twenty-eight breakout sessions were offered at the one-day conference. Keynote speakers included Dr. Philip Cleveland, the Director of the Office of Career and Technical Education/Workforce Development for the Alabama State Department of Education, and Dennis Dio Parker, Assistant Manager at the Toyota North American Production Support Center in Georgetown, Kentucky.

Date: Thursday, October 9, 2014

Facilities: AU Student Center

Personnel:

AU: Mary Lou Ewald, Bonnie Wilson, Kristen Bond, Tania McKey, Amy Mathis, Linda Newton

Non-AU: Shabaka McKey (PLTW)

Impact:

Number of Participants: 242 teachers, school administrators, counselors, and other STEM stakeholders

Vendors: Pasco Scientific, Whitebox Learning

Sponsors/Donors: Chevron, 3-D Molecular Designs, Cell Zone, Edvotek, Fisher Scientific Education, Inspiration Software, Inc., RobotShop.com, Sargent Welch, Ward's Science, Science Take-Out, Zahourek Systems.



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:

1. 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.
2. To increase the number of students from underrepresented groups in rural Alabama participating in high quality, meaningful science and engineering research projects.
3. To increase positive student attitudes towards STEM through interactions with university research mentors who serve as role models for the students.
4. To build a sustainable relationship between Auburn University and regional public schools.

This one-day workshop provided an opportunity for the AU team to meet the first cohort of Teacher Fellows who will be involved in the program for the next 3 years, and to provide an overview of the Science Fair system and how to mentor students on a Fair project. We will follow up with a one-week professional development during summer 2015 with this same cohort of 18 teachers.

Date: Thursday, October 16, 2014

Facilities: AU Student Center

Personnel:

AU: Mary Lou Ewald, Allison Tjelmeland (COSAM Outreach), Allen Landers (Physics), Virginia Davis (Chemical Engineering), Paul Cobine (Biology), Joni Lakin (College of Education)

Impact:

Number of Participants: 18 teachers from the following school systems: Auburn City, Opelika City, Lowndes County, Dothan City

Program: War Eagle BEST

Description: Middle and high school robotics program

Date:

- Wednesday, August 27th; 6:00 – 8:00 PM (Kick Off Day)
- Sunday, September 28th; 12:00 – 5:00 PM (Mall Day)
- Friday, October 10th; 12:00 – 5:00 PM (Competition Day)
- Saturday, October 11th; 7:00 AM – 5:00 PM (Competition Day)

Facilities: AU Student Center, Opelika High School, Lee-Scott Academy, Auburn Mall

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kristen Bond, Kathy Feminella, George Blanks, Linda Newton, Chloe Chaudhury, Amber Derouen, Khori Dunn, Jacob Varner, Hunter Whitten, Tj Nguyen, Allison Tjelmeland, and various student volunteers and judges

Non-AU: Pete O’Day, Dan Schnittka, Lucas Hunter, and various judges

Student Impact:

Number of Students: ~700

Grade Range: 6th - 12th

Schools Served:

- Autauga Academy
- Brewbaker Technology Magnet High School
- Central Educational Center
- Benjamin Russell High School
- Eastwood/Cornerstone School
- Edward Bell Career Technical Center
- Glenwood School
- LAMP High School
- Lanett High School
- Lee-Scott Academy
- Loachapoka High School
- Millbrook Middle School
- Montgomery Catholic Preparatory School
- Opelika High School
- Opelika Middle School
- Prattville High School
- Saint James School
- Smiths Station High School
- Southside Middle School
- Spencer High School
- Wetumpka High School
- Wetumpka Middle School



Bladerunner Story Line

Wind energy is an important topic of the present and the future, providing the world with sustainable clean energy. The enormity of the present day wind turbines continues to grow. The weight of the components, the axle load (total weight resting on a given axle) must be distributed across many axles so that the maximum weight-per-axle limits are not exceeded. This makes the transport vehicles very long and heavy.

