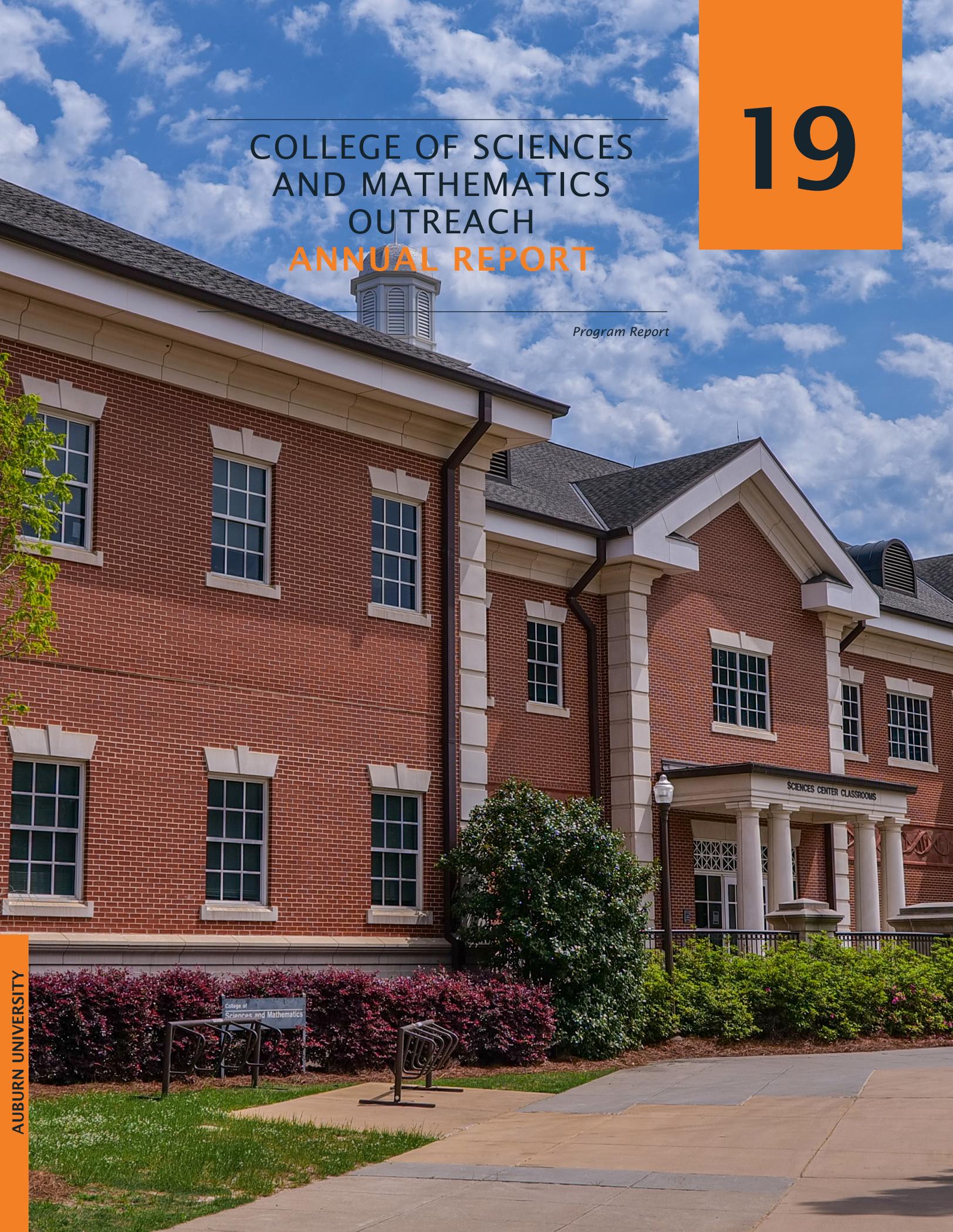

COLLEGE OF SCIENCES
AND MATHEMATICS
OUTREACH
ANNUAL REPORT

19

Program Report



ANNUAL COSAM OUTREACH PROGRAM REPORT

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COSAM OUTREACH

MESSAGE FROM THE DIRECTOR

◆
Mary Lou Ewald



In 2019, COSAM Outreach hosted over 10,000 students, parents, teachers, and community members at events on and off the Auburn University campus. A total of 18 on-site programs, with 62 contact days, were hosted/sponsored by the office, reaching more than 280 schools. While these numbers do not adequately quantify the excitement and enthusiasm of exposure to Science, Technology, Engineering, and Math (STEM), they begin to tell a story of the growing importance of STEM experiences in the lives of today's youth.

Our programs range from one-day events to more in-depth/residential programs like the Summer Science Institute. All have varying impacts, but one goal — exposure to STEM. One of our popular programs, Destination STEM, was restored this year to share the excitement of a variety of STEM activities with a large audience.

COSAM outreach is also home to the Southeastern Center of Robotics Education (SCORE). What began just three years ago in response to an increased demand for robotics in school curricula has developed into a passion for both students and teachers. One of SCORE's events, Mission 200, had tremendous success in 2019 as 265 new VEX-IQ robotics teams (consisting of approximately 1,325 elementary and middle school students) were implemented across Alabama and Tennessee. SCORE staff trained over 200 teachers at ten regional workshops. This professional development focused on how to provide a more interactive and hands-on learning environment for students. These teachers have said Mission 200 changed the way they teach. Robotics is not just about robots — it's a valuable tool used to engage students. For more information on SCORE, visit www.scoreau.org.

Each year our programs grow and evolve to meet the current demands of the community. The students, teachers, parents, and faculty involved with COSAM Outreach continuously share what they learn, helping ignite the STEM movement in Alabama and beyond. Please take a moment to review our 2019 annual report for more information on this past year's achievements.

COSAM Outreach is dedicated to educating and inspiring the youth of today in the fields of science, technology, engineering, and mathematics. Numerous events, competitions, workshops, and programs throughout the year accomplish this task targeted to k-12 students and their teachers and parents. The ultimate goal is to foster growth in those that wish to enter a STEM career.

MARY LOU EWALD
Director, COSAM Outreach

COSAM OUTREACH
IMPACT



2019

The Numbers

18

UNIQUE EVENTS AND PROGRAMS

62

TOTAL PROGRAM DAYS

10,305

*APPROXIMATE STUDENTS, TEACHERS, AND
PARENTS IMPACTED ON CAMPUS*

281

UNIQUE SCHOOLS REACHED

COSAM OUTREACH MISSION AND GOALS

2019

MISSION

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

"In the 21st century, scientific and technological innovations have become increasingly important as we face the benefits and challenges of both globalization and a knowledge-based economy. To succeed in this new information-based and highly technological society, students need to develop their capabilities in STEM to levels much beyond what was considered acceptable in the past."

-The National Science Foundation

GOALS

- ◆ Encourage interest in the sciences in K-12 students
- ◆ Engage K-12 students and teachers in relevant and inspiring science and math experiences
- ◆ Motivate K-12 students to reach their full potential in science by providing them with access to exciting, hands-on laboratory activities, enthusiastic science mentors, and a supportive environment that encourages intellectual development
- ◆ Provide opportunities for Auburn University faculty and undergraduate and graduate students to share their passion for science and math with a broad audience
- ◆ Provide professional development opportunities for K-12 teachers to improve the quality of science and math education

OUR STUDENTS LEARN

Photo:

Students at Destination STEM explore a virtual reality sandbox.



AUBURN UNIVERSITY

COSAM OUTREACH
FACULTY AND
STAFF

The Team

STEM OUTREACH
ENLIGHTENS

MARY LOU EWALD

DIRECTOR

As the director of outreach for the College of Sciences and Mathematics, Mary Lou’s primary responsibilities include oversight and management of STEM outreach programs. She serves as the director of AU Science in Motion, SCORE, Co-PI of AU-AMSTI, and is 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.

Mary Lou is a graduate of Auburn University and has been working in COSAM Outreach for 24 years.



VERONICA MORIN

ASSISTANT DIRECTOR OF OUTREACH

As the assistant director of outreach for the College of Sciences and Mathematics, Veronica’s primary responsibilities include assisting Mary Lou with grant-related activities and overseeing the State Science Olympiad, Summer Science Institute, AMP’d, Science Matters and assisting with all other programs.



JENNIFER SPENCER

*ASSISTANT DIRECTOR OF SOUTHEASTERN
CENTER OF ROBOTICS EDUCATION*

As the assistant director for SCORE, Jennifer’s primary responsibilities include overseeing the Southeastern Center for Robotics Education which is designed to promote and grow robotics in the K-12 community. Jennifer works on all VEX related events, BEST Robotics, as well as helping with other programs.



TEDDY DUBOSE

ACCOUNTANT III

As the accountant for the College of Sciences and Mathematics Outreach Office, Teddy oversees all budgets and finances. Teddy also serves as office manager, oversees the student workers on a day-to-day basis, and helps in other areas as necessary.



KRISTEN JACKSON

OUTREACH PROGRAM COORDINATOR

As an outreach program coordinator for the College of Sciences and Mathematics, Kristen's primary responsibilities are assisting Mary Lou and Veronica in areas such as Science Matters, Destination STEM, AMP'd, Science Olympiad, and other programs as necessary.



JANIE MARINO

OUTREACH PROGRAM COORDINATOR

As an outreach program coordinator for the College of Sciences and Mathematics, Janie's primary responsibilities include leading the STEM-IQ teacher training and directing the Greater East Alabama Regional Science and Engineering Fair. She also assists in many other programs.

COSAM OUTREACH STUDENT EMPLOYEES



CARA BRITTAIN

DOCTORAL ASSISTANT

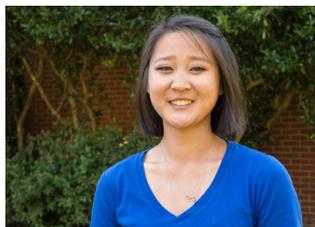
Major: Biology
Second Year Graduate Student
1st year in COSAM Outreach



GRACE HOLLAND

STUDENT PROGRAM ASSISTANT

Major: Wildlife Sciences
Senior
2nd year in COSAM Outreach



GRACE DENNISTIN

STUDENT PROGRAM ASSISTANT

Major: Industrial Design
Senior
3rd year in COSAM Outreach



JONATHAN SNELL

STUDENT PROGRAM ASSISTANT

Major: Psychology
Sophomore
2nd year in COSAM Outreach



MEGHAN FULLER

STUDENT PROGRAM ASSISTANT

Major: Psychology
Senior
2nd year in COSAM Outreach

OUR STUDENT
WORKERS **CREATE**



COSAM OUTREACH 2019 CALENDAR

Our Programs

AJAS Scholarship Competition	January 25th
AMP'd – High School	January 26th
AMP'd – Middle School	February 23rd
VEX State Tournament	March 1st – March 3rd
GEARSEF – Junior Division	March 6th
GEARSEF – Senior Division	March 7th
Spring into Science	March 26th
State Science Olympiad	March 30th
Elementary Regional Science Olympiad	April 13th
Science Matters	June 3rd – July 26th
Summer Science Institute	June 9th – 15th
College Quest Academy STEM Discovery Day	June 27th
AP Institute	July 8th – 11th
State Science Olympiad Directors Workshop	August 14th
Destination STEM	September 20th
GEARSEF Teacher Training	October 17th
AMP'd – High School	October 26th
GUTS	November 19th
South's BEST	December 6th – 8th

ALABAMA JUNIOR ACADEMY OF SCIENCE SCHOLARSHIP COMPETITION

Program Date:

Friday, January 25th

Number Impacted:

9

Participating Schools:

Auburn High School

Auburn Junior High School



The Alabama Junior Academy of Science (AJAS) Scholarship Competition is a scientific paper reading competition. Auburn University hosted the regional competition in 2019 and the winners advanced to a state and then national competition.

Entrants are required to have a scientific paper describing original research or a project. Scientific work may have been done in conjunction with a summer science program or in a supervised year-round environment.

Photo:

The Sciences Center Laboratory Building.

THE FUTURE
IS BRIGHT

AUBURN MATHEMATICAL PUZZLE CHALLENGE (AMP'D) HIGH SCHOOL

Program Dates:

Saturday, January 26th

Saturday, October 26th

Number Impacted:

210

Participating Schools:

Auburn High School

Beauregard High School

Cleveland High School

East Coweta High School

Eastwood Christian School

Enterprise High School

First Baptist Opelika Christian School

LAMP High School

Lakeview Christian School

Lee-Scott Academy

The Montgomery Academy

Montgomery Catholic Preparatory School

Newnan High School

Pike Road High School

Saint James School

Smiths Station High School

Troup High School

The Auburn Mathematical Puzzle Challenge (AMP'd) is a one day, math and puzzle solving competition. High school AMP'd students compete in teams of five to eight to solve 12 puzzles and a final meta-puzzle.

