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The future university students of Alabama are being prepared for a higher education in physics through the tools and skills gained by secondary education teachers participating in this program. Teacher preparation is critical to ensure that the opportunities for students are not lost in the fields of science and physics due to the lack of proper training in the critical years of high school education. The APEX Program addresses the need for proper teaching tools, pedagogies, and classroom engagement of the students. Further, APEX affords Alabama educators the valuable opportunity to acquire those skills through the workshops tailored to the often difficult to teach subject of physics. Alabama students, high school teachers, and in the future, higher education instructors will feel the positive impact of this forward-thinking approach to physics. It is hoped that APEX will serve as a model for educators in other educational fields as well.
As the 2016-17 academic year approaches to a close, I would like to thank the APEX team for all their hard work, dedication and commitment exhibited throughout the last five years. Our goal was to implement a Mathematics & Science Partnership (MSP) project to transform secondary physics education in Alabama. High School Physics teachers are now better equipped to impact student learning by acquiring a deeper knowledge of physics content and employ more effective pedagogical strategies based on physics education research. Alabama A&M University has been given the opportunity to promote a new instruction model, where preliminary results are showing quantitative and definitive qualitative changes in attitudes, beliefs, and actions of in-service secondary teachers of physics in Alabama. Through this initiative, we are successfully preparing highly qualified physics teachers to enter and remain in the STEM pipeline. APEX's efforts in training physics teachers to be more creative problem solvers with breadth and depth, ultimately reaffirms the University's mission of concentrating on instruction by combining the classic goal of intellectual development with applied and interactive educational experiences.

I am immensely proud of APEX and its contribution to the next generation of science teachers, as we collectively work with certified physics trainers, two and four year educational institutions, private industry, and evaluators to make a significant contribution to the STEM field.

I would like to thank APEX for your service to the College of Engineering, Technology and Physical Sciences, as well as the impact it has made by providing quality professional development for high school physics teachers in the state of Alabama. More importantly, I would like to acknowledge its impact on student performance in the classroom. The National Science Foundation entrusted the University to lead the efforts of transforming physics education in Alabama by providing funding that also contributes to Alabama A&M University's mission of providing the best, most rigorous, and most intellectually exciting professional development in the country.

Experiential learning infused with technology and research are cornerstones of the APEX project. This innovative pairing allows teachers to develop and navigate curricular that allows students to engage more fully in the learning process. APEX continues to be one of Alabama A&M University’s notable achievements that promotes the University's reputation for excellence in merging the field of education, science, technology, engineering, and mathematics (STEM).

As we implement the sixth year of the APEX project, I want to commend the APEX team for their success and encourage everyone to remain steadfastly committed to improving what and how we teach and better prepare our students to achieve their goals and excel in their career fields of choice.
SPECIAL POSTHUMOUS DEDICATION

DR. MOSTafa DOKHANIAN (1957-2014)

Dr. Mostafa Dokhanian, Professor of Physics, in the AAMU Dept. of Physics, Chemistry & Mathematics, spearheaded the penmanship of the APEX program at Alabama A&M University. His tireless dedication was instrumental in bringing about the success of the proposal for the grant and the program’s implementation.

Dr. Dokhanian’s devotion to the program, as the Principal Investigator (PI) for APEX, was paramount to the success of its various activities and workshops. He died on the job after working late on one of the program’s workshops on January 26, 2014. Dr. Dokhanian was PI and Co-PI for various grants, including AAMU-REU, (PS)2, and HBCU-UP.

For 22 years, Dr. Dokhanian taught many undergraduate and graduate students and worked on research projects in physics specializing in optics. As an academic advisor, he greatly influenced the education and lives of many undergraduate students, and also as an advisor or co-advisor to twelve M.S. and five Ph.D. students.

Dr. Dokhanian’s dedication to Alabama A&M University, its Physics Department, the many students he taught or helped to fund, his friends, and family led to his being highly valued, respected, and revered by all who knew him.
The Alliance for Physics Excellence (APEX) is a Math & Science Partnership (MSP) Targeted project awarded and funded by the National Science Foundation for $8 million over a six-year period. The overall goal of APEX is to transform secondary physics education in Alabama by enabling physics teachers to acquire a deeper knowledge of physics content and employ more effective pedagogical strategies based on physics education research, enabling students to achieve higher gains.

APEX is serving as a comprehensive agent of change by successfully integrating cutting edge teaching practices into all secondary physics programs, directly impacting 25% of the physics teachers (with 41,000 students) throughout all Alabama school systems. APEX is led by Alabama A&M University and includes as core partners the University of Alabama at Tuscaloosa, Drake State Community & Technical College, American Association of Physics Teachers/Physics Teaching Resource Agents and Huntsville City School System. The partnership also includes supporting partners from the eleven Alabama Math Science & Technology Initiative regional in-service centers, Madison County schools, Scottsboro City schools, Madison City schools, and the Alabama State Department of Education.
APEX GOALS

- Increase the quantity of highly qualified pre and in-service physics teacher
- Enhance the quality of Alabama secondary physics education
- Establish an environment in which Alabama high school leadership (superintendents, principals, science coordinators) promotes research-based physics education in Alabama secondary school systems
- Identify and document successful pedagogical models and methods for teacher preparation and for in-service development of physics teachers
- Evaluate the implementation impact of APEX on teachers and students in their classrooms
More high school graduates need a physics background for the 21\textsuperscript{st} Century workplace. However, over the past decade the number of highly-qualified physics teachers has not kept pace with the demand. The PTI is a three-year experience that offers participants a coherent program of study to deepen their physics Discipline Content Knowledge (DCK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical Content Knowledge (TPACK). Each year the Physics Teacher Institute will consist of a two-week summer institute followed by three two-day workshops during the academic year (see table on next page for specifics). These two-day sessions will include:

- Nationally renowned educators on various topics of pedagogy
- Additional DCK and TPACK content
- Feedback and reflection on classroom application of summer workshop materials (research)
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<td>Newton’s Laws of Motion</td>
<td>Temperature &amp; Heat</td>
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THREE COMPONENTS OF APEX

1. Alabama Physics Education Center (APEC) - comprised of two components:
   i. Physics Teacher Institute (PTI) - a multi-year experience offering participants a coherent program of study to deepen their DCK, PCK and increase their TPACK
   ii. Physics Resource Enhancement Program (PREP) - a central clearinghouse for dissemination of best teaching practices

2. Physics Leadership Development (PLD) – aimed at involving teachers in every stage of policy-making affecting the physics curriculum

3. Physics Teaching Research (PTR) - establishes and sustains project outcomes in teaching and learning through development of a research priority, using a community of researchers focusing on physics education by action research
DISCIPLINE CONTENT KNOWLEDGE (DCK)

The primary goal of DCK is to raise awareness that 21st century physics courses must integrate components of exploration (EX), conceptual understanding (CU), and problem solving (PS) within a single unit of study.

- EX will include training in PASCO equipment, safety issues, and development of graphing analysis using computer programs such as Excel and Logger Pro.
- CU will introduce teachers to resources for conceptual questions that can be used through peer instruction methods.
- PS will address the development of reading and communication skills for problem solving.

Teachers will see a variety of approaches (graphical, numerical, analytical, and verbal) that may be used to solve the same problem. The AAPT/PTRA teacher resource guides will act as a model for this effort. When completed, teachers will have a ready set of resources appropriate for their teaching situation.
PEDAGOGICAL CONTENT KNOWLEDGE (PCK)

PCK is defined as a special amalgam of content and pedagogy that is uniquely the providence of teachers. PCK is the teacher’s comprehension of how to help students understand specific subject matter. It includes knowledge of particular subject matter topics, problems, and issues to be organized, represented and adapted to the diverse interests and abilities of learners.

TECHNOLOGY PEDAGOGICAL CONTENT KNOWLEDGE (TPACK)

TPACK builds on PCK and attempts to capture some of the essential qualities of knowledge required by teachers for technology integration in their teaching, while addressing the complex multifaceted and situated nature of teacher knowledge. Teachers shall be exposed to a systematic introduction into the use of technology as it pertains to pedagogics. Topics include presentation tools, simulations, visualization tools, podcasting, Wikis, blogs, groupware, and social media.
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Dianne Kirnes .................................................. 12
Marius Schamschula ......................................... 13
Elizabeth VanderPutten .................................... 13
Matthew Edwards ............................................. 13

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Paul Norgaard ............................................... 14
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### ALABAMA SCIENCE IN MOTION SPECIALISTS (ASIM)

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<tr>
<td>Robin Chestnutt</td>
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### ALABAMA MATH, SCIENCE & TECHNOLOGY EQUIPMENT MANAGERS (AMSTI)

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### APEX PRE-SERVICE SCHOLARS & CLASSROOM OBSERVERS

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</table>
Doreen Brisendine

ASIM Physics Specialist
University of North Alabama

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EDUCATION:
Master’s in Education, Secondary Science, University of Alabama in Birmingham
Bachelor’s in Secondary Education, Athens State University
Bachelor’s in Animal Science, University of Connecticut

EXPERIENCE:
Sixteen years: Teacher, public education; seven years: ASIM Specialist

APEX IMPACT OBSERVATIONS:
I now incorporate the four-step method into my workshops when appropriate.

---

Robin Chestnut

ASIM Physics Specialist
University of South Alabama

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Bachelor of Science in Secondary Education General Science, University of South Alabama

EXPERIENCE:
Five years: Teacher, Grand Bay High School; eighteen years: ASIM Specialist

APEX IMPACT OBSERVATIONS:
Teachers in my district who have attended APEX use many of the activities in their classrooms and express that the activities and teaching strategies have improved their physics teaching and their students’ learning.
Jason Cole

ASIM Physics Specialist
Jackson State University

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EXPERIENCE:
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APEX IMPACT OBSERVATIONS:
(No reply)

Julie Covin

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EDUCATION:
Master of Education in Secondary Education, University of West Alabama
Bachelors in Secondary Education, University of Alabama

EXPERIENCE:
Twenty-two years: Teacher

APEX IMPACT OBSERVATIONS:
I've very much enjoyed the strategy of white boarding as a formative assessment tool. The four-step method for analyzing graphical data is also extremely useful in helping students gain a better understanding of the relationship between variables. I love the Diagnoser.com website! I am using it as a formative assessment tool in my teacher trainings.
Kelly Ford

ASIM Physics Specialist
Athens State University

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EXPERIENCE:
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APEX IMPACT OBSERVATIONS:
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Charles “Chuck” Hanke

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EDUCATION:
Master of Education in Secondary Education
Bachelor of Science in Physics, Education & Computer Information Science

EXPERIENCE:
Twenty years: Physics Teacher; nine years: Physics Specialist ASIM

APEX IMPACT OBSERVATIONS:
I have seen my teachers implementing APEX training and more confidently implement new and revised lab experiences in their classrooms.
Elizabeth Tommi Holsenbeck

ASIM Physics Specialist
Alabama State University

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EDUCATION:
Bachelor of Science in Physics, Auburn University
Certification in General Science Secondary Education, University of Alabama

EXPERIENCE:
Nineteen years: Science Teacher, Jeff Davis High School-Physics, Chemistry, Physical Science, Principles of Technology, and Technology

APEX IMPACT OBSERVATIONS:
I am thrilled with the impact APEX can make on physics in Alabama. Teachers will break out of the "giving the information" mode, allowing students to discover and internalize concepts. Alabama Physics Teachers now have learning cycles, formative assessment, video analysis, graphing for a reason, resources from Science in Motion specialists and more.

Stan Hart

APEX Physics Specialist
University of Alabama at Birmingham

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Bachelor’s, Auburn University
Bachelor’s, University of Alabama at Birmingham

EXPERIENCE:
2003-present: Science in Motion Physics Specialist, University of Alabama at Birmingham; teaching since 1993

APEX IMPACT OBSERVATIONS:
( No reply)
Eric Lambert

ASIM Physics Specialist
University of Alabama at Birmingham

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EXPERIENCE:
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APEX IMPACT OBSERVATIONS:
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Carla McPeters

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Athens State University

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EDUCATION:
Bachelor of Science in Comprehensive Science, Athens State University
Bachelor of Science in Mathematics, Athens State University
Master of Education in Mathematics, University of North Alabama

EXPERIENCE:
Twenty-Four years: Teacher-High School Math and Science, Hazel Green High School (6 years), West Limestone High School (18 years); one year: ASIM Physics Specialist, Athens State University

APEX IMPACT OBSERVATIONS:
APEX has been one of the most useful professional development workshops I have ever attended. I can honestly say that if any workshop ever changed the way I approached teaching, it was this one. While carrying out labs with students, I feel as though I am more keenly aware of even the smallest details involved in questioning, student learning, and understanding of material. I am thankful for the resources, strategies, and professional Physics contacts I have made through APEX; they are invaluable. From a teacher perspective, Diagnoser and Elicitation Questions are both excellent means of formative assessment. The four step method and graphical analysis of data helps connect the mathematical and scientific worlds for students. And, whiteboarding serves as a means for students to condense, illustrate, calculate, and vocalize their discoveries to a larger group granting the student ownership of their own learning.
Tommy Morgan

ASIM Physics Specialist
Jacksonville State University

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Bachelor of Science in Chemistry, Auburn University
Associate of Science in Math, Gadsden State Community College

EXPERIENCE:
1994-present: ASIM Physics Field Specialist, Jacksonville State University.

APEX IMPACT OBSERVATIONS:
I have observed that APEX teachers now use more hands-on activities to deliver lessons. White boarding and the four-step analysis of graphs are often used. Formative feedback from Diagnoser is VERY popular.

Dan O’Halloran

ASIM Physics Specialist
AMST Equipment Manager
University of Alabama at Huntsville

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EDUCATION:
Master’s in Secondary Science Education, University of West Alabama
Bachelor of Science in Applied Physics, Auburn University
Bachelor's in Secondary Education, Auburn University

EXPERIENCE:
Fifteen years: Physics Specialist, Alabama Science in Motion; three years: High School Physics Teacher; PLD sessions participant, Alabama A&M University and University of Alabama at Huntsville regions

APEX IMPACT OBSERVATIONS:
The APEX grant has changed my approach to teaching and my perception of the role of laboratory activities in physics instruction. Prior to APEX, the primary use for labs was to verify concepts taught in class. Now, hands-on activities are used to build upon and challenge student thinking. Also, formative assessment with regard to student thinking and misconceptions are a significant part of instructional planning. As a physics specialist, I have documented how the physics teachers in my region have changed their use of and frequency they hands-on activities in their classrooms.
William “Bill” Ossenfort

ASIM Physics Specialist
Troy University

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EDUCATION:
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Bachelor of Science in Physics, Auburn University

EXPERIENCE:

APEX IMPACT OBSERVATIONS:
I keep getting to recruit teachers and communicate graphical analysis to my region. The modeling and graphical analysis has been a significant leap forward, especially for those teachers who have not had a strong background in physics.

Christina Steele

ASIM Physics Specialist
Auburn University

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EDUCATION:
Master of Education in Secondary Science, University of Montevallo
Bachelor of Science in Chemical Engineering, Oregon State University

EXPERIENCE:
Chemical Engineer, International Paper; Science Teacher-Physics and Chemistry, Holtville High School; Science Teacher, AP Physics C-Physics, and Chemistry, Prattville High School; Physics Specialist, Auburn University Science in Motion

APEX IMPACT OBSERVATIONS:
I serve several teachers that are participating in the APEX program. These teachers are very excited about the program. I have seen content growth and an increase in confidence.
Jeff Woods

ASIM Equipment Manager
Athens State University

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EDUCATION:
Master’s, University of North Alabama
Bachelor’s, Harding University

APEX IMPACT OBSERVATIONS:
The best thing about the APEX program is that it is so practical. It is not costly, and the ideas and equipment utilized can easily be made part of any physics class. It follows a logical process of development of ideas that is easy to understand.
Sarah Campo

UA Pre-Service Scholar
Junior
Alabama A&M University

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MAJOR:
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UA Classroom Observer  
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**Marsha Simon**

UA Classroom Visitation Coordinator  
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**Christina Sciaroni**

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**Marilyn Stevens**

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Ph.D. Graduate Student  
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**MAJOR:**  
Science Education
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Christina Marie Caldwell
Science Teacher
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District: Gadsden City
Principal: Keith Blackwell
Superintendent: Dr. Ed Miller
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ASIM Specialist: Tommy Morgan
EDUCATION:
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Bachelor of Science in Secondary Education General Science,
Jacksonville State University
EXPERIENCE:
Ten years: Teacher-AP Physics and Physics, Gadsden City High School
(four years); four years: Science Teacher-Physics, Emma Sansom High School
APEX IMPACT OBSERVATIONS:
APEX has been the most beneficial workshop I have ever attended. It has given me tools to reduce the time I lecture and increase students’ hands-on activities, all while increasing their physics knowledge.

David L. Hall
Science Teacher
School: Sylacauga High School
District: Sylacauga City
Principal: Jason Bryant
Superintendent: Michael Freeman
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ASIM Specialist: Chuck Hanke
EDUCATION:
Master of Education, University of Montevallo
Bachelor of Science in Physical Science & Biology, Troy University
EXPERIENCE:
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APEX IMPACT OBSERVATIONS:
(No reply)
Mara Johnson

Science Teacher
School: Midfield High School
District: Midfield City Schools
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Superintendent: Demica Sanders

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Alabaster, AL 35007
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ASIM Specialist: Stan Hart

EDUCATION:
Master of Education in Biology Education, Alabama State University
Bachelor of Science in Biology, University of Montevallo

EXPERIENCE:
Fifteen years: Science Teacher-Chemistry, Physics, and Biology

APEX IMPACT OBSERVATIONS:
Before APEX, I only received professional development and training as a Physics Teacher via Alabama Science In Motion. Since participating in the APEX program, I have learned and experienced so many things that are assisting me in becoming a better teacher, especially in physics. I am so grateful for the opportunity to further explore the world of physics as a teacher through APEX.

Mark Maddox

Science Teacher
School: Sparkman High School
District: Madison County
Principal: Michael Campbell
Superintendent: Dr. David Copeland

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ASIM Specialist: Dan O’Halloran

EDUCATION:
Master of Divinity, Southern Baptist Theological Seminary
Bachelor’s in Secondary Education (Majors: Physics & Math), Auburn University

EXPERIENCE:
Fifteen years: Teacher, public High School; five years: Teacher, College

APEX IMPACT OBSERVATIONS:
APEX has impacted my classroom by making me more hands-on conscious and giving me a plethora of new ideas for effective physics instruction.
Angela Michelle McLeod

Science Teacher
School: Pleasant Grove High School
District: Jefferson County
Principal: Wayne A. Byram
Superintendent: Dr. Craig Pouncey

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ASIM Specialist: Stan Hart

EDUCATION:
Master of Education in Secondary Science Education, University of Alabama at Birmingham
Bachelor of Science in Biology (Minor: Chemistry), University of Alabama at Birmingham

EXPERIENCE:
2005-present: Teacher-AP Chemistry & AP Physics, Jefferson County

APEX IMPACT OBSERVATIONS:
My teaching has completely changed. I have a student focused classroom as opposed to a teacher centered classroom. My students love physics class. We are always “doing things.” I believe my students really have a deeper understanding of physics concepts.

APEX has been the most beneficial workshop I have ever attended. It has given me tools to reduce the time I lecture and increase students’ hands-on activities, all while increasing their physics knowledge.

Angela Olguin

Science Teacher
School: Ashford High School
District: Houston County
Principal: James Odom
Superintendent: Tim Pitchford

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ASIM Specialist: Bill Ossenfort

EDUCATION:
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Bachelor’s in Comprehensive Science Education, Troy University

EXPERIENCE:
Five years: Physics Teacher; one year: Participant, ASIM

APEX IMPACT OBSERVATIONS:
My teaching has shifted to more inquiry learning and student-centered strategies as opposed to teacher lead, teacher centered.
Cynthia Phillips

AP Physics & Pre-Engg Academy COORD
School: Demopolis High School
District: Demopolis City
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Superintendent: Dr. Al Griffin

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ASIM Specialist: Julie Covin

EDUCATION:
Master of Arts in Science Comp., University of West Alabama
Bachelor of Science in Biology & Environmental Science, University of West Alabama

EXPERIENCE:
Sixteen years: Physics Teacher, Demopolis High School (2007 Teacher of the Year); 2004-2014: Science Department Head; Organizer: local Science Fairs; Science Olympiad teams Sponsor, Tuscaloosa, AL

APEX IMPACT OBSERVATIONS:
The APEX program has completely changed the way I teach - no more lecture and PowerPoint presentations!! We do labs/activities to collect data and draw conclusions, and from this we derive formulas and make predictions. We love it! The kids struggle at first because it is a completely new way of thinking, but they realize that they are learning HOW to think instead of a mass of facts to memorize!

Rochelle Polnitz Williams

Science Teacher
School: The Calhoun School
District: Lowndes County
Principal: Kenneth E. Fair
Superintendent: Dr. Daniel Boyd

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ASIM Specialist: Tommi Holsenbeck

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Master of Education in Curriculum & Technology, Grand Canyon University
Bachelor of Science in Biology (Minors: Chemistry & Physics), Troy University

EXPERIENCE:
Fifteen years: Teacher, The Calhoun School (for nine years)

APEX IMPACT OBSERVATIONS:
Being a participant of the APEX program has allowed me to become more of a facilitator in my students learning.
Timothy Williams

Science Teacher
School: Baker High School
District: Mobile County
Principal: Clem Richardson
Superintendent: Martha L. Peek

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ASIM Specialist: Robin Chestnutt

EDUCATION:
Bachelor of Science in Meteorology, University of South Alabama

EXPERIENCE:
2010-present: Science Teacher-Physics HR, Baker High School;
2006-2010: Vigor High School-various sciences, including Physical Science, Physics, Earth/Space Science, Geology, and Meteorology, Prichard, AL; 2005-2006 Marine weather forecaster, Alert Weather Services, Lafayette, LA

APEX IMPACT OBSERVATIONS:
The APEX program has taught me methods of teaching physics that I never realized existed. My students are challenged more and are able to really think about and discuss physics.
Krista Agerton

**Science Teacher**  
**School:** George W. Long High School  
**District:** Dale County  
**Principal:** Jason Steed  
**Superintendent:** Danny Bynum

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ASIM Specialist: Bill Ossenfort

**EDUCATION:**  
Bachelor of Science in Biology, Troy University

**EXPERIENCE:**  
Eight years: Teacher

**APEX IMPACT OBSERVATIONS:**  
I have implemented more hands on activities and greatly reduced my lecture time. I allow the students to investigate and discover more on their own.

Timothy Ashley

**Science Teacher**  
**School:** Stanhope Elmore High School  
**District:** Elmore County  
**Principal:** Dr. Samby McGowin  
**Superintendent:** Dr. Andre Harrison

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ASIM Specialist: Christina Steele

**EDUCATION:**  
Bachelor’s, Auburn University

**EXPERIENCE:**  
Eleven years: Teacher, Stanhope Elmore High School (currently); one year: Hazel Green High School; six years: John L. LeFlore High School

**APEX IMPACT OBSERVATIONS:**  
APEX has changed my entire teaching philosophy.
Mary Kate Beane

Science Teacher
School: Theodore High School
District: Mobile County
Principal: Ronnie Rowell
Superintendent: Martha L. Peek

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ASIM Specialist: Robin Chestnutt

EDUCATION:
Bachelor of Science in Biomedical Science, University of South Alabama

EXPERIENCE:
Seven years: Teacher- currently Chemistry CP, Honors Physics CP, and AP Chemistry, Theodore High School

APEX IMPACT OBSERVATIONS:
It has completely changed my method of instruction in physics - lots of PTI activities, white boarding, ranking tasks, and discussions. I have also applied these methods to my other classes and employ white boarding in AP chemistry and physical science.

Meridith Chiaro

Science Teacher
School: Murphy High School
District: Mobile County
Principal: William S. Smith
Superintendent: Martha L. Peek

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ASIM Specialist: Robin Chestnutt

EDUCATION:
Bachelor of Science in Meteorology, University of South Alabama

EXPERIENCE:
(No information available)

APEX IMPACT OBSERVATIONS:
(No reply)
Joan Crocker

Science Teacher  
School: Wilcox Central High School  
District: Wilcox County  
Principal: Dr. Lenoise Richey  
Superintendent: Dr. Tyrone Yarbrough

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Camden, AL 36726  
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ASIM Specialist: Tommi Holsenbeck

EDUCATION:  
Bachelor's in Secondary Education, University of Alabama at Birmingham  
Bachelor of Science in Secondary Education, University of Montevallo

EXPERIENCE:  
Five Years: Physics teacher

APEX IMPACT OBSERVATIONS:  
Because of the APEX program, I have a different understanding of what is important about teaching physics from my previous understanding. I have been challenged to become a better teacher as a result of APEX. Now I understand that students not only need to be able to do calculations and graphs, but also exhibit graphing skills, be able to explain physics results in terms of graphs, communicate laboratory results to fellow students, and recognize they are part of the scientific community. I personally feel more confident that I have a better sense of the direction my physics class needs to take, and appreciate the opportunity the APEX program has provided.

Frances Coleman

Science Teacher  
School: Scottsboro High School  
District: Scottsboro City Schools  
Principal: Kathy Hughes  
Superintendent: Dr. Sandra Spivey

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fcoleman@scottsboroschools.net

ASIM Specialist: Dan O’Halloran

EDUCATION:  
Bachelor of Science in Microbiology, University of Alabama

EXPERIENCE:  
Six years: Physics Teacher; Participant: Career Technology Engineering STEM classes (current)

APEX IMPACT OBSERVATIONS:  
APEX has deepened my content understanding and taught me how to deepen my students' ability to make learning connections.
**David Frederick**

Science Teacher  
School: Bob Jones High School  
District: Madison City Schools  
Principal: Dr. Brian Clayton  
Superintendent: Dr. Dee Fowler

**CONTACT INFORMATION:**  
P.O. Box 452  
Madison, AL 35758  
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**EDUCATION:**  
Master of Science in Geosciences, Mississippi State University  
Master of Education in General Science, Alabama A&M University  
Bachelor of Science in Human Biology, University of Wisconsin

**EXPERIENCE:**  
Six years: Teacher, High School-Physics, Pre-AP Physics, Astronomy, and Physical Science; one year: Teacher-Intro to Engineering Design and Aeronautical Engineering

**APEX IMPACT OBSERVATIONS:**  
In my classroom, I’ve increased the amount of activity based learning that occurs. I’ve also improved in the quantity and quality of the formative assessment that we do.

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**Lee Grosenbach**

Science Teacher  
School: Brantley High School  
District: Crenshaw County  
Principal: Dodd Hawthorne  
Superintendent: Terry Holley

**CONTACT INFORMATION:**  
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**ASIM Specialist:** Bill Ossenfort

**EDUCATION:**  
Bachelor of Science in Biology, Troy University

**EXPERIENCE:**  
Five years: Teacher, Secondary Education science

**APEX IMPACT OBSERVATIONS:**  
APEX flipped the role of teacher as a facilitator of learning, not director. It brought inquiry based learning and hands-on activities back to science classes in my school.
Lynne Renee Hammonds

Science Teacher  
School: Oxford High School  
District: Oxford City Schools  
Principal: Chris Cox  
Superintendent: Dr. Jeff Goodwin  

CONTACT INFORMATION:  
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lhammond.oh@oxford.k12.al.us  
ASIM Specialist: Tommy Morgan  

EDUCATION:  
Master’s in Secondary Education General Science, Jacksonville State University  
Bachelor of Science in Physics, University of Cincinnati  

EXPERIENCE:  
Currently: Teacher–AP Physics, HR Physics, and Physics for Physical Science, Oxford High School  

APEX IMPACT OBSERVATIONS:  
APEX has impacted my teaching in several ways. First, it has taught me a way to teach and apply the four-step method for analyzing graphs that has greatly enhanced the understanding of data for the student. These understandings have linked over into understanding the science questions on the ACT as well. APEX has also given me teaching resources for making my class more hands-on. The students seem to get more knowledge out of an action-based class. Finally, APEX has broadened my subject or content knowledge, helping me with the topics that I have had a hard time understanding myself.

Deborah Harper

Science Teacher  
School: Amelia L. Johnson High School  
District: Marengo County  
Principal: Lepoleon Peterson  
Superintendent: Luther P. Hallmark  

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ASIM Specialist: Julie Covin  

EDUCATION:  
Master of Arts in Education in Curriculum & Instruction, University of Alabama in Birmingham  
Bachelor of Science in Biology, University of Alabama  

EXPERIENCE:  
Eighteen years: Teacher & Substitute Teacher, Marengo County Schools, Georgia, Tennessee, New Mexico, Texas, Maryland, Alabama (Birmingham City Schools & Hoover City Schools), and Midfield City Schools; Member: ASIM Biology, Chemistry, and Physics, AMSTI-grades 7-8  

APEX IMPACT OBSERVATIONS:  
The greatest impact upon my teaching is that I am much more conscious of the value of questioning in my teaching. The care that is taken in the designing and direction of questions is paramount to conceptual learning.
**Jill Harrison**

Science Teacher  
School: Wilson High School  
District: Lauderdale County  
Principal: Gary Horton  
Superintendent: Jennifer Gray  

**CONTACT INFORMATION:**  
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Jill.Harrison@LCschools.org  
ASIM Specialist: Doreen Brisendine  

**EDUCATION:**  
Master of Arts in Comprehensive Science Secondary Education, University of North Alabama  
Bachelor of Science in Comprehensive Science Secondary Education, University of North Alabama  

**EXPERIENCE:**  

**APEX IMPACT OBSERVATIONS:**  
APEX has given me a different approach to presenting material, developing lessons and evaluating student success.

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**Gus Hembree**

Science Teacher  
School: Pisgah High School  
District: Jackson County  
Principal: Mark Guffey  
Superintendent: Kenneth Harding  

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116 Circle 44  
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ASIM Specialist: Dan O’Halloran  

**EDUCATION:**  
Master’s in Secondary Science Education (Physics/Chemistry), Alabama A&M University  
Bachelor of Science in Earth Science, Auburn University  

**EXPERIENCE:**  

**APEX IMPACT OBSERVATIONS:**  
I can tell a noticeable difference in my teaching and the impact on my students due to APEX.
Phillip Herring

Science Teacher
School: Fairhope High School
District: Baldwin County
Principal: Jon Cardwell
Superintendent: Robbie Owen

CONTACT INFORMATION:
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pherring@bcbe.org
ASIM Specialist: Robin Chestnutt

EDUCATION:
Ph.D. in Educational Research, University of Southern Mississippi
Ed. Specialist in Educational Leadership, University of South Alabama
Master of Education in Science, University of South Alabama
Bachelor of Science in General Science, University of South Alabama

EXPERIENCE:
Nineteen years: Physics Teacher-currently: Physics and AP Physics C/ Mechanics

APEX IMPACT OBSERVATIONS:
The APEX program has allowed me to incorporate a broader range of hands-on activities in my classroom that time constraints do not allow me to develop on my own. As part of the APEX program, I am also provided the opportunity to work with other physics teachers. This is an enormous asset because we are usually isolated and we seldom have an opportunity to discuss physics topics and concepts with other teachers. Overall, the APEX program has had a positive impact on my students and me.

Kevin Horton

Physics Teacher
School: Etowah High School
District: Atalla City
Principal: Jeff Colegrove
Superintendent: David Bowman

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ASIM Specialist: Tommy Morgan

EDUCATION:
Master of Education in Secondary Science Education, Jacksonville State University
Bachelor of Education in Secondary Science Education, Jacksonville State University

EXPERIENCE:
Thirteen years: Teacher-Chemistry and Physics

APEX IMPACT OBSERVATIONS:
The APEX program has brought real science into my classroom. Instead of teaching a lesson, I am simply providing my students with the opportunity to investigate.
Sheri Humphrey

Science Teacher
School: Oak Mountain High School
District: Shelby County
Principal: Kristi Sayers
Superintendent: Randy Fuller

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shumphrey@shelbyed.k12.al.us
ASIM Specialist: Chuck Hanke

EDUCATION:
Master of Education in General Science, University of Montevallo
Bachelor of Science in Pulp Paper Technology, North Carolina State University

EXPERIENCE:

APEX IMPACT OBSERVATIONS:
More labs, more inquiry, more discussion, more basic physics understanding, and more student-centered activities.

Timothy E. Horton

Science Teacher
School: Reeltown High School
District: Tallapoosa City
Principal: Tom Cochran
Superintendent: Joseph Windle

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thorton@tallapoosak12.org
ASIM Specialist: Christina Steele

EDUCATION:
Master’s in Secondary Education, William Carey University
Bachelor of Science in Fishery Management, Mississippi State University

EXPERIENCE:
Sixteen years: Teacher

APEX IMPACT OBSERVATIONS:
APEX has impacted my classroom, school, and district in a positive manner
LaTisha Jackson

Science Teacher  
School: Cold Springs High School  
District: Cullman County  
Principal: Tim Burleson  
Superintendent: Dr. Craig Ross

CONTACT INFORMATION:  
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ASIM Specialist: Jeff Woods

EDUCATION:  
Master of Education in Biology, Alabama State University  
Bachelor of Science in Biochemistry, Auburn University  
Bachelor of Science in Medical Technology, Auburn University  
Bachelor of Science in Education, Athens University

EXPERIENCE:  
Six years: Teacher

APEX IMPACT OBSERVATIONS:  
APEX has allowed me to do more inquiry lab activities than I had done in previous year. My students figure concepts out for themselves and are able to build their own knowledge.

Brandi Jones

Science Teacher  
School: Carver High School  
District: Montgomery Public Schools  
Principal: Gary Hall  
Superintendent: Margaret Allen

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Montgomery, AL 36111  
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brandi.ziegler@mps.k12.al.us  
ASIM Specialist: Tommi Holsenbeck

EDUCATION:  
Master of Education in Biology, Alabama State University  
Bachelor of Science in Chemistry, Miles College

EXPERIENCE:  
2008-present: Teacher, Carver High School, Montgomery, AL; one year: Teacher, Bellingrath Junior High School, Montgomery, AL; two years: Teacher, Calhoun High School, Lowndes County, AL

APEX IMPACT OBSERVATIONS:  
The laboratory activities are great! My students have an opportunity to observe concepts in action instead of only reading about them or memorizing them. They compare their preconceived notions with real data. The labs allow my students to confront their misconceptions and form a foundation upon which to build even more knowledge.
Michael Joreski

Science Teacher
School: Samson High School
District: Geneva County
Principal: DeWayne Hamilton
Superintendent: Becky Birdsong

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ASIM Specialist: Bill Ossenfort

EDUCATION:
Master’s in Math, Troy State University

EXPERIENCE:
Fourteen years: Teacher-Math and Science (eight years); Certification-Math and General Science 6-12

APEX IMPACT OBSERVATIONS:
APEX has taught me how to allow students to self discover what they are otherwise merely told about. It leads to greater understanding of physics ideas.

Jessica Nicole King

Science Teacher
School: Baker High School
District: Mobile County
Principal: Clem Richardson
Superintendent: Martha L. Peek

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jking@mcpss.com
ASIM Specialist: Robin Chestnut

EDUCATION:
Bachelor of Science in Chemistry, University of Southern Mississippi

EXPERIENCE:
Fifteen years: Teacher; five years: Teacher, Mobile County Public Schools

APEX IMPACT OBSERVATIONS:
This is an AMAZING program that I would strongly suggest to anyone! I truly believe in their teaching methods, and the work behind the scenes is tremendous. APEX is by far the best professional development that I have ever participated in during my sixteen years of teaching! I only wish they had the same program for Chemistry! During workshops, we are the students! We do the labs and follow the teaching methods as students. I truly recommend this program to anyone teaching physics! I give them an A+ hands down! APEX needs to continue, and I encourage every Physics Teacher to participate!
Samantha McKissack

Science Teacher  
School: Pinson Valley High School  
District: Bibb County  
Principal: Terry Lawley  
Superintendent: Glenn Judd  

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ASIM Specialist: Stan Hart  

EDUCATION:  
Bachelor’s in General Science Education, Auburn University  

EXPERIENCE:  
Four years: Teacher-Physical Science, Biology, Chemistry, Advanced Chemistry, and one class of Physics  

APEX IMPACT OBSERVATIONS:  
I taught the physics portion of physical science completely different than previous years because I used the things I learned here.  

Rhonda Miller

Science Teacher  
School: Hartselle High School  
District: Hartselle City  
Principal: Jeff Hyche  
Superintendent: Dr. Paul Wilson  

CONTACT INFORMATION:  
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Hartselle, AL 35640  
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ASIM Specialist: Jeff Woods  

EDUCATION:  
Master of Science in Math and Comprehensive Science, Athens State University  
Bachelor of Science in Math and Comprehensive Science, University of North Alabama  

EXPERIENCE:  
Twenty-six years: Teacher-AP Physics, AP Statistics, Pre AP Physics, and Pre AP Pre-Calculus  

APEX IMPACT OBSERVATIONS:  
APEX has provided me the tools to change the way in which students learn physics. My classroom has become student-centered, rather than traditionally teacher-centered. Students are actively discovering concepts through labs, commenting on these concepts in class discussions, and, last but not least, participating and presenting in group-centered activities. These APEX foundational concepts have led to tremendous gains in my students understanding of physics.
Jessica Moore

Science Teacher
School: Walker High School
District: District 7, Jasper City Schools
Principal: Gary Boling
Superintendent: Dr. Ann Jackson

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ASIM Specialist: Doreen Brisendine

EDUCATION:
Master of Arts in Education, Secondary Comprehensive Science, University of Alabama at Birmingham
Bachelor of Science in Zoology, Auburn University

EXPERIENCE:
Five years: Teacher, Walker High School (presently); Sumiton Christian School-6th, 7th, and 8th grade sciences; two years: High School Biology, Chemistry, Zoology, and Environmental Science

APEX IMPACT OBSERVATIONS:
APEX has not only been a great resource for teaching methods, resources, and colleagues but also a source of encouragement. After participation in physics labs and discussions, I am incorporating more guided inquiry lab investigations in my classroom and challenging my students to sharpen their thinking processes.

Amy Martina Norton

Science Teacher
School: Vestavia Hills High School
District: Vestavia Hills City
Principal: Tyler Burgess
Superintendent: Sheilla Phillips

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ASIM Specialist: Chuck Hanke

EDUCATION:
Master of Art in Physics Education, University of Alabama at Birmingham
Bachelor of Science in Biology, Louisiana State University

EXPERIENCE:
Thirty-two years: Teacher, Vestavia Hills High School

APEX IMPACT OBSERVATIONS:
We are doing more student-centered projects and activities to learn each concept before introducing mathematics to complete our mastery.
Wendy Roberts

Science Teacher  
School: Lincoln High School  
District: Talladega County  
Principal: Andy Keith  
Superintendent: Dr. Suzanne Lacey

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ASIM Specialist: Chuck Hanke

EDUCATION:  
Bachelor of Science in Chemistry, Jacksonville State University

EXPERIENCE:  
Three years: Teacher, B.B. Comer High School; six years: Teacher, Lincoln High School

APEX IMPACT OBSERVATIONS:  
The biggest impact I saw was in the deeper understanding of concepts my students gained from the APEX process. Combining the activities that Jane and Jim gave us with the elicitation activities and diagnostic quizzes from Jim was highly successful.

Justin Sanders

Science Teacher  
School: Huffman High School  
District: Birmingham City  
Principal: John Lyons  
Superintendent: Dr. Spencer Horn

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ASIM Specialist: Stan Hart

EDUCATION:  
Master of Science in Electrical Engineering, University of Michigan at Ann Arbor  
Bachelor of Science in Electrical Engineering, University of Michigan at Ann Arbor

EXPERIENCE:  
Two years: Teacher-Career/Tech Pre-Engineering; three years: Teacher-Mathematics; two years: Teacher-Science

APEX IMPACT OBSERVATIONS:  
APEX has opened my eyes to inquiry-based teaching. The methods I have learned have been helpful in getting students engaged in the learning process.
Brian Sexton

Science Teacher  
School: Hokes Bluff High School  
District: Etowah County  
Principal: Scott Calhoun  
Superintendent: Dr. Alan Cosby  

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ASIM Specialist: Tommy Morgan

EDUCATION:  
Master of Science in Secondary Education General Science, Jacksonville State University  
Bachelor of Science in General Education, Jacksonville State University  
Associate in Science, Gadsden State Community College

EXPERIENCE:  
Science Teacher, Grades 9th-12th-Chemistry, Physics, Physical Science, and AP Chemistry

APEX IMPACT OBSERVATIONS:  
APEX is one of the most helpful programs I have participated in ten years of teaching. Teacher education at the university level should be structured more around classroom activities instead of research and philosophy. I would strongly encourage every physics teacher to participate in a program like APEX.

Chere Smith

Chemistry & Physics Teacher  
School: Smith's Station High School  
District: Lee County  
Principal: Joaquin Richards  
Superintendent: Dr. Mac McCoy  

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Salem, AL 36874  
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ASIM Specialists: Christina Steele and DeWayne Riddle

EDUCATION:  
Master's Graduate Student in General Science Education, University of Alabama  
Bachelor's in General Science Education, Auburn University  
Associate of Science, Southern Union State Community College

EXPERIENCE:  
Fourteen years: Teacher

APEX IMPACT OBSERVATIONS:  
APEX has provided my students with a variety of instructional strategies, activities, and assessment tools in the classroom. At our school, I am now working to provide students with the opportunity to take Physics yearly in a classroom setting, rather than online only. Our district is working with our school to provide opportunities to other teachers in our county while allowing me to continue the research.
Jennifer Talbot

Science Teacher
School: Brindlee Mountain High School
District: Marshall County
Principal: Bobby Buford
Superintendent: Cindy Wigley

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EDUCATION:
Bachelor of Science in Zoology, University of New Hampshire

EXPERIENCE:
Nine years: Teacher, Marshall County; five years: Middle School
Teacher-7th & 8th grade science; three years: Participant, improving Physics & Chemistry teaching in Secondary Education (IMPACTSEED)

APEX IMPACT OBSERVATIONS:
The use of the four-step analysis has helped students realize where equations come from. New labs with hands on activities to teach and/or reinforce physics concepts.

Cynthia Thomas

Science Teacher
School: Shades Valley High School
District: Jefferson County
Principal: Mary B. Blankenship
Superintendent: Dr. Craig Pouncey

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cynthiathomas@jefcoed.com

EDUCATION:
Bachelor’s in Secondary Education Comprehensive Science, University of Alabama
National Board Certified Teacher AYA Science (Physics concentration)

EXPERIENCE:
Nineteen years: Teacher

APEX IMPACT OBSERVATIONS:
APEX has really helped provide lab investigation to introduce students to the concepts instead of simply confirming a concept. Four-Step Analysis ROCKS!
Brian Usry

Science Teacher
School: Gadsden High School
District: Etowah County
Principal: Dr. Miria King-Garner
Superintendent: Dr. Alan Cosby

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ASIM Specialist: Christina Steele

EDUCATION:
Master of Science in Marine Science, NCST
Bachelor of Science in Geology, University of South Alabama

EXPERIENCE:
Ten years: Teacher

APEX IMPACT OBSERVATIONS:
My students were not attending class (absences were a problem) prior to implementing APEX activities, now they rarely miss and enjoy physics.
Penny Bonds

Science Teacher
School: Dallas County High School
District: Dallas County
Principal: Todd Reece
Superintendent: Hattie Shelton

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ASIM Specialist: Tommi Holsenbeck

EDUCATION:
Master's of Art in Science Education, University of Alabama at Birmingham
Bachelor's of Art in Biology, Huntingdon College

EXPERIENCE:
Seventeen years: Teacher-Honors Anatomy & Physiology, Physics, Physical Science, and Earth and Space (one year: Hueytown High School; twelve years: Minor, formerly Bottenfield, Middle School-8th grade; four years: Dallas County)

APEX IMPACT OBSERVATIONS:
Having never taught physics before, this has deepened my understanding of concepts. It has also changed the way I address concepts in the classroom, allowing for more investigation from the students.

Jeremy Borchardt

Science Teacher
School: Foley High School
District: Baldwin County
Principal: Russ Moore
Superintendent: Edward Tyler

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ASIM Specialist: Robin Chestnutt

EDUCATION:
Bachelor of Science in Comprehensive Science Education, Troy University

EXPERIENCE:
Ten years: Teacher-AP Physics 1, Earth and Space Science

APEX IMPACT OBSERVATIONS:
It has increased my depth of knowledge as well as my students. My students test scores have gone up versus the previous years. The APEX program has been used by myself and our counselors as a recruitment tool for our physics program.
Kristan Bryant

Science Teacher
School: District: Autauga County
Principal: Richard Dennis
Superintendent: Spence Agee

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ASIM Specialist: Tommi Holsenbeck

EDUCATION:
(No information available)

EXPERIENCE:
(No information available)

APEX IMPACT OBSERVATIONS:
(No reply)

Ramona Cole

Science Teacher
School: West Morgan High School
District: Morgan County
Principal: Keith Harris
Superintendent: Billy Hopkins

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ASIM Specialist: Kelly Ford

EDUCATION:
Master’s in Chemistry and Education; University of Alabama in Huntsville
Bachelor of Science in Chemistry, University of North Alabama

EXPERIENCE:
Nine years: Teacher, West Morgan High School

APEX IMPACT OBSERVATIONS:
Apex has been a big help in teaching Physics.
Christian Collins

Science Teacher  
School: Oak Mountain High School  
District: Shelby County  
Principal: Dr. Kristi Sayers  
Superintendent: Randy Fuller  

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ASIM Specialist: Chuck Hanke  

EDUCATION:  
Master’s in Education, University of Alabama at Birmingham  
Bachelor of Science in Biology, University of Alabama at Birmingham  

EXPERIENCE:  
Eight years: Teacher  

APEX IMPACT OBSERVATIONS:  
APEX has given me a better methodology for presenting physics concepts in class. It has made my overall teaching more meaningful which in turn makes the students learning more meaningful. I truly think students learning concepts (no matter the science) using the APEX model, have a more thorough understanding and better retention of key ideas than learning concepts through the traditional style of teaching.

Kenya Curry-Harbin

Science Teacher  
School: B. C. Rain High School  
District: Mobile County  
Principal: Marlon Firle  
Superintendent: Martha Peek  

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7364 Willow Bridge Drive  
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ASIM Specialist: Robin Chestnutt  

EDUCATION:  
Master of Science in Physics, Alabama A&M University  
Bachelor of Science in Physics, Alabama A&M University  

EXPERIENCE:  
Sixteen years: Teacher-Physics, Physical Science, Forensics, Human A&P, Zoology, Marine Biology, and Biology, Dallas, TX and Mobile, AL  

APEX IMPACT OBSERVATIONS:  
My classroom has learn affected tremendously by APEX. My students show a letter understanding of physics concepts and enjoy learning through the numerous hands on activities. All physics teacher in the distract enjoy the use of instructional labs which accelerate & ensure learning in the classroom.
Melanie Dimler

Science Teacher
School: Hewitt-Trussville High School
District: Trussville City Schools
Principal: Tim Salem
Superintendent: Dr. Patricia Neill

CONTACT INFORMATION:
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melanie.dimler@trussvillecityschools.com

ASIM Specialist: Tommi Holsenbeck

EDUCATION:
Master of Natural Science in Physics, Louisiana State University
Bachelor of Science in Mechanical Engineering, Louisiana State University

EXPERIENCE:
Six years: Teacher-Physics, AP Physics B, AP Physics 1, and PLTW Principles of Engineering (POE)

APEX IMPACT OBSERVATIONS:
As a result of my participation in the APEX program, my classroom has become a more student centered environment in which students learn science by doing science. Each unit begins with a collaborative discovery lab, through which students learn how to analyze scientific data graphically and mathematically, then verbally explain and justify experimental results through white-boarding (which we call "Board Meeting"). Apex has provided the Physics Department at Hewitt-Trussville High School with quality, research-based Physics pedagogy training and content resources.

Jennifer Daniels

Science Teacher
School: Stanhope Elmore High School
District: Elmore County
Principal: William Bergeron
Superintendent: Richard Dennis

CONTACT INFORMATION:
400 Main Street
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jennifer.daniels@elmoreco.com

ASIM Specialist: Christina Steele

EDUCATION:
Master of Education in Educational Leadership, Auburn University
Bachelor of Science in Secondary Education General Science, Auburn University

EXPERIENCE:
Twenty years: Teacher-Honors Biology, AP Physics, Honors Chemistry, and Physical Science

APEX IMPACT OBSERVATIONS:
APEX has provided an interactive way for students to learn Physics.
Nicole Dumas

Science Teacher
School: Ramsay High School
District: Birmingham City School
Principal: Cassandra Fincher Fells
Superintendent: Dr. Larry Contri

CONTACT INFORMATION:
1112 19th Avenue NW
Birmingham, AL 35215
Work: (205) 231-7000
Home/Cell: (205) 401-2664
nadumas19@gmail.com
ASIM Specialist: Stan Hart

EDUCATION:
Bachelor of Science in Chemistry, Fish University

EXPERIENCE:

APEX IMPACT OBSERVATIONS:
(No reply)

Leslie Freeman

Science Teacher
School: Southside High School
District: Etowah County School
Principal: Chris Winningham
Superintendent: Dr. Alan Cosby

CONTACT INFORMATION:
Address: 1515 Lasseter Road
Southside, AL 35907
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leslie_freeman@ecboe.org
ASIM Specialist: Tommy Morgan

EDUCATION:
Master's in General Science Secondary Education, Jackson State University
Bachelor’s in General Science Secondary Education, Jackson State University
Education Specialist in Secondary Education General Science

EXPERIENCE:
(No information available)

APEX IMPACT OBSERVATIONS:
(No reply)
Paul Furman

Science Teacher
School: Thompson High School
District: Alabaster City
Principal: Dr. Wesley Hester
Superintendent: Dr. Wayne Vickers

CONTACT INFORMATION:
2200 Chandabrook Drive
Pelham, AL 35124
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paul.furman@alabastercity.org
ASIM Specialist: Chuck Hanke

EDUCATION:
Master of Art in Education in Secondary Mathematics, University of Alabama at Birmingham
Bachelor of Science in Mathematics, Univ. of Alabama at Birmingham
Certifications: Class A, Secondary (6-12) Mathematics, Class B, Secondary (6-12) Physics

EXPERIENCE:
Four years: Teacher-Physical Science, Pre-AP Physics, AP Physics 1, and AP Physics 2, Thompson High School; Teacher-Mathematics, Point University

APEX IMPACT OBSERVATIONS:
APEX has been a valuable resource to me both as a new teacher in general as well as specifically helping me grow stronger in my Physics content so I can better communicate with my students and present topics and activities in a way that they will be able to better grasp. I have also developed a network of fellow Physics teachers via APEX, and that collaboration has proven to be invaluable. It is by far the best PD I have experienced in my teaching career.

Rhonda Johnson

Science Teacher
School: Plainview High School
District: DeKalb County
Principal: Tony Richards
Superintendent: Dr. Jason Barnett

CONTACT INFORMATION:
827 County Road 447
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ASIM Specialist: Dan O’Halloran

EDUCATION:
(No information available)

EXPERIENCE:
Twenty-five years: Teacher-Anatomy, Physiology, Chemistry, and Physics

APEX IMPACT OBSERVATIONS:
APEX has helped to deliver methods of teaching based on Next Generation Science Standards. Students are exposed to lab activities that reinforce and introduce topics. These activities have increased student interest in Physics.
Robyn Lowe
Science Teacher
School: J. U. Blacksheer High School
District: Monroe County
Principal: Donald Baggett
Superintendent: Greg Shehan

CONTACT INFORMATION:
37 Sellers Street
Monroeville, AL 36460
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ASIM Specialist: Robin Chestnutt

EDUCATION:
Bachelor of Science in Chemistry (Minor in Psychology), Troy University
Alternate Bachelorette Certificate, Athens State University

EXPERIENCE:
Five years: Teacher-Math, Science, and Psychology

APEX IMPACT OBSERVATIONS:
APEX has allowed me to make my class more student-centered, inquiry-based, rigorous, and hands-on.

Jonathan Ling
Science Teacher
School: Daphne High School
District: Baldwin County
Principal: Meredith Foster
Superintendent: Edward Tyler

CONTACT INFORMATION:
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jdling@bcbe.org

ASIM Specialist: Robin Chestnutt

EDUCATION:
Master of Education in Physics, University of Alabama at Birmingham
Bachelor of Science in Physics, Lipscomb University

EXPERIENCE:
2003-present: Teacher

APEX IMPACT OBSERVATIONS:
APEX has shown me a new way of teaching using inquiry. My students have a much better grasp of the principles covered in class and no longer rely on just plugging things into formulas.
Kimberlee Mabry

Science Teacher  
School: Opelika High School  
District: Opelika City  
Principal: Farrell Seymore  
Superintendent: Dr. Mark Neighbors  

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2923 McKinley Drive  
Opelika, AL 36804  
Work: (334) 745-9215  
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kathryn.madzar@opelikaschools.org  
ASIM Specialist: Christina Steele

Master of Science in Secondary Science Education, Auburn University  
Bachelor of Science in Bio-systems Engineering, MS

EXPERIENCE:  
Six years: Teacher-Physics Honors, AP Physics, PLTW Principles of Engineering, Pre-AP Chemistry, and Physical Science

APEX IMPACT OBSERVATIONS:  
More student engagement, deeper level of understanding, higher scores in class and on AP exam.

Kathryn Madzar

Science Teacher  
School: West Blocton High School  
District: Mobile County  
Principal: Terry Lawley  
Superintendent: Martha Peek  

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20461 Hephzibah Church  
McCala, AL 35111  
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mabryk@bibbed.org  
ASIM Specialist: Charles Hanke

EDUCATION:  
(No available information)

EXPERIENCE:  
(No available information)

APEX IMPACT OBSERVATIONS:  
(No reply)
Rhonda Major

Science Teacher
School: Central High School
District: Phoenix City
Principal: Thomas Vickers
Superintendent: Randy Wilkes

CONTACT INFORMATION:
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rmajor@pcboe.net
ASIM Specialist: Tommy Morgan

EDUCATION:
Master of Science in Chemical Engineering
Bachelor of Science in Chemistry

EXPERIENCE:
Fifteen years: Teacher-High School

APEX IMPACT OBSERVATIONS:
I have changed the spoon fed traditional Power Point lectures, problem solving the use lab to convince to allowing the students to take charge of their own learning by starting with a lab and allowing them to figure out what the maintenance for the day.

Shelby Mann

Science Teacher
School: Lamar County High School
District: Lamar County
Principal: Scott Walker
Superintendent: Vance Herron

CONTACT INFORMATION:
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Vernon, AL 35592
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ASIM Specialist: Julie Covin

EDUCATION:
Bachelor of Science, University of Montevallo
Master of Science, Nova Southeastern University

EXPERIENCE:
(No information available)

APEX IMPACT OBSERVATIONS:
The APEX has been a rewarding challenge for me. I did not have a Physics class this year, but I will be teaching Physics this coming year. This program has helped give me a firm foundation. I found the kinematics learning with hands-on investigations a motivating approach to solving problems. I look forward to incorporating the white board as a tool for successful cooperative learning.
Kathleen Moon

Science Teacher
School: Deshler High School
District: Tuscumbia City Schools
Principal: Russell Tate
Superintendent: Darryl Aikerson

CONTACT INFORMATION:
124 Heritage Place
Tuscumbia, AL 35674
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kmoon@tuscmbia.k12.al.us
ASIM Specialist: Doreen Brisendine

EDUCATION:
Master of Science in Chemistry, Vanderbilt University
Bachelor of Science in Chemistry, Murray State University

EXPERIENCE:
Eight years: Teacher-Science, Deshler High School (7 years), Shoals Christian School, Florence, AL (1 year); one year: Teacher-Chemistry, Brazoswood High School, Lake Jackson, TX; six years: Adjunct Professor-Chemistry, Northwest-Shoals Community College, Muscle Shoals, AL; twelve years: Graduate Teaching Assistant, Vanderbilt University, Nashville, TN

APEX IMPACT OBSERVATIONS:
(No reply)

Eldred Pierce

Science Teacher
School: Ardmore High School
District: Limestone County
Principal: Glenn Bryant
Superintendent: Dr. Thomas Sisk

CONTACT INFORMATION:
607 Springwood Circle
Huntsville, AL 35803
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lee.pierce@lcsk12.org
ASIM Specialist: Kelly Ford

EDUCATION:
Bachelor of Science in Biology, Jacksonville State University
Bachelor of Science in Microbiology, University of Tennessee in Knoxville

EXPERIENCE:
(No information available)

APEX IMPACT OBSERVATIONS:
I have increased the number of labs I do with physics students. I also use some of the activities from APEX in my physical science classes.
Michael Poe

Physics Teacher
School: B. B. Comer Memorial High School
District: Talladega County
Principal: Judson Warlick
Superintendent: Dr. Suzanne Lacey

CONTACT INFORMATION:
1523 Brooks Road
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ASIM Specialist: Chuck Hanke

EDUCATION:
Bachelor of Science, Jacksonville State University
Master’s, Auburn University

EXPERIENCE:
Four years: Teacher-Physical Science, Chemistry, Physics, ACT Prep, and AP Chemistry

APEX IMPACT OBSERVATIONS:
(No reply)

Leslie Royer

Science Teacher
School: Carroll High School
District: Ozark City
Principal: Sean Clark
Superintendent: Richard McInturf

CONTACT INFORMATION:
141 Eagle Way
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lroyer@ozarkcityschools.net
ASIM(Specialist: Bill Ossenfort

EDUCATION:
Master of Education in Science Curriculum & Instruction, Concordia University
Bachelor of Science, Middle Tennessee State University

EXPERIENCE:
Thirteen years: Teacher-Middle School Science, High School Biology, Anatomy & Physiology, Physical Science, Physics, and Chemistry

APEX IMPACT OBSERVATIONS:
Apex has helped me show students how to determine their own results and interpret results into the laws of Physics.
Andrew Shaw

Science Teacher
School: Alexandria High School
District: Calhoun County
Principal: Mack Holley
Superintendent: Joseph Dyar

CONTACT INFORMATION:  
198 Clinton Drive
Alexandria, AL 36250
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ashaw.ah@ccboe.us

ASIM Specialist: Tommy Morgan

EDUCATION:
Master of Education in Secondary Education General Science, Jacksonville State University
Bachelor of Education in Secondary Education General Science, Jacksonville State University

EXPERIENCE:
Twenty-six years: Teacher-Physics and Physical Sciences, Alexandria High School

APEX IMPACT OBSERVATIONS:
Using the APEX Model I have the tools to better educate my student on the concepts of physics. Additionally, I have greatly improve my content knowledge, teaching skills and evaluation methods of my students.

Nicholas Sourvelis

Science Teacher
School: Oakman High School
District: Walker County
Principal: Patrick Gann
Superintendent: Dr. Jason Adkins

CONTACT INFORMATION:  
574 Summerville Lane
Jasper, AL 35504
Work: (205) 622-3381
Home/Cell: (205) 522-7207
sourvelisn@wcslive.com

ASIM Specialist: Doreen Brisendine

EDUCATION:
Master of Arts in Education, University of Alabama at Birmingham
Bachelor of Science in Biology, Samford University
Associate of Science, Bevill State Community College

EXPERIENCE:
(No available information)

APEX IMPACT OBSERVATIONS:
APEX teaches Science Teachers how to put students in the driver seat on the path to scientific discovery. Science education has a history of being polar to scientific discovery. Traditionally, information is transferred, not discovered. APEX, in contrast, provides a framework for teachers to give students the opportunity to discover the natural phenomenon of the world first hand, as scientist do. The impact APEX has had on my approach to science instruction has been significant. There have been three major components of great value. In my classroom discovery always comes first. APEX has provided me with the tools needed to demonstrate to my students the power and practicality of mathematical tools typically viewed as abstract and useless by students. The laboratory experience my students have gained from this experience has been paramount. My students have been challenged and enjoyed every moment of it.
Rachel Tawbush

Science Teacher
School: Pell City School
District: Pell City
Principal: Dr. Tony Dowdy
Superintendent: Dr. Michael Barber

CONTACT INFORMATION:
586 Murphrees Valley
Springville, AL 35146
Work: (205) 338-2250
Home/Cell: (205) 516-2120
rachael.tawbush@pellcityschools.net

ASIM Specialist: Jason Cole

EDUCATION:
Master of Education in Secondary Education General Sciences, University of Alabama at Birmingham
Education Specialist in Teacher Leadership, University of Alabama at Birmingham
Certified Genetic Technologies in Alabama Classrooms (GTAC), Hudson Alpha

EXPERIENCE:
Nine years: Teacher-Forensic Science, Project Lead the Way Principles of Biomedical Science; Environmental Scientist-Biologist, and Accident Reconstructionist

APEX IMPACT OBSERVATIONS:
Apex allows students to experience Physics first hand! Apex pulls the students away from their textbooks and into hands-on inquiry based labs. These hands-on labs encourage the students to provide evidence to support their views and have been shown to drastically increase student assessment scores.

Erica Thompson

Science Teacher
School: Lee High School
District: Huntsville City
Principal: Anne Jobe
Superintendent: Dr. Matthew Akin

CONTACT INFORMATION:
1713 Pennylane SE
Decatur, AL 35601
Work: (256) 428-8150
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erica.thompson@hsv-k12.org

ASIM Specialist: Dan O'Halloran

EDUCATION:
Bachelor of Science in Biology (minor: Secondary Education), University of Alabama in Huntsville
Class B Certification, Secondary General Science Education

EXPERIENCE:
One year: Teacher-Chemistry, Physics ,and AP Physics, 7th and 8th grade

APEX IMPACT OBSERVATIONS:
APEX has positively influenced my classroom. This is the first year of training for me.
Robert Workman

Science Teacher
School: Tuscaloosa County High School
District: Tuscaloosa County
Principal: Dr. Cynthia Simpson
Superintendent: Dr. Walter Davie

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14991 Prewitt Loop Road
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rworkman@tcss.net
ASIM Specialist: Julie Covin

EDUCATION:
Master of Art in Educational Administration, University of Alabama
Bachelor of Science in Chemistry, University of West Alabama

EXPERIENCE:
Teacher-Honors Physics, Pre-AP Physics, AP Physics 1, Earth & Space Science

APEX IMPACT OBSERVATIONS:
(No reply)

Amanda Wells

Science Teacher
School: Fort Payne High School
District: Fort Payne City
Principal: Patrick Barnes
Superintendent: James Cunningham

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awells@ftpayk12.org
ASIM Specialist: Dan O'Halloran

EDUCATION:
Master's in Secondary Education & General Science, Jacksonville State University
Bachelor's in Physics (Minor: Mathematics), Berry College

EXPERIENCE:
Teacher-Science and Engineering, Instructor-Project Lead the Way (Engineering)

APEX IMPACT OBSERVATIONS:
(No reply)
APEX EVENTS & ACTIVITIES

DIAGNOSER

APEX collaborated with Facet Innovations, LLC (FI), a consulting firm, on the APEX project. FI provides APEX teachers with technical support for administration and use of assessment and instruction tools accessible through Diagnoser.com (online research-based physics education tool). Assistance is provided via email, phone and/or screen sharing to address issues. Diagnoser assists teachers in online collection of research data relevant to the APEX teachers’ action research projects that incorporate use of Diagnoser Tools, assist in interpreting assessment data that has been collected online and in making instructional decisions based on results of automated analysis.

APEX WEBSITE: http://Alapex.org

An Apex website has been developed by Dr. Marius Schamschula, Co-investigator of this NSF MSP project. The home page has been kept up to date with current content. This website also has wiki and lots of information for the users, including Alabama High School teachers from Cohorts 1, 2 and 3 for Summer Professional Development Physics Teacher Institutes held at Alabama A&M University.

APEX T-SHIRTS

A Reflection of the Participants’ Sentiments

I SURVIVED
3 SUMMERS OF COHORT 1 2013-2015

TOP TEN THINGS I LEARNED
10. Jane is NEVER wrong! Jim says, “YES, DEAR”
9. Teacher happiness directly correlates to the amount of free food in the snack room.
8. According to Jane, Cohort 1 is like the TITANIC.
7. We know where Mr. Jim has travelled by his eclectic assortment of belt buckles.
6. ALL Physics phenomena can be solved with an EXPO marker and a whiteboard.
5. DON’T FORGET YOUR UNITS!!!! NO Naked Numbers!
4. Jim says, “When Jane is gone I can do what I want, WOHOHO!”
3. Jane’s hair defies the laws of physics.
2. If you do not use the Four-Step Analysis, you did NOT come to APEX Cohort 1.
1. Jane is ALWAYS right!!!!
EQUIPMENT CONTRIBUTION TO ALABAMA SCIENCE IN MOTION (ASIM) FOR SUSTAINABILITY

In order to sustain the efforts of the APEX grant and continue to impact physics teachers and students once the APEX grant has ended, APEX will contribute the equipment to the Alabama Department of Education Alabama Science in Motion (ASIM), an AMSTI initiative. This initiative will allow Physics APEX teachers and non APEX teachers access to equipment and experimental laboratories that were used during the APEX grant project.

The 11 ASIM Specialists throughout the state of Alabama will distribute the equipment to teachers upon request and provide laboratory support to implement the experiments for their classrooms. The first contribution is underway in the amount of $213,475.50.

Additionally, the 11 APEX specialists will meet to update the laboratory experