Program: Science Investigations

Description: A meaningful science lab experience for home-schooled students which culminates in a Science and Engineering Fair Research Project.

Date: Friday, January 13th and 20th; 9:00 AM - 11:00 AM

Facilities: SCL 231

Personnel:

AU: Erin Percival, Mary Lou Ewald, Sallie Martin, Allison Tjelmeland, Chelsea Harrison

Student Impact:

Number of Students: 40
Grade Range: 6th - 8th
Schools Served: NA

Class Information:

Instructed by:

- Erin Percival
- Sallie Martin

Activities:

This two-part lesson introduced students to biology lab skills and basic research skills.

Specific topics included:

- The scientific naming process
- How to use a dichotomous key
- Dissecting microscope technique
- Measuring lab
- Graphing Skills
Program: Getting Under the Surface (GUTS)

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

Date: Thursday, January 26th; 6:00 PM - 8:00 PM

Facilities: Parker Hall, SCC 115, SCL 231, SCL 310

Personnel:

AU: Mary Lou Ewald, Erin Percival, Molly McCartney, Molly Folkerts
Non-AU: Rebecca Balkcom (Auburn Junior High School), Wayne Strickland (AMSTI)

Student Impact:

Number of Students: 16
Grade Range: 1st - 6th
Schools Served: NA

Course: Making Music

Have you ever composed music at the dinner table using your mom’s water glasses? It probably didn’t make her very happy, but if you have, you will be well practiced for one of our challenges! This all-new course will allow you to explore the science of sound through a series of hands-on learning stations. Kids and parents will learn about the science of sound, and will even have the chance to make an instrument of their own!

Grades: 1 - 3

Developed by: Rebecca Balkcom & Erin Percival
Number of Students: 7 (5 reporting on survey)
Average Student Satisfaction: 5 (out of 5)
Average Parent Satisfaction: 5 (out of 5)

Course: Engineering Magic

Have you ever been mystified by a magic trick? Stumped by an unbelievable magician? Put on your thinking caps and sharpen your observation skills as you watch increasingly complex magic tricks and develop your own explanations! A good magician never reveals his secrets, but I am not a good magician, so afterwards you will see the ‘tricks’ of the trade!

Grade Range: 4 - 6

Developed by: Wayne Strickland
Number of Students: 9 (6 reporting on survey)
Student Satisfaction: 5 (out of 5)
Parent Satisfaction: 5 (out of 5)
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, February 4th; 9:00 AM - 4:00 PM

Facilities: Parker Hall, SCA, SCC 115, SCC 118, SCC 122, SCL 231

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Allison Tjelmeland, Chelsea Harrison, Tj Nguyen, Braxton Carrigan, Steven Clontz, Bryan McMeen

Math Dept.: Mary Claire Thompson, John Asplund, PJ Couch, James Hammer, David Pritchard, Chris Krizan, Jessica Godwin, Rachel Watson, Michael McMeen, Sally Thompson, Jamie Willoughby, Megan Reynolds, Amanda Chu, Abby Noble, Haley Stegar, Holly Steger, Kristin Courtney, Corinna Hinkson, Matthew Echeverria, Daniel Brice, Joseph Chaffee, Scott Varagona, Alan Bertl, Jennifer Aust, Maegan Neufeldt, Brandon Baker, Yesenia Perez

Student Impact:

Number of Students: 46
Grade Range: 7th-8th
Schools Served:

• Auburn Junior High School
• Opelika Middle School (2 teams)
• Russell County Middle School
• Sanford Middle School
• Southside Middle School (2 teams)

If you could change one thing about AMP’d what would it be and why?

“I would make it longer and with more puzzles.”

“I would make it in the 9th and 10th grade too.”

“I wouldn’t change anything because it’s perfect”

“I really wouldn’t change anything it was an awesome experience! ;)”

“I would make it for grades up to 9th grade”

“Nothing it was fabulous, I would love to come back anytime!”

“I wouldn’t change anything. It was awesome.”

“I would change the fact that it ended and there was only one day for it. It was fun.”

From the AMP’d Student Survey
As a result of participating in AMP'd, my students ability to problem solve

- 14% Did Not Increase
- Somewhat Increased
- Greatly Increased

86%

Rank your enjoyment of AMP'd Challenge

- 4% Very Enjoyable
- Somewhat Enjoyable
- Somewhat not enjoyable
- Not enjoyable

96%

Participants (by gender)

- 46% Males
- 54% Females

Results from 2012 AMP'd Student Survey
Program: **Science Investigations**

Description: A meaningful science lab experience for home-schooled students which culminates in a Science and Engineering Fair Research Project.

Date: Friday, February 10th and 17th; 9:00 AM - 11:00 AM

Facilities: SCL 231

Personnel:

AU: Erin Percival, Mary Lou Ewald, Allison Tjelmeland, Chelsea Harrison

Student Impact:

- Number of Students: 40
- Grade Range: 6th - 8th
- Schools Served: NA

Class Information:
Instructed by:

- Erin Percival

Activities:

This lesson built student’s microscope technique and allowed students use the measurement and graphing skills they acquired at the end of the last lesson. Specific activities included:

- Calculating the heart rate for *Daphnia sp.*
- Viewing microbes on a compound microscope
- Viewing microbes on a dissecting scope
- Calculating the effect of caffeine on *Daphnia sp.*
- Creating a graph to represent data
**Program:** Getting Under the Surface (GUTS)

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

**Date:** Monday, February 13th; 6:00 PM - 8:00 PM

**Facilities:** SCC 115, SCL 102, SCL 231, SCL 310

**Personnel:**

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Molly Folkerts, Sallie Martin, Dr. Elizabeth Lipke

Non-AU: Karin Fuller (Auburn Junior High School)

**Student Impact:**

Number of Students: 21

Grade Range: 1st - 6th

Schools Served: NA

**Course:** Potato Picasso

Before crayons were sold in boxes of 120, what products were used for coloring? Fruits and veggies make an excellent pallet of colors for creating beautiful, creative works of art. Join me, as we experiment with a variety of natural coloring tools; create our own artwork, and learn plant science along the way!

Grades: 1 - 3

Developed by: Karin Fuller

Number of Students: 11 (8 reporting on survey)

Average Student Satisfaction: 4.75 (out of 5)

Average Parent Satisfaction: 4 (out of 5)

**Course:** Your Healthy Heart

Beating over 100,000 times per day for decades, you heart never gets a break! Come learn how your heart works to keep your body supplied with oxygen, what you can do to help it stay healthy, and how heart repair may someday be possible.

Grade Range: 4 - 6

Developed by: Dr. Elizabeth Lipke

Number of Students: 10 (5 reporting on survey)

Student Satisfaction: 4.8 (out of 5)

Parent Satisfaction: 4.6 (out of 5)
Program: Tests of Engineering Aptitude, Mathematics and Science (TEAMS)

Description: Students work collaboratively in teams of 4-8 students to solve real-world engineering challenges, applying their math and science skills in practical, creative ways in this annual competition.

Date: Friday, February 24th; 1:00 PM - 4:00 PM

Facilities: Student Center Ballroom

Personnel:

AU: Mary Lou Ewald, Erin Percival, George Blanks, Chelsea Harrison, Molly McCartney

Student Impact:

Number of Students: 64

Grade Range: 9th - 12th

Schools Served:

• Virgil I. Grissom High School
• Montgomery Catholic High School
• The Randolph School
• Hanceville High School
• Columbus High School
• Central Educational Center
Program: Middle School Science Olympiad (Division B)

Description: An annual one-day sports-like science competition for students in grades 6 - 9.

Date: Saturday, February 25th; 7:30 AM - 4:00 PM

Facilities: Student Center Ballroom, Parker Hall, SCC, SCL, Rouse Life Sciences, Haley Center, Petri Hall

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Lara Stubbs, Allison Tjelemland, Molly McCartney, additional AU Personnel listed below

Student Impact:

Number of Students: 270

Grade Range: 6th - 9th

Schools Served:
- Auburn Junior High School
- Baldwin Arts & Sciences Academy
- Beverlye Magnet School
- Carver Magnet School
- The Corner School
- Fultondale High School
- Geneva Middle School
- J.F. Drake Middle School
- Montgomery Catholic Preparatory School
- St. James School
- The Altamont School

Event Supervisors:

Dr. Ming-Kuo Lee  Awesome Aquifer
Dr. Xiaoying Han   Compute This
Kyle & Nathan Paris  Forestry
Dr. Molli Newman  Disease Detectives
Dr. Brian Helms  Water Quality
Dr. Tom Webb  Experimental Design
Dr. Mark Liles  Microbe Mission
Dr. Peter Nylen  Bottle Rocket
Dr. Chris Sundermann  Anatomy
Dr. Bob Lishak  Write It Do It
Dr. Ashraf Uddin  Dynamic Planet
Dr. Dmitry Glotov  Towers
Dr. Huajun Huang  Mouse Trap Vehicles
Dr. Luke Marzen  Road Scholars
Dr. John Hawkins  Rocks & Minerals
Dr. Erkan Nane  Storm the Castle
Dr. Virginia Davis  Science Crime Busters
Daniel Smith  Food Science
Dr. Minseo Park  Optics
Dr. David Maurer  Keep the Heat
Dr. Mike Fogle  Meteorology
Dr. Stuart Loch  Mission Possible
Dr. Bill Maddox  Reach For the Stars
Program: Spring Youth Experiences in Science (YES)

Description: Children engage in hands-on, make-and-take activities related to specific fields of science and math in a half-day academy.

Date: Saturday, March 3rd; 8:00 AM - 12:00 PM

Facilities: SCA, Parker 112, Parker 122, SCL 231, SCL 310

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Molly Folkerts, Chelsea Harrison, Allison Tjelemelnd, Emily Dunavant, and Andrew Henley

Non-AU: Amy Rutherford (J.F. Drake Middle School), Gina Watkiss (The Heritage School)

Student Impact:

Number of Students: 101
Grade Range: 3rd - 5th

- Course: SCATS!
  Developed by: Gina Watkiss
- Course: Stop, Draw, Think!
  Developed by: Andrew Henley
- Course: Density Detectives
  Developed by: Amy Rutherford
- Course: Swingin’ from the Vines
  Developed by: Emily Dunavant
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: Wednesday, March 7th; 8:00 AM - 3:00 PM

Facilities: Student Center Ballroom, SC 2216, SC 2218, SC2222, SC 2223, SC2225

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, George Blanks, Sallie Martin, Allison Tjelmeland, Molly Folkerts, and Molly McCartney, additional AU Personnel listed below

Non-AU: Smita Mohanty, Tom Powell, Chelsea Ward (AUM), Ty Lucy (AMSTI), Wayne Strickland (AMSTI)

Student Impact:

Number of Students: 130
Grade Range: 6th - 12th

Schools Served:
- Auburn High School
- Autaugaville School
- Central High School
- Elmore County High School
- Glenwood School
- Hayneville Middle School
- Redland Elementary School
- Science Investigations Homeschool
- Stanhope Elmore High School
- The Calhoun School
- Wetumpka Middle School

AU Faculty and Grad. Students:

COSAM
- Caley Allen
- Nanette Chadwick
- Roland Dute
- Shobnom Ferdous
- Maggie Han
- Hayaa Hasemi
- Shawn Jacobsen
- Eli Kosnicki
- Allen Landers
- Dana Lashley
- Billy McCann
- Stephen Sefick
- Daniel Smith
- Chris Sundermann

Engineering
- Judith Bailey
- Swathi Bathula
- Sree Vishal Chapalamadugu
- Devin Cook
- Virginia Davis
- Yang Liu
- Bill Josephson
- Golbahar Mirhossenini
- Hema Ramsurn
- Jonathan Ryan
- Vaishali Sharda
- Martina Svyantek

Other

Kayla Cole (College of Education)
Yewande Fasina (College of Education)
Molli Newman (College of Agriculture)
Amirreza Sharifi (School of Forestry)
Program: Getting Under the Surface (GUTS)

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

Date: Tuesday, March 20th; 6:00 PM - 8:00 PM

Facilities: Parker Hall, SCC 115, SCL 231, SCL 310

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Molly McCartney, Jason Bond, Sallie Martin

Non-AU: Gina Watkiss (The Heritage School)

Student Impact:

Number of Students: 17
Grade Range: 1st - 6th
Schools Served: NA

Course: Spring Fling

Spring is a great time of year; flowers are beginning to bloom, the beach is on everyone’s minds and Easter is on its way. Kick-off this spring with a collection of spring-themed chemistry and physics experiments. Use bubbles to discover how spring rainbows are formed, create your own eggs and explore the properties of sand, shells, and suntan lotion in this spring-themed course!

Grades: 1 - 3
Developed by: Gina Watkiss

Number of Students: 8 (5 reporting on survey)
Average Student Satisfaction: 5 (out of 5)
Average Parent Satisfaction: 5 (out of 5)

Course: Along Came a Spider

Did you know that you are rarely ever more than six feet away from a spider and that spider silk is one of the strongest natural fibers known? And, with over 40,000 species, spiders are among the most abundant predators on the planet! Come discover spiders and learn how they benefit humans, how they make and use silk, how spider venom aids them, and how to recognize spiders common to your backyard. Put your fears aside as we explore this important, remarkable, and diverse group of animals.

Grade Range: 4 - 6
Developed by: Dr. Jason Bond

Number of Students: 9 (5 reporting on survey)
Student Satisfaction: 5 (out of 5)
Parent Satisfaction: 4.8 (out of 5)
Program: Getting Under the Surface (GUTS)

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

Date: Wednesday, April 11th; 6:00 PM - 8:00 PM

Facilities: Parker Hall, SCC 115, SCL 231, Parker 112

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Molly Folkerts, Allison Tjelme-land, Paul Norgaard

Non-AU: Rebecca Balkcom (Auburn Junior High School)

Student Impact:

Number of Students: 15
Grade Range: 1st - 6th
Schools Served: NA

Course: Butterflies in my Window

Come learn how butterflies complete their life cycle as they grow and change from an egg into a beautiful butterfly. You will discover how the anatomy of a butterfly allows the insect to endure its diverse life cycle, and even have the opportunity to build your own butterfly house! Then, at home, you can watch your egg, from your window as it hatches from its cocoon and transforms into a beautiful butterfly.

Grades: 1 - 3
Developed by: Rebecca Balkcom
Number of Students: 7 (2 reporting on survey)
Average Student Satisfaction: 5 (out of 5)
Average Parent Satisfaction: 5 (out of 5)

Course: Cheesy Chocolate Chemistry

Formerly “Edible Science,” this course will allow students to understand how science makes foods tasty! Come learn how to harness the forces of nature to make extraordinary edible delights like candy and hot chocolate. We’ll stimulate and excite your taste buds while using things like liquid nitrogen to make something “cool”. Bring your hunger for sweets and science!!

Grade Range: 4 - 6
Developed by: Dr. Paul Norgaard
Number of Students: 8 (7 reporting on survey)
Student Satisfaction: 5 (out of 5)
Parent Satisfaction: 4.7 (out of 5)
Program: Elementary School Science Olympiad (Division A2)

Description: An annual one-day sports-like science competition for students in grades 3 - 6.

Date: Saturday, April 25th; 7:30 AM - 4:00 PM

Facilities: Student Center Ballroom, Parker Hall, SCC, SCL

Personnel:

AU: Dr. Greg Harris, Mary Lou Ewald, Erin Percival, Kathy Feminella, Lara Stubbs, Allison Tjelemeland, Molly Folkerts, Chelsea Harrison, Molly McCartney, additional AU Personnel listed below

Non-AU: Science teachers from participating schools

Student Impact:

Number of Students: 515

Grade Range: 3rd - 6th

Schools Served:

- Brighton Elementary School
- Dean Road Elementary School
- Cary Woods Elementary School
- Excalibur Christian School
- Geneva Middle School
- Highlands Elementary School
- Hillview Elementary School
- Hueytown Elementary School
- Kelly Springs Elementary School
- W.O. Lance Elementary School
- Mt. Gap Elementary School

- James Mulkey Elementary School
- Ogletree Elementary School
- Richland Elementary School
- St. Luke’s Episcopal School
- Wright’s Mill Rd. Elementary School
- Yarbrough Elementary School
Program: AU Explore

Description: COSAM’s annual science and mathematics open house

Date: Thursday, April 26th; 8:00 AM - 3:00 PM

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

Personnel:

AU: Mary Lou Ewald, Kathy Feminella, Erin Percival, Allison Tjelmelanda, Lara Stubbs, Chelsea Harrison, Molly Folkerts, Molly McCartney, Kristy Mann, Wayne Strickland; additional AU personnel listed below

Student Impact:

Number of Students: 1132
Grade Range: 5th - 8th

Schools Served:

- Bay Minette Middle School
- Chambers Academy
- Dean Road Elementary School
- Dozier Elementary School
- J.F. Drake Middle School
- Eagle Ranch
- Meadowland Elementary School
- Northside Intermediate School
- Ogletree Elementary School
- Smiths Station Junior High School
- South Girard School
- St. Paul’s Episcopal School
- Veritas Christian Academy
- Victory Baptist School
- Victory Christian School
- Wacoochee Elementary School
- Wright’s Mill Rd. Elementary School
- Yarbrough Elementary School
- 127 homeschool students

Science EXPO: The Science EXPO is a series of dozens of interactive displays sponsored by each of the 4 science departments that comprise the College of Sciences and Mathematics (COSAM) at Auburn - Physics, Biological Sciences, Chemistry & Biochemistry, and Geography & Geology. Students browse the displays at their own pace and were able to see, touch, hear, and smell the many wonders of science! Included in the Science EXPO are live animal displays, featuring snakes, lizards, turtles, spiders, insects, and many more fascinating creatures!

- Jon Armbruster and graduate students
- Jason Bond
- Nanette Chadwick and graduate students
- Debbie Folkerts
- Ken Halaynch and graduate students
- Shawn Jacobsen
- Steven Jaret
- Donna Raiford
- Aaron Rashotte and graduate students
- Scott Santos and graduate students
- Chris Goldsmith
- Susanne Striegler and graduate students
- John Simms and graduate students
- Allen Landers and graduate students
- Ed Thomas 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
  2, 45 minute courses
  Number of students: 52

- **Build a Kaleidoscope**
  Instructed by: Erica Snipes
  3, 45 minute courses
  Number of students: 62

- **Build a Motor**
  Instructed by: Jonathan McFadden
  3, 45 minute courses
  Number of students: 68

- **Carnivorous Plants**
  Instructed by: Dee Smith
  2, 45 minute courses
  Number of students: 55

- **Cartesian Diver**
  Instructed by: Dave Patrick
  3, 45 minute courses
  Number of students: 105

- **Fly Over Alabama**
  Instructed by: Chandana Mitra
  2, 45 minute courses
  Number of students: 69

- **Fur, Feathers, and Fins**
  Instructed by: Matt Kearly
  2, 45 minute courses
  Number of students: 49

- **Genes in a Bottle**
  Instructed by: Mark Liles
  2, 45 minute courses
  Number of students: 51

- **Hoo Eats Who?**
  Instructed by: Chris Sundermann, Roland Dute
  2, 45 minute courses
  Number of students: 47

- **iSpy Mathematics**
  Instructed by: Kristy Mann
  2, 45 minute courses
  Number of students: 75

- **Medical Technology**
  Instructed by: Kat Milly West
  3, 45 minute courses
  Number of students: 140

- **Physics of Music and Atoms**
  Instructed by: Stuart Loch
  3, 45 minute courses
  Number of students: 178

- **Science Magic**
  Instructed by: Wayne Strickland
  3, 45 minute courses
  Number of students: 88

- **Silly Cilia**
  Instructed by: Tony Moss
  2, 45 minute courses
  Number of students: 48

- **Snap Electronics**
  Instructed by: Rebecca Rogers, Josh Vanderhyden
  2, 45 minute courses
  Number of students: 48

- **Survivor**
  Instructed by: Brian Helms and Molli Newman
  3, 45 minute courses
  Number of students: 71

- **We-Do LEGOS**
  Instructed by: Corey Small
  2, 60 minute courses
  Number of students: 48
Demo Shows: Demo shows are large-scale science shows.

- **Raptor Show**
  Instructed by: Southeastern Raptor Center
  2, 45 minute shows
  Number of students: 450

- **Glass Blowing Show**
  Instructed by: Wendall Sandlin & Matt Montgomery
  4, 45 minute shows
  Number of students: 362

- **Herpetology Show**
  Instructed by: Michael Wines
  2, 45 minute courses
  Number of students: 377

Math EXPO: The Math EXPO is a tent chock full of interactive math learning activities targeted at the 5th - 8th grade ability level.

  Developed by: Braxton Carrigan
  3, 45 minute sessions
  Number of students: 197

**Participation by Department**

**Biology:**
- Jon Armbruster (Science EXPO)
- Jason Bond (Science EXPO)
- Nanette Chadwick (Science EXPO)
- Roland Dute (Science Fun Shop)
- Debbie Folkerts (Science EXPO)
- Ken Halanych (Science EXPO)
- Brian Helms (Science Fun Shop)
- Shawn Jacobsen (Science EXPO)
- Matt Kearly (Science Fun Shop)
- Mark Liles (Science Fun Shop)
- Bob Lishak (Science Fun Shop)
- Tony Moss (Science Fun Shop)
- Mollie Newman (Science Fun Shop)
- Donna Raiford (Science EXPO)
- Aaron Rashotte (Science EXPO)
- Scott Santos (Science EXPO)
- Dee Smith (Science Fun Shop)
- Chris Sundermann (Science Fun Shop)
- Mike Wines (Demo Show)

**Chemistry/Biochemistry:**
- Chris Goldsmith (Science EXPO)
- Matt Montgomery (Demo Show)
- Wendall Sandlin (Demo Show)
- Susanne Striegler (Science EXPO)
- Kat Milly West (Science Fun Shop)

**Geology and Geography:**
- Steven Jaret (Science EXPO)
- Luke Marzen (Science Fun Shop)
- Chandana Mitra (Science Fun Shop)
- John Simms (Science EXPO)

**Mathematics and Statistics:**
- Braxton Carrigan (Math EXPO)

**Physics:**
- Allen Landers (Science EXPO)
- Stuart Loch (Science Fun Shop)
- Jonathan McFadden (Science Fun Shop)
- Dave Patrick (Science Fun Shop)
- Rebecca Rogers (Science Fun Shop)
- Cory Small (Science Fun Shop)
- Erica Snipes (Science Fun Shop)
- Ed Thomas (Science EXPO)
- Josh Vanderhyden (Science Fun Shop)

**AMSTI:**
- Kristi Mann (Science Fun Shop)
- Wayne Strickland (Science Fun Shop)
Program: SWSM 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, and luncheon.

Date: Tuesday, May 1st; 8:00 AM - 1:30 PM

Facilities: Student Center

Personnel:

AU: Mary Lou Ewald, Erin Percival, Tammy Hartwell, Brook Moates, Kim McCurdy, Lara Stubbs, Molly Folkerts, Molly McCartney, Emily Dunavant

Student Impact:

Number of Students: 70
Grade Range: 9th - 12th
Schools Served: NA

Panelists and their Break-Out Sessions:

Caley Allen
Dept. of Chemistry and Biochemistry
PhD candidate
Chemistry without Chemicals

MiShawna Carlisle
Harrison School of Pharmacy
Student

Alexis Janosik
Dept. of Biological Sciences
PhD Candidate
My Antarctic Journey

Break-Out Sessions:

Dr. Beth Yarbrough
Director of COSAM Student Services
Majoring in Science and Mathematics at Auburn University

Erin Percival
Assistant Director of COSAM Outreach
More than just grades: Becoming a well-rounded college applicant

Beverley Childress
COSAM Pre-health Director
Preparing to become a doctor, veterinarian, or other health professional
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:
- Monday, June 4 - Friday, June 8; 8:00 AM - 5:00 PM
- Monday, June 18 - Friday, June 22; 8:00 AM - 5:00 PM
- Monday, June 25 - Friday, June 29; 8:00 AM - 5:00 PM
- Monday, July 9 - Friday, July 13; 8:00 AM - 5:00 PM
- Monday, July 16 - Friday, July 20; 8:00 AM - 5:00 PM
- Monday, June 30 - Friday, August 3; 8:00 AM - 5:00 PM

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

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Kristen Bond, Emily Dunavant, Lara Stubbs, Tj Nguyen, Allison Tjelmeland, Chelsea McMeen, Molly Folkerts, Molly McCartney, Allison H., Savannah Roberts

Non-AU: Rebecca Balkcom (Auburn Junior High School), Mark Jones (J.F. Drake Middle School), Frank Ware (Retired, Sanford Middle School), Gina Watkiss (The Heritage School), Hilary Boyd (Auburn Junior High School), Courtney Davis (Pleasant Valley Elementary School), Lana Grooms (Auburn Early Education Center), Karin Fuller (Auburn Junior High School), Andrew Click (Sanford Middle School), Amanda Prince (Auburn Early Education Center), Leah Shope (Auburn Early Education Center), Amy Rutherford (J.F. Drake Middle School)

Student Impact:

Number of Students: 204

Student Seats Filled: 394/420 (94% capacity)

Grade Range: rising 1st - 6th

Schools Served: Ada B. Cheston Elementary, Beauregard Elementary, Beulah Elementary, Cary Woods Elementary, Casis Elementary, Christ the King Catholic School, DA Smith Middle School, Daniel Pratt Elementary, Dean Road Elementary, Double Churches, Eastside Elementary, Evensdale, Forest Avenue Magnet School, Halcyon Elementary, Immaculate Heart of Mary Catholic School, Ivy Creek Elementary, J.F. Drake Middle School, Jeter Primary, Lee-Scott Academy, Meadowview Elementary, The Montessori School, Morris Avenue Intermediate, Mot Charter School, Northern Middle School, Northside Intermediate, Oak Grove Elementary, Ogletree Elementary, Opelika Middle School, Pates Creek Elementary, Reeltown, Richland Elementary School, Springwood School, St. Bede, The Donoho School, Thompson Intermediate, Trinity Christian School, Westhill Institute, Wright’s Mill Road Elementary, Yarbrough Elementary
Course Information:

**Week #1: June 4 - 8, 2013**

*Penguins and Polar Bears*
- Instructor: Courtney Davis
- Grades: 1 - 2
- Number of Students: 22

*NASA Design Squad*
- Instructor: Mark Jones
- Grades: 3 - 4
- Number of Students: 24

**Week #2: June 18 - 22, 2013**

*Calling All Artists!*
- Instructor: Lana Grooms
- Grades: 1 - 2
- Number of Students: 22

*Slimy Science 2*
- Instructor: Gina Watkiss
- Grades: 3 - 4
- Number of Students: 24

*Creepy Crawler Olympics*
- Instructor: Rebecca Balkcom
- Grades: 3 - 4
- Number of Students: 24

**Week #3: June 25 - 29, 2013**

*Can I Dig to China?*
- Instructor: Amanda Prince
- Grades: 1 - 2
- Number of Students: 22

*Gettin’ Froggy With It*
- Instructor: Karin Fuller
- Grades: 3 - 4
- Number of Students: 24

*The Electric Pickle*
- Instructor: Frank Ware
- Grades: 5 - 6
- Number of Students: 24

**Week #4: July 9 - 13, 2013**

*Growing a Pizza!*
- Instructor: Lana Grooms
- Grades: 1 - 2
- Number of Students: 21

*Rocket Science*
- Instructor: Mark Jones
- Grades: 3 - 4
- Number of Students: 24

*Adventure Park Adventure*
- Instructor: Frank Ware
- Grades: 5 - 6
- Number of Students: 24

**Week #5: July 16 - 20, 2013**

*Light and Sight*
- Instructor: Amanda Prince
- Grades: 1 - 2
- Number of Students: 22

*We Got The Beat*
- Instructor: Rebecca Balkcom
- Grades: 3 - 4
- Number of Students: 20

*Snap It!*
- Instructor: Hilary Boyd
- Grades: 3 - 4
- Number of Students: 17

**Week #6: July 30 - August 3, 2013**

*Rockin’ and Rollin’ All About Motion*
- Instructor: Leah Shope
- Grades: 1 - 2
- Number of Students: 22

*Race to the Sun*
- Instructor: Amy Rutherford
- Grades: 3 - 4
- Number of Students: 25

*Measuring: From Microbes to Mountains*
- Instructor: Frank Ware
- Grades: 5 - 6
- Number of Students: 12
Program: Summer Science Institute

Description: An all-new summer science program for outstanding 11th-12th grade students interested in science and mathematics. Students engage in real-world applications of science, perform experiments using cutting edge research equipment, and partner with COSAM researchers to gain lab skills not taught in high school.

Date: Monday, June 10 - Friday, June 16; 8:00 AM - 5:00 PM

Facilities: SCC, SCL, Chemistry Building, Petrie Hall, Parker Hall, Rouse Life Sciences Building, Leach Science Center

Personnel:

AU:

Counselors: Paul Bergen, Patrick Donnan, Emily Dunavant, Daniel Smith, Allison Tjelmeland

Lead Faculty: Jason Bond, Mike Fogle, Debbie Folkerts, Anne Gorden, John Gorden, Bill Hames, Allen Landers, Mark Liles, Chris Rodger

Additional AU Faculty/staff: Roger Birkhead, Rik Blumenthal, Mary Lou Ewald, Kathy Feminella, Dean Hoffman, Marianne Hudson, Shawn Jacobsen, Dave Maurer, Erin Percival, Chelsea McMeen, Mike Miller, Chris Murray, Jim Saunders, Lara Stubbs, Chris Sundermann, Ashraf Uddin, Paul West, Lorraine Wolf

Student Impact:

Number of Students: 26

Grade Range: rising 11th - 12th

Schools Served: NA

Survey Results

<table>
<thead>
<tr>
<th>After participating in AU-SSI my understanding of how to engage in scientific research has...</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Greatly decreased</td>
</tr>
<tr>
<td>☐ Decreased</td>
</tr>
<tr>
<td>☐ Not changed</td>
</tr>
<tr>
<td>☐ Increased</td>
</tr>
<tr>
<td>☐ Greatly increased</td>
</tr>
</tbody>
</table>
Program: War Eagle BEST Teacher Training Workshop

Description: Professional development for BEST Robotics teachers that included both technical and non-technical/BEST Award training.

Date: Monday, August 6th - Tuesday, August 7th; 8:30 AM - 4:00 PM

Facilities: SCC 115, SCC 118

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Molly McCartney, George Blanks, Jackie Hundley, Tj Nguyen, Curtis Shannon, Virginia Davis

Student Impact:

Schools Served:
- Benjamin Russell High School
- Brewbaker Technology Magnet High School
- Glenwood School
- Loachapoka High School
- Montgomery Catholic Preparatory School
- Opelika Middle School
- Prattville High School
- St. James School
- Smiths Station High School
- Southside Middle School
- The Heritage School
- Wetumpka High School
- Wetumpka Middle School

Course: The Technical Side of BEST

Learn the ins and outs of the technical side of BEST. Teachers will explore the purpose and correct usage of each Returnables Kit item and get experience with the building process as they construct their own VEX Robot using a rapid prototyping kit. Finally, teachers will learn how to effectively program their newly constructed robots using the Intelitek EasyC programming environment.

Developed by: Tj Nguyen, Dr. Jackie Hundley

Number of Participants: 13

Teachers without prior training: 10

Course: BEST Success

Teachers will get insider information on what it takes to be successful in the non-robotics portions of BEST. They will learn how to construct a professional quality engineering notebook, learn what judges are looking for at their team exhibits and what sets apart a memorable marketing presentation from one that gets lost in the shuffle.

Developed by: Mary Lou Ewald, Erin Percival

Number of Participants: 11

Teachers without prior training: 9
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 29th; 9:00 AM - 4:00 PM

Facilities: Parker Hall, SCA, SCC 115, SCC 118, SCC 122, SCL 231

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Allison Tjelmeland, Tj Nguyen, John Asplund, Steven Clontz

Math Dept.: Steven Clontz, John Asplund, Mary Claire Thompson, Jessica Godwin, James Hammer, Christopher Krizan, Katherine Perry, Andrew Owens, Kathy Wilson, Kelly Bragan, Wei Huang, kristin Courtney, Frank sturm, Katherine Moore, Megan Reynolds, Calvin Montgomery, Hairuo Xu, Alisa Chauhan, Muriel Holmqquist, Caleb Callais, Graham Gordon, Hudson Lafayette, Noel Cervantes, Felipe Shinsato, Garrett Hutchins, Joshua Perkins, Brandon Baker, Nolan Chu, Amanda Chu

Student Impact:

Number of Students: 65
Grade Range: 7th - 8th
Schools Served:

• Auburn Junior High School
• Opelika Middle School (2 teams)
• McIntosh High School (2 teams)
• Russell County Middle School (2 teams)
• Sanford Middle School
Program: War Eagle BEST

Description: Middle and high school robotics program open to teams in East Alabama and West Georgia

Date: Thursday, August 30th; 6:00 PM - 8:00 PM
       Sunday, September 30th; 12:00 PM - 5:00 PM
       Saturday, October 13th; 7:00 AM - 5:00 PM

Facilities: AU Student Center, Village Mall Auburn, and Smiths Station High School

Personnel:

   AU: Mary Lou Ewald, Erin Percival, Kathy Feminella, Kristin Bond, Molly McCartney,
       Molly Folkerts, Chelsea McMeen, Tj Nguyen, many AU student volunteers

Student Impact:

   Number of Students: ~700
   Grade Range: 6th - 12th

Schools Served:
   • A-2-Z Homeschool
   • Auburn Junior High School
   • Benjamin Russell High School
   • Brewbaker Tech. Magnet High School
   • Chambers County Career Tech.
   • Central Educational Center
   • Columbus Consortium
   • J.F. Drake Middle School
   • Glenwood School
   • LAMP High School
   • Lee-Scott Academy
   • Loachapoka High School
   • Montgomery Catholic Prep. School
   • Opelika High School
   • Opelika Middle School
   • Prattville High School
   • Saint James School
   • Smiths Station High School
   • Southside Middle School
   • Springwood School
   • Stanhope Elmore High School
   • The Heritage School
   • Wetumpka Middle School
   • Wetumpka High School

Warp XX Story Line

Hours before cargo ships arrive at their destination on an equatorial island in the Pacific Ocean, crewmembers can see a thin, bright, vertical line bisecting the sky. As their ships draw closer, they see that the base of the line terminates at a large building that occupies much of the island. Their gazes follow the bright line from the building upward, but they cannot see its far end.

The line is a ribbon of super-strong carbon nanotube that ascends to an asteroid anchored in geosynchronous orbit 62,000 miles above the earth.

It’s called a Space Elevator (SE), and it’s often hailed as the eighth wonder of the modern world. The SE is the premiere low-cost solution for transporting cargo out of Earth’s gravity. The use of SE’s will help expand lunar colonization, exobiological exploration, and asteroid mining. It has already spawned many new industries. The first stop on the SE is the Midway Station (ME), located just above the atmosphere, but well below geosynchronous orbit. The ME is a cargo transfer depot, solar power station, and home-away-from-home for SE engineers and crew.

Warp XX Game Objective

Teams must design and build a robot that can transport cargo and equipment to the ME and carry empty fuel containers back to Earth.
BEST Award Winners
1st Place - Wetumpka High School
2nd Place - Saint James School
3rd Place - Columbus Consortium
4th Place - Brewbaker Tech. Magnet School

Robotics Award Winners
1st Place - Columbus Consortium
2nd Place - Stanhope Elmore High School
3rd Place - Wetumpka High School
4th Place - Saint James School

Sponsors of the Program

Southern Company Workforce Dev.
Southern Company Services
Neptune Technology Group
Southern Nuclear
Hyundai Motor Manufacturing Alabama
Briggs & Stratton
Auburn University Outreach
Boeing
Brasfield & Gorrie
Rheem Water Heaters
Wal-Mart Foundation
TriDelta Systems
AO Tourism
Northrop Grumman
International Space Elevator Consortium
Army ROTC
Alabama Construction Recruitment Institute
SpaceX
Carmichael Engineering
ISA
Program: Getting Under the Surface (GUTS)

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

Date: Tuesday, October 23rd; 6:00 PM - 8:00 PM

Facilities: SCC 115, SCL 231, SCL 310, SCL 323

Personnel:

AU: Mary Lou Ewald, Erin Percival, Kristen Bond, Molly Folkerts, Allison Tjelmeland, Sam Hirt

Non-AU: Amy Rutherford (J.F. Drake Middle School), Aleesa Zutter (Yarbrough Elementary School)

Student Impact:

Number of Students: 16
Grade Range: 1st - 6th

Course: Pumpkin Mania

Have you ever wondered what's in a pumpkin? Where do they come from and why are they so special? How can you measure the size of a pumpkin? What is inside a pumpkin? Is it a fruit? a vegetable? We will use your scientific and investigation skills to delve depinto the pumpkin in this course!

Grades: 1 - 3
Developed by: Aleesa Zutter
Number of Students: 3 (3 reporting on survey)
Student Satisfaction: 5 (out of 5)
Parent Satisfaction: 4.67 (out of 5)

Course: Batty for Bats

Are bats really the creepy, night prowlers that everyone thinks they are? Discover common misconceptions about bats, explore echolocation, and become a bat ‘expert’ when you learn how to identify differences between common bats in Alabama! Come along with me, a local bat authority, as we investigate these flying mammals.

Grade Range: 1 - 3
Developed by: Sam Hirt
Number of Students: 6 (6 reporting on survey)
Student Satisfaction: 4.67 (out of 5)
Parent Satisfaction: 5 (out of 5)

Course: The GUTS of Blood

You have an amazing liquid flowing your veins! Come along as we uncover the inside story on blood and the role it plays in keeping our bodies healthy! We’ll analyze arteries, critique capillaries, and verify veins on our quest to discover the GUTS of Blood. We’ll even mix up a batch of our own entirely edible Halloween Blood as we learn all about the liquid of life.

Grade Range: 1 - 3
Developed by: Amy Rutherford
Number of Students: 7 (7 reporting on survey)
Student Satisfaction: 4.64 (out of 5)
Parent Satisfaction: 5 (out of 5)
**Program:** Kidz-sized Science

**Description:** Preschool program in which students engage in 1.5 hour science themed activities

**Date:** Friday, October 26th, and Friday, November 9th 12:30 PM - 4:00 PM

**Facilities:** Village Mall - Auburn

**Personnel:**

AU: Erin Percival, Kathy Feminella, Mary Lou Ewald  
Non-AU: Amanda Prince

**Student Impact:**

Number of Students: 10  
Grade Range: Pre-K - Kindergarten  
Schools Served: NA

**Topic: Pumpkins**

Students engaged in a book about pumpkins, planted their own pumpkin seeds (inside a pumpkin), and counted pumpkin seeds.

**Grades: Pre-K - Kindergarten**

Developed by: Amanda Prince

**Topic: Birds**

Students discussed birds and their natural habitats, they read about camouflage, engaged in a feather sorting activity, built birdfeeders, and nesting devices.

**Grade Range: Pre-K - Kindergarten**

Developed by: Amanda Prince
Program: South’s BEST

Description: Middle and high school robotics championship open to teams east of the Mississippi River

Date: Saturday, December 1st; 8:00 AM - 9:00 PM

Sunday, December 2nd; 9:30 AM - 5:00 PM

Facilities: Auburn Arena

Personnel:

AU: Mary Lou Ewald, George Blanks, Erin Percival, Kathy Feminella, Kristin Bond, Molly McCartney, Molly Folkerts, Chelsea McMeen, Tj Nguyen, many AU student volunteers

Non-AU: NA

Student Impact:

Number of Students: ~3,500

Grade Range: 6th - 12th

Schools Served:

• Alcorn Central High School (Glen, MS)
• Allen Thornton Career Technical Center (Killen, AL)
• Athens Bible School (Athens, AL)
• Brewbaker Technology Magnet High School (Montgomery, AL)
• Briarwood Christian School (Birmingham, AL)
• Carver Magnet School (Dothan, AL)
• Central Magnet School (Murfreesboro, TN)
• Columbus Consortium (Columbus, GA)
• Cornerstone Christian Preparatory Academy (South Park, PA)
• Cullman Middle School (Cullman, AL)
• Dallas County High School (Plantersville, AL)
• Decatur Austin Robotics Coalition (Decatur, AL)
• Episcopal Day School (Gadsden, AL)
• Faith Academy (Mobile, AL)
• Family Instructors of the North Suburbs (Pittsburg, PA)
• Fernbank LINKS (Atlanta, GA)
• Fyffe High School (Fyffe, AL)
• Glastonbury High School (Glastonbury, CT)
• Gwinnett School of Math, Science, and Technology (Lawrenceville, GA)
• Holly Pond High School (Holly Pond, AL)
• Holy Cross (New Orleans, LA)
• Hope Acadmey (Talladega, AL)
• Keith Middle High School (Orrville, AL)
• LeCroy STEM Academy (Clanton, AL)
• Lindsay Lane Christian Academy (Athens, AL)
• Louis P. Slade Midle School (New Britain, CT)
• MARIO (Clarksville, TN)
• Marshall Technical School (Guntersville, AL)
• Martin Middle School (Valley Grande, AL)
• Mercer Area Middle/High School (Mercer, PA)
• Merrol Hyde Magnet School (Hendersonville, TN)
• Millsaps BEST Robotics (Starkville, MS)
Sponsors of the Program

Southern Company Workforce Dev.
Southern Company Services
Neptune Technology Group
Southern Nuclear
Hyundai Motor Manufacturing Alabama
Briggs & Stratton
Auburn University Outreach
Boeing
Brasfield & Gorrie
Rheem Water Heaters
Wal-Mart Foundation
TriDelta Systems
AO Tourism
Northrop Grumman
International Space Elevator Consortium
Army ROTC
Alabama Construction Recruitment Institute
SpaceX
Carmichael Engineering
ISA
2012 Student Survey Summary

Introduction

The 2012 South’s BEST Robotics Championship Competition was held December 1-2 at the Auburn Arena on the campus of Auburn University. Fifty-seven (57) teams from 8 states were in attendance, with 36 (or 63%) being from Alabama. Other represented states included: Georgia, Florida, Mississippi, Connecticut, Louisiana, Tennessee, Pennsylvania.

Summary of Student Survey

The survey was completed by 1,317 students. The survey asked the students if they were a BEST team member or a visitor supporting a BEST team. The surveys with “Visitor” marked (49 responders total) were taken out for the purpose of analyzing data leaving a total of 1,268 surveys.

Grade Level

Of the 1,268 available surveys in the revised pool, 1,246 students provided their grade level. Middle School students (5th-8th grade) accounted for 33.6% of student attendees, with 66.4% being in high school (9th – 12th grade).

Gender

Of the 1,268 available surveys in the revised pool, 1,262 students provided their gender; 455 were female (36%) and 807 were male (64%).
Gender by Grade Level

Of the 1,268 available surveys in the revised pool, 1,243 students provided both their grade level and gender; 791 male and 452 female.

Years in the Program

Of the 1,268 available surveys in the revised pool (sans Visitors), 1,259 students provided the number of years they’ve participated in BEST. First year students accounted for 49.5%; second year students, 28.4%; third year, 14.9%; fourth year, 4.6%; fifth year, 1.4%; sixth year, 0.9%; and five (5) seventh year students accounted for 0.4%.
As a regional competition, the number of years a student has participated in BEST is not an accurate indication of student attrition. As the program continues to grow, new teams and competition sites are added each year, which brings a new group of students. What this data represents is the innovation and competitive spirit of first year teams and participants.

**Increased Interest in STEM**

Of the 1,268 available surveys in the revised pool (sans Visitors), 1,262 responded to the question. 1,136 (90%) expressed an increased interest in math, science, and/or engineering because of their participation in BEST.

**Plans to Attend College**

Of the 1,268 available surveys in the revised pool (sans Visitors), 4 students did not respond and 15 students did not plan to attend college, while 1,249 did (98.8%). Of those who did not plan to attend college, 2 were female and 13 were male.

Of students who plan to attend a college or university, the following schools were listed as schools of interest: Auburn, 20%; Alabama, 11.4%; Georgia Tech, 4.3%; South Alabama, 3.9%; UAB, 3.7%; UAH, 2%; MIT, 2.4%; Mississippi State, 2.3%; Harvard, 2.3%; UAH, 1.6%; Florida, 1.5%; Montevallo, 1.3%; Florida State, 1.3%; University of West Florida, 1.3%; and LSU, 1.2%. The students who chose more than three schools or were completely undecided accounted for 12.7 percent.
There were 13 available fields of study for students to choose from and an “other” write-in option. The data above represents the frequency of occurrence for the fields of study on the survey. Engineering/Computer Science accounted for roughly 30 percent while COSAM (or medical degrees starting there) accounted for 23 percent. The frequency of “other” was 12 percent with 34 percent of the “other” being undecided. The remaining notable percentages were:

- Agriculture .9%
- Architecture 5.9%
- Business 4.9%
- Communications or Journalism 1.1%
- Criminology or Law 5.1%
- Education 2.8%
- Fine Arts 9.5%
- History, Literature, or English 2.6%
- Psychology 2.2%

**College Interest Among High School Students**

Fifteen students said they had no plans of attending college; thirteen of which were in high school. There were 836 high school students that gave their collegiate plans. The colleges of choice and the percentages of which they are preferred are similar to those of the entire group.

- Engineering/Computer Science was selected by 374 students, or 35.9%.
- COSAM degrees captured 230 students or 22% (over half selecting medicine). The remaining highest concentrations were:
  - Fine Arts: 7.3%
  - Business: 5.0%
  - Architecture: 4.8%
  - Criminology Law: 3.2%
Student Survey 2012

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