Puzzles are created by Eric Harshbarger, a faculty member in the Math department at Auburn University. The students solve various challenges that range from logic puzzles to math problems with unique physical puzzles in between. AMP'd offers a fun spin on a traditional math competition that students continue to enjoy each year. The 2019 competitions were pirate and Halloween themed.



PARTICIPANTS
ACHIEVE

AUBURN MATHEMATICAL PUZZLE CHALLENGE (AMP'D) MIDDLE SCHOOL

Program Date:

Saturday, February 23rd

Number Impacted:

125

Participating Schools:

Beverlye Magnet School

Central Educational Center

First Baptist Opelika Christian School

Lee-Scott Academy

Madras Middle School

Montgomery Catholic Preparatory School

Opelika Middle School

Pizitz Middle School

Sanford Middle School

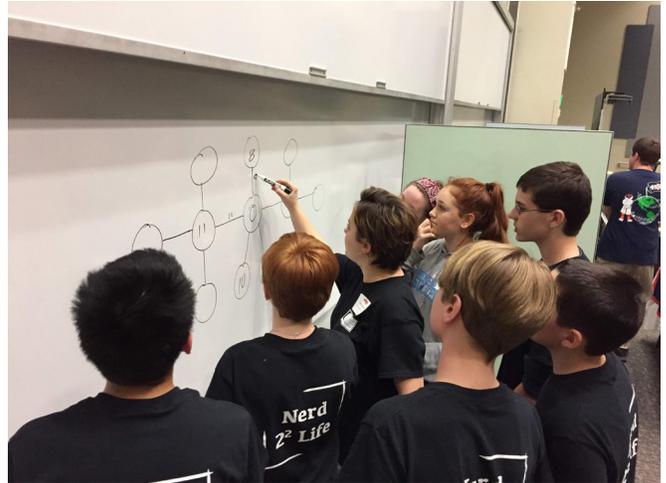
Photo below:

Middle school students compete in the black-market barter.



Photo above:

Students work as a team to solve this challenge.



The Auburn Mathematical Puzzle Challenge (AMP'd) is a one day, math and puzzle solving competition. For middle school AMP'd, teams of six to eight students compete to solve themed puzzles with the help of costumed guests. The middle school competition is run in partnership with the Mathematics department and most puzzles are created by graduate students. AMP'd offers a fun spin on a traditional math competition that students continue to enjoy each year. Middle School AMP'd culminates with a final puzzle that is solved by the top teams in front of a cheering crowd made up of their coaches and other teams. The 2019 competition had a detective and mystery theme.

DESTINATION STEM

Program Date:

Friday, September 20th

Number Impacted:

1,300

Participating Schools:

Admiral Moorer Middle School
Barbour County High School
Beulah Elementary
D.S. Smith Middle School
East Smiths Station
Five Points
Hayneville Middle School
Holtville Middle School
Loachapoka Elementary
Lowndes County Middle School
Millbrook Middle School
Opelika High School
Redland Elementary
Sanford Middle School
Smith's Station Jr. High School
Springwood School
Stanford Elmore High School
Talladega County Homeschool
Cooperative
Wacoochee Elementary
West Smiths Station Elementary

Destination STEM is a new take on AU Explore and serves as a full-day open house showcasing what the Auburn University College of Sciences and Mathematics has to offer. Schools send large groups of 6th - 10th graders to experience demos and have one-on-one interactions from various departments and groups from within the college. Destination STEM takes place in the Beard-Eaves-Memorial Coliseum and is one of the largest single day events that COSAM Outreach hosts. Auburn University faculty and staff within the Science, Engineering, and Math fields provide hands-on learning experiences and information highlighting their field of study.

Photo:

Students at Destination STEM talk to Dr. Minseo Park about how therein produces sound.



GREATER EAST ALABAMA SCIENCE AND ENGINEERING FAIR (GEARSEF)

Program Dates:

Wednesday, March 6th (Junior Division)
Thursday, March 7th (Senior Division)
Thursday, October 17th (Teacher Training)

Number Impacted:

250 (Junior Division)
150 (Senior Division)
25 (Teacher Training)

Participating Schools:

Admiral Moorer Middle School
Auburn High School
Auburn Junior High School
Beverlye Magnet School
Carroll High School
Carver Magnet School
Central High School
D.A. Smith Middle School
Drake Middle School
East Samford Junior High School
Eclectic Middle School
Elmore County High School
Eufaula High School
Geneva Middle School
Georgiana High School
Greenville High School
Greenville Middle School
Harrand Creek Elementary School
Hayneville Middle School
Holtville Elementary School
Honeysuckle Middle School
LAMP High School
Lowndes County Middle School
Marbury High School
McKenzie High School
Opelika Middle School
Phenix City Intermediate School
Redland Elementary School
Slocomb Middle School
Smiths Station High School
Smiths Station Junior High School
South Girard Middle School
Wacoochee Elementary School
Wetumpka High School
Wetumpka Middle School



Photo:

*Middle school GEARSEF students
celebrate their success.*

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. GEARSEF hosts 6th through 12th grade projects from Southeast Alabama counties. Students advance from both the Junior and Senior division to the state competition and Intel ISEF.

In addition, an annual teacher training session is hosted.

GETTING UNDER THE SURFACE (GUTS)

Program Date:

Tuesday, November 19th

Number Impacted:

80

Photo top:

Students explore the anatomical structures of a mammalian eye through a hands-on dissection.

Photo bottom:

Active learning about the amazing molecule, DNA, as participants extract DNA from cells.



The mission of GUTS is to enhance science literacy and engagement within our community by providing relevant science activities to students and their parents. GUTS is an evening program for first through sixth grade students and their parents or grandparents. Each evening session includes a 60-minute science activity featuring a “Getting Under the Surface” theme designed to demystify science topics.

The 2019 GUTS focused on genetics and anatomy. The first through third grade activity was called, “Genes in a Bottle” and involved learning about DNA. Participants had the opportunity to extract DNA from cells. The fourth through sixth grade activity was called, “Did EWE see that?” Students learned about vision and how we see by exploring the anatomical structures of a mammalian eye through a hands-on dissection.

REGIONAL SCIENCE OLYMPIAD

Program Date:
Saturday, April 13th

Number Impacted:
1,000

Participating Schools:

Auburn Classical Academy
Beulah Elementary School
Bryan Elementary School
Concord Elementary School
Excalibur Christian School
Fairhope Intermediate School
Gardendale Elementary School
Gresham Elementary School
Highlands Elementary School
Hueytown Elementary School
Montana Magnet School
Montgomery Catholic Preparatory School
Mountain Gap Elementary School
North Highland Elementary School
Ogletree Elementary School
Pick Elementary School
Prattville Christian Academy
St. Luke's Episcopal School
Thompson Intermediate School
Wrights Mill Road Elementary School
Yarbrough Elementary School

SCIENCE OLYMPIAD STUDENT'S
COLLABORATE



Each spring COSAM Outreach hosts a Science Olympiad Regional competition from elementary schools across the state. Elementary teams do not advance to another competition, but it allows local schools and students to prepare for Science Olympiad at the middle school and high school levels. This year, Auburn held 18 events covering topics such as anatomy, map reading, and weather. Auburn High School students designed and hosted several of the events at this year's regional competition. The competition was held at Auburn Junior High School.

SCIENCE MATTERS

Program Dates:

June 3-7
June 17-21
June 24-28
July 8-12
July 15-19
July 22-27

Number Impacted:

481

Participating Schools:

Auburn Classical Academy
Auburn Early Education Center
Auburn Junior High School
Beauregard Elementary School
Bob Harding Shawmut Elementary School
Briarwood Christian School
Brookstone School
Cary Woods Elementary School
Christian Family Montessori
Creekside Elementary School
Dean Road Elementary School
Discovery Christian School
Drake Middle School
East Samford School
Eclectic Elementary School
Freeman's Mill Elementary School
Homeschool
Lee-Scott Academy
Level Creek Elementary
Minnie Mars Jamieson Elementary
Mt. Laurel Elementary School
North Gwinnett Middle School
Northside Elementary School
Ogletree Elementary School
Opelika Middle School
Pear Creek Elementary
Pick Elementary School
Pike Road Elementary School
Pike Road Middle School
Richland Elementary School
Smiths Station Junior High School
Southview Primary School
St. James School
Stephens Elementary School
Twin Rivers Middle School
West Smiths Station Elementary School
Wrights Mill Road Elementary School
Yarbrough Elementary School

Science Matters is a summer enrichment program for rising 1st through 8th graders offering a supercharged science experience. The program allows participants to explore the world of science through real experiments, technology, art projects, and hands-on, make-n-take activities. During this action-packed program, kids can design and build, dabble in the art of chemistry, become a flight specialist, see amazing critters, and more. In 2019, COSAM Outreach and SCORE combined to host 28 unique camps over seven weeks with topics ranging from sound waves and things with wings to coding and robotics.

STEM STUDENTS
INQUIRE



THE SOUTH'S BEST REGIONAL ROBOTICS CHAMPIONSHIP

Program Dates:

Friday, December 6th

Saturday, December 7th

Sunday, December 8th

Number Impacted:

Approximately 4,000

Schools Impacted (each of the following hubs sends 2-6 teams/schools):

Bevill BEST (Fayette, AL)

East Alabama BEST (Gadsden, AL)

Emerald Coast BEST (Pensacola, FL)

Georgia BEST (Marietta, GA)

Northeast Alabama Best (Rainsville, GA)

Jubilee BEST (Mobile, AL)

Mississippi BEST (Starkville, MS)

Montgomery BEST (Montgomery, AL)

Music City BEST (Nashville, TN)

North Alabama BEST (Hanceville, AL)

Northwest Alabama BEST (Muscle Shoals, AL)

River BEST (Thomasville, AL)

Selma BEST (Selma, AL)

Shelton State BEST (Tuscaloosa, AL)

Tennessee Valley BEST (Decatur, AL)

Troy University BEST (Troy, AL)

Wiregrass BEST (Dothan, AL)

AT SOUTH'S BEST WE
ENERGIZE



BEST stands for Boosting Engineering Science and Technology and is a national non-profit program with 50 local competition sites (“hubs”) in 18 states. BEST inspires students to pursue careers in STEM through participation in a competitive robotics program that fosters knowledge, teamwork, and communication. The game is based on a real-world science and engineering challenge that provides students with an authentic problem-solving experience. The 2019 game theme was “Off The Grid” and challenged students to employ robots to repair the electric grid following a catastrophe. The South’s BEST Regional Championship at Auburn University is the final competition for 60 top teams from 16 BEST hubs across the southeast. This is the 17th year COSAM Outreach has hosted this event.

SPRING INTO SCIENCE

Program Date:

Tuesday, March 26th

Number Impacted:

150

"All students need challenge and hard fun that inspires them to dig deeper and construct big ideas. Making science hands-on and interesting is not pandering to young sensibilities; it honors the learning drive and spirit that is all too often crushed by endless worksheets and vocabulary drills."
-From, "How the Maker Movement is transforming education"

SPRING INTO FUN

Spring into Science is part of the Junior Mad Scientist outreach series hosted by the Graduate Women in Science (GWIS) student group and COSAM Outreach. Spring into Science is a free, open house style event for children in 1st through 5th grades. Children and their parent/guardian chaperone receive a passport to science when they enter and browse tables, participate in demonstrations, and complete make and take activities hosted by women from the Colleges of Agriculture, Engineering, and Sciences and Mathematics. Volunteers hosted 19 different science stations focused on biology, chemistry, and physics topics.



STATE SCIENCE OLYMPIAD

Program Date:

Saturday, March 30th (Science Olympiad)

Wednesday, August 14th (Director's Workshop)

Number Impacted:

600 (State Science Olympiad)

18 (Tournament Director's Workshop)

Participating Schools:

Alabama School of Fine Arts

Alabama School of Mathematics and Science

Auburn High School

Auburn Junior High School

Baldwin Arts and Academics Magnet School

Brewton Middle School

Christ the King Catholic School

Discovery Middle School

Drake Middle School

East Samford School

Excalibur Christian School

Gardendale High School

Hewitt Trussville High School

Hoover High School

Jefferson County IB School

Liberty Middle School

LAMP High School

Montgomery Catholic Preparatory School

Our Lady of the Valley Catholic School

Prattville Christian Academy

Randolph School

Sparkman High School

St. John Paul II Catholic High School

Trinity Presbyterian School

Vestavia Hills High School

Virgil I Grissom High School

In addition to an elementary Regional Science Olympiad, Auburn also hosts the Science Olympiad State Competition for middle school and high school teams. Teams advance from four other regional competitions from around Alabama and then compete in 23 different events on topics such as criminology, game programming, and fossils. Auburn then sends one team from both the middle school and high school competition to the National Science Olympiad Competition. This year, Alabama advanced Auburn High School and Auburn Junior High School to compete at Nationals in Ithaca, NY.

A one-day workshop for all regional tournament directors and staff in Alabama was also held.



SUMMER SCIENCE INSTITUTE

Program Date:

Sunday, June 9th -
Saturday, June 15th

Number Impacted:

16

Participating Schools:

Athens Academy

Carbon Hill High School

East Coweta High School, GA

Etowah High School

Forsyth Central High School, GA

Jefferson County IB School

LAMP High School

McGill-Toolen Catholic High School

Montgomery Catholic Preparatory School

Northgate High School, GA

Smiths Station High School



Photo top right:

Students engaged in a chemistry lab.

Photo bottom right:

Students at SSI enjoy a hands-on science experiment.



The Summer Science Institute at Auburn University is a summer science program for rising 11th and 12th grade students with a high aptitude and interest in the fields of science and mathematics. The program, supported by the College of Sciences and Mathematics at Auburn University, partners students with experienced research faculty to explore topics more advanced than what is typically taught in a public or private high school environment. Students are selected through an extensive application process and then are invited to spend a week on Auburn's campus learning about what COSAM and Auburn have to offer while getting a glimpse of what college will be like, dorms included.

VEX ROBOTICS STATE TOURNAMENT

Program Date:

Friday, March 1st

Saturday, March 2nd

Sunday, March 3rd

Number Impacted:

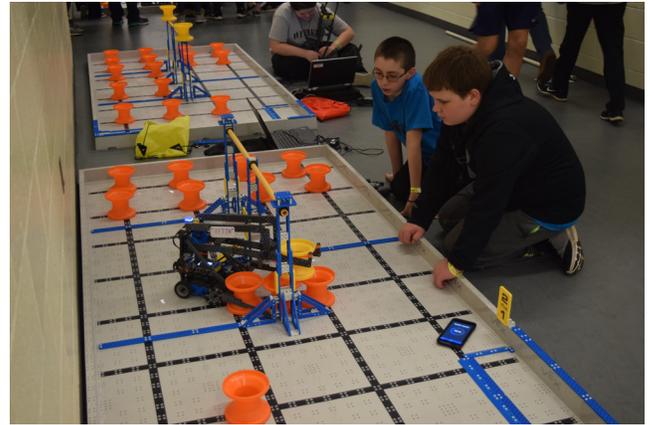
1,800

Participating Schools:

60 Middle School and High School Teams
- VEX Robotics Challenge

56 Elementary School Teams - VEX IQ

43 Middle School Teams - VEX IQ



For the first time ever the city of Auburn hosted the VEX Robotics State Tournament. Sixty middle school and high school teams competed in the VEX Robotics Challenge and 56 elementary school teams and 43 middle school teams competed in the VEX IQ Challenge.

The VEX IQ Challenge provides elementary and middle school students with exciting, open-ended robotics and research project challenges to enhance their science, technology, engineering, and mathematics (STEM) skills through hands-on, student-centered learning. Each year in the VEX Robotics Competition, an exciting engineering challenge is presented in the form of a game. Students, with guidance from their teachers and mentors, build innovative robots and compete year-round.



ADDITIONAL PROGRAMS SUPPORTED



AP INSTITUTE

Program Date:
July 8th - 11th

Number Impacted:
75

Summary:

Teacher training in advanced placement materials. Topics included biology, chemistry, calculus, and computer science principles.

COLLEGE QUEST ACADEMY STEM DISCOVERY DAY

Program Date:
Thursday, June 27th

Number Impacted:
16

Participating Schools:
Alabama Institute for Blind and Deaf

Summary:

The College Quest Academy is a partnership with the Alabama Department of Rehabilitation Services Blind and Low-Vision Services and Auburn University. The

College of Sciences and Mathematics Outreach department hosted STEM Discovery Day. Sixteen juniors and seniors engaged in biology morning sessions and afternoon chemistry sessions full of hands on activities and laboratory demonstrations.





AUBURN

UNIVERSITY

COSAM OUTREACH

315 Roosevelt
Concourse
131 Sciences Center
Classroom Building
Auburn, AL 36849

Phone:
334.844.5745

Email:
ewaldml@auburn.edu

Website:
[http://www.
auburn.edu/cosam/
departments/outreach/](http://www.auburn.edu/cosam/departments/outreach/)