The engineering challenge is to design a vehicle that can transport these large turbines without negatively affecting America's transportation system. Due to the potential roadway damage, transportation law requires an Over Size Over Weight (OSOW) permit be obtained prior to transport. Additionally, some environmentally sensitive areas exist which hamper the development of the infrastructure required to deliver the components to the assembly site. The transportation path travels through the habitat of an endangered species (Prairie Chicken Environments). Federal law requires relocation of endangered species to an acceptable alternative habitat.

The goal of a BEST team is to create a robot that can help with the task of moving these wind turbines. An agreement with your neighboring company can be made allowing the cooperating teams to work together with a mix of parts on the small and large turbines.

BEST Award Winners

1st Place: Wetumpka High School*

2nd Place: Eastwood/Cornerstone School*

3rd Place: Springwood School

4th Place (finalist): Saint James School

Game Winners

1st Place Robotics: Southside Middle School*

2nd Place Robotics: Lee-Scott Academy*

3rd Place Robotics: Wetumpka High School*

4th Place Robotics (finalist): Eastwood/Cornerstone School*

*Advanced to South's BEST Regional Competition

Sponsors of the Program

Briggs & Stratton

Neptune Technology Group

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Boeing

Donaldson Company Foundation

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Southern Company

Southern Nuclear

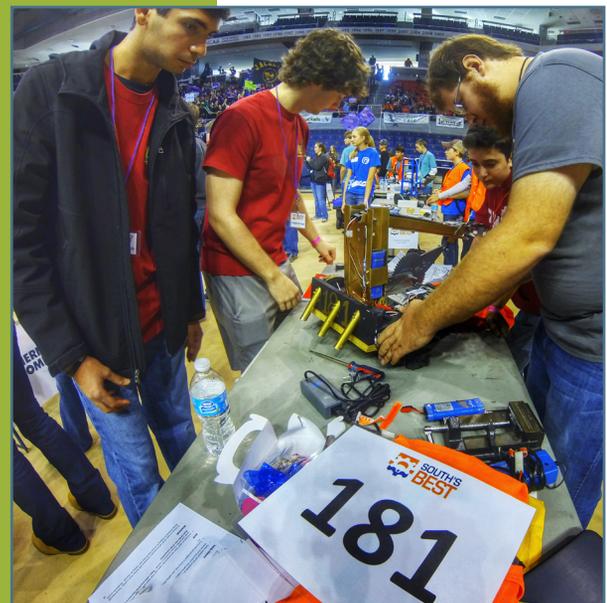
Hyundai Motor Manufacturing Alabama

Northrop Grumman Corp.

Alabama National Guard

AU Outreach

AO Tourism Board



Program: South's BEST**Description:** Middle and high school robotics championship**Date:** Friday, December 5th; 3:00 – 6:30 PM (Competition Day and Hub Council Meeting)
Saturday, December 6th; 7:00 AM – 9:00 PM (Competition Day)
Sunday, December 7th; 7:00 AM – 5:00 PM (Competition Day)**Facilities:** Auburn Chamber of Commerce, Wiggins Hall, SCC, SCL, SCA, and AU Arena**Personnel:**

AU: Mary Lou Ewald, Kristen Bond, Kathy Feminella, George Blanks, Chloe Chaudhury, Amber Derouen, Khori Dunn, Peter Jones, TJ Nguyen, Allison Tjelmeland, Jacob Varner, and various student volunteers and judges

Non-AU: Lucas Hunter (Head Ref), Pete O'Day (Field Construction), Dan Schnittka (Technical Director), Matt Schuster (Production Manager), Science teachers from participating schools

Student Impact:

Number of Students: ~2,000

Grade Range: 6th - 12th**Schools Served:**

- Academy for Science and Foreign Language (Tennessee Valley)
- Annunciation Catholic School (Mississippi)
- Baker High School (Tennessee Valley)
- Baton Rouge Magnet High School (NOLA)
- Briarwood Christian School (Blazer)
- Brindlee Mountain Middle School (NE Alabama)
- Brookhaven Academy (Mississippi)
- Brooks High School (NW Alabama)
- Brown-Barge Middle School (Emerald Coast)
- Carroll High School (Wiregrass)
- Central Magnet School (Music City)
- Corinth School District (Mississippi)
- Covenant Christian School (NW Alabama)
- Creekside Academy (NW Alabama)
- Delhi Charter School (LA Tech)
- Demopolis City Schools (Shelton)
- Dickson Area Robotics Team (Music City)
- Discovery School (Music City)
- Eastwood/Cornerstone Schools (War Eagle)
- Episcopal Day School (Central Alabama)
- Evangel Christian School (Blazer)
- Faith Academy (Jubilee)
- Fernbank LINKS (Georgia)
- Good Hope Middle School (North Alabama)
- Hale County High School (Shelton)
- Holly Pond High School (North Alabama)
- Holy Cross School (NOLA)
- John T. Morgan Academy (Selma)
- Lee-Scott Academy (War Eagle)

Schools Served (cont'd)

- Lindsay Lane Christian Academy (Tennessee Valley)
- MACH Robotics (Jubilee)
- Marshall Technical School (NE Alabama)
- Martin Middle School (Selma)
- Merrol Hyde Magnet School (Music City)
- Mississippi School for Mathematics & Science (Mississippi)
- North Cobb Christian School (Georgia)
- Northside High School (Shelton)
- Northview High School (Georgia)
- Oak Mountain High School (Blazer)
- RCS Engineering (NW Alabama)
- Rehobeth Middle School (Wiregrass)
- Saline High School (LA Tech)
- Southside Middle School (War Eagle)
- Spain Park High School (Blazer)
- Spanish Fort High School (Jubilee)
- St. Luke's Episcopal School (Jubilee)
- Starkville Christian Home Educators (Mississippi)
- Starkville High School (Mississippi)
- Sweet Water High School (Jubilee)
- Sylacauga High School (Central Alabama)
- Talladega Career Tech Center (Central Alabama)
- W.P. Davidson High School (Jubilee)
- Wetumpka High School (War Eagle)
- Wicksburg High School (Wiregrass)
- Woodham Middle School (Emerald Coast)
- Woodlawn Beach Middle School (Emerald Coast)

Sponsors of the Program

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 Walmart Foundation
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 Southern Company
 Southern Nuclear
 Hyundai Motor Manufacturing Alabama
 Northrop Grumman Corp.
 Alabama National Guard
 AU Outreach
 AO Tourism Board

BEST Award Winners

- 1st Place - Central Magnet School (Music City BEST)
 2nd Place - Wetumpka High School (War Eagle BEST)
 3rd Place - Brooks High School (Northwest Alabama)

Robotics Award Winners

- 1st Place - Merrol Hyde Magnet School (Music City BEST)
 2nd Place - Evangel Christian School (Blazer BEST)
 3rd Place - MACH Robotics (Jubilee BEST)
 Finalist - Central Magnet School (Music City BEST)



Steering Team

Co-Directors

Mary Lou Ewald, George Blanks

Awards/Judging Coordinator

Mary Lou Ewald

Awards/Judging Assistant

Chloe Chaudhury

Emcee

Greg Womble

Field Management

George Blanks

Floor Boss

TJ Nguyen

Graphic Design

Khorizon Dunn

Wally Ridgway

Head Judge

Peter Jones

Head Referee

Luke Hunter

Head Field Referees

Danny Coleman

Matthew Westberry

Represented Hubs

Blazer BEST

University of Alabama-Birmingham

Birmingham, Alabama

Central Alabama BEST

Central Alabama Community College

Talladega, Alabama

Emerald Coast BEST

University of West Florida

Pensacola, Florida

Georgia BEST

Southern Polytechnic State University

Marietta, Georgia

Jubilee BEST

Mobile, Alabama

LA Tech BEST

Louisiana Tech University

Ruston, LA

Hospitality

Kathy Feminella

Pit Bosses

Joey Giuliano

Dan Schnittka

Photography

Barbara Bryan

Production Manager

Matt Schuster

Registration and Sales

Allison Tjelmeland

Head Scorekeeper

Jacob Varner

Signage

Wally Ridgway

Staging

Sue Mitchell

Team Advocates

Michael Colletti

Mark Rose

Mississippi BEST

Mississippi State University

Starkville, Mississippi

Music City BEST

Lipscomb University

Nashville, Tennessee

NOLA BEST

Redstick Robotics

New Orleans, LA

North Alabama BEST

Wallace State Community College

Hanceville, Alabama

Northeast Alabama BEST

Northeast Alabama Community College

Rainsville, Alabama

Northwest Alabama BEST

Northwest Shoals Community College

Muscle Shoals, Alabama

Team Coordinator

Kristen Bond

Technical Coordinator

Dan Schnittka

Video Production/Coordination

Greg Ruff

Volunteer Coordination

Amber Derouen

Christina Giuliano

Webmaster

Jacob Varner

WISE Breakfast Coordinator

Bonnie Wilson

Selma BEST

Wallace Community College

Selma, AL

Shelton State BEST

Shelton State Community College

Tuscaloosa, AL

Tennessee Valley BEST

Calhoun Community College

Decatur, Alabama

War Eagle BEST

Auburn University

Auburn, Alabama

Wiregrass BEST

Dothan, Alabama

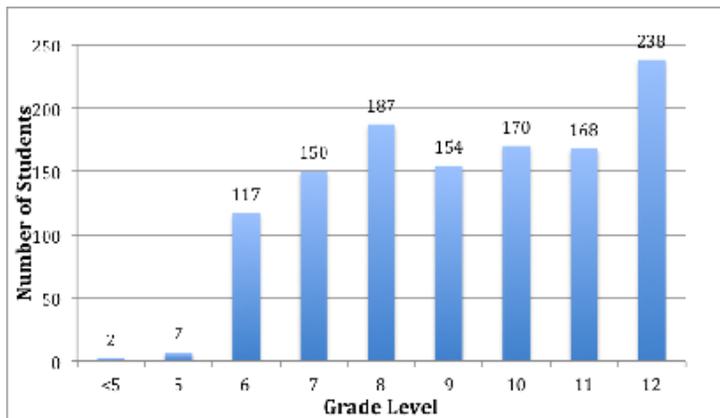
2014 South's BEST Student Survey Summary

Introduction

The 2014 South's BEST Robotics Championship Competition was held December 6-7 at the Auburn Arena on the campus of Auburn University. Fifty-six (56) teams from six states were in attendance, with 36 of the teams (64%) from Alabama. The other represented states included Georgia, Florida, Mississippi, Louisiana, and Tennessee. A total of 1,206 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.

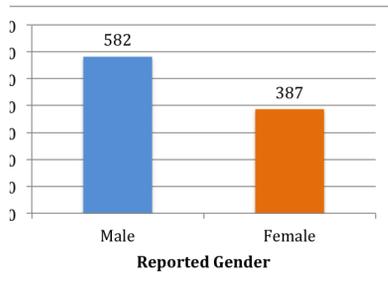
Grade Level

Of the 1,206 students who completed surveys, 1,194 provided his or her grade level. Middle School students (5th-8th grade) accounted for 461 (38%) of student attendees, while 724 (60%) students reported being in high school (9th – 12th grade).



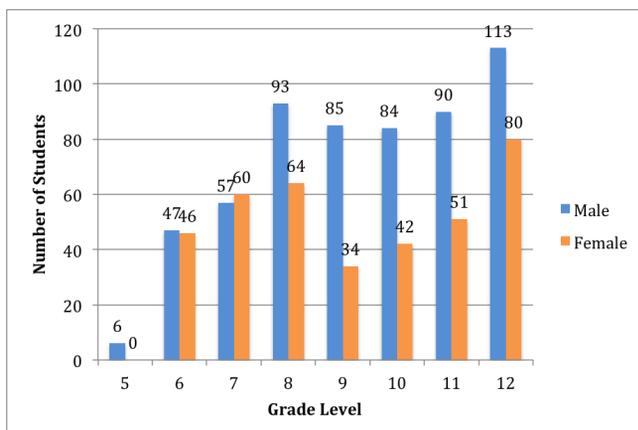
Gender

Of the 1,206 completed surveys, 969 students provided their gender; 387 (40%) were female and 582 (60%) were male.



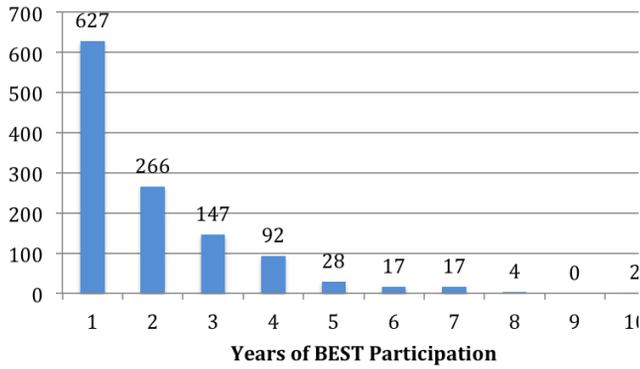
Gender by Grade Level

Of the 1,206 completed surveys, 952 students provided both their grade level and their gender: 377 female and 575 male.

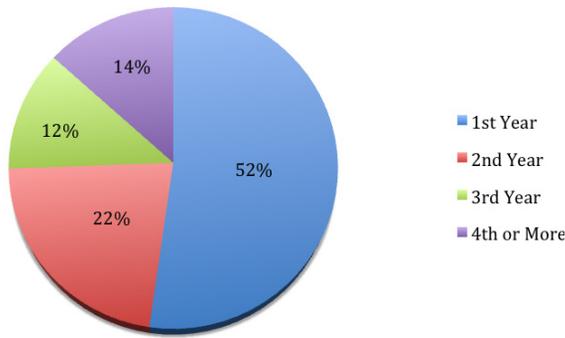


Years in the Program

Of the 1,206 completed surveys, 1,200 students provided the number of years they've participated in BEST. There were 627 first year students, accounting for 52% of attendees; there were 266 second year students, accounting for 22% of students; a total of 147 students were in their third year of BEST, comprising 12% of attendees; and there were 160 students who have participated for four or more years, accounting for 14%.

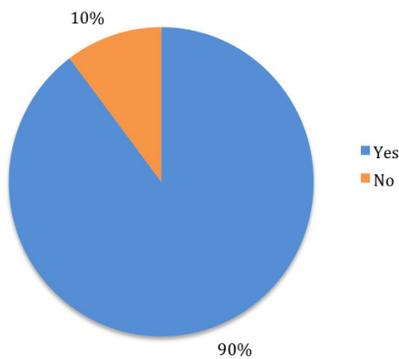


As the program continues to grow, new teams and competition sites are added each year, which attracts a new group of students. This data represents the innovation and competitive spirit of first year teams and participants.



Increased Interest in STEM

Of the 1,206 complete surveys, 1,197 responded to the question. 1,073 (90%) expressed an increased interest in math, science, and/or engineering because of their participation in BEST.



Plans to Attend College

Of the 1,206 completed surveys, all students responded and 13 students did not plan to attend college (1%), while 1,193 did (98.9%). Of those who did not plan to attend college, one was female, eight were male, and four did not report their gender.

From the completed surveys, there were 722 high school students who indicated that they intend to attend a college or university. Of these 722 surveys, 260 students chose three or more schools or were completely undecided, accounting for 36% of high school responders.

Of 722 high school students who plan to attend a college or university, only 596 students indicated which school(s) they were interested in attending. The following were listed as primary schools of interest:

Auburn-18.8%	Vanderbilt-2.4%	University of Mississippi-1.4%
Alabama-9.6%	University of North Alabama-2.4%	Louisiana Tech-1.1%
Mississippi State University-8.1%	Massachusetts Institute of Technology-2.3%	Middle Tennessee State University-1.1%
Georgia Tech-6.1%	Louisiana State University-1.5%	Jacksonville State University-0.94%
University of South Alabama-4.5%	Stanford University-1.4%	University of Georgia-0.94%
University of Alabama-Birmingham-2.8%	University of Alabama-Huntsville-1.4%	Other-16.1%

Fields of Study

Below is a listing of the fields of study, college-bound high school students indicated they were planning to pursue in college. Fifty-six percent of students indicated an interest in pursuing a STEM career.

- **Engineering/Computer Science - 32%**
- **Medicine/Health/Veterinary/Nursing - 14%**
- Fine Arts - 8%
- Science - 8%
- Other - 7%
- Architecture/Design/Construction - 6%
- Business - 6%
- Education - 3%
- Criminology/Law - 4%
- Psychology/Social Work - 3%
- Undecided - 3%
- History/Literature/English - 2%
- **Mathematics - 2%**
- Agriculture - 1%
- Communications/Journalism - 1%

College Interest Among High School Students

Thirteen students said they had no plans of attending college, eight of which were in high school. There were 722 high school students that responded with intentions to attend some college or university.

A major was selected by 701 of the college-bound high school participants (students were able to select more than one major), with the remaining 21 students indicating undecided. Engineering/Computer Science was selected by 37.1% of the college-bound high school students, while COSAM (including medicine) majors accounted for 21.6% of the students. Within COSAM majors, 64.5% of choices were health related, while the remaining 35.5% chose sciences. High school students who selected “other” accounted for 6.7% of the total responding population, not including those who filled in undecided.

The following represents the percentage breakdown of the other choices of study:

- Agriculture 0.97%
- Architecture 5.4%
- Business 6.5%
- Communications or Journalism 0.97%
- Criminology or Law 3.5%
- Education 2.2%
- Fine Arts 6.4%
- History, Literature, or English 1.7%
- Mathematics 0.97%
- Psychology/Social Work 3.8%



Student Survey 2014

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 Fine Arts (art, music, film, theatre)
 Architecture/ Design/ Construction History/ Literature/ English
 Business (marketing, accounting, aviation, etc) Mathematics
 Communications/ Journalism Medicine/ Health/ Veterinary/ Nursing
 Criminology / Law Psychology/ Social Work
 Education Science (chemistry, biology, physics)
 Engineering/ Computer Science 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?

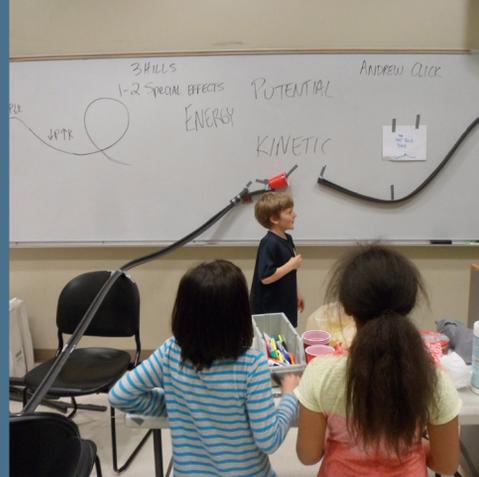
- Yes
 No

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 schools' BEST team?

- Team Member Visitor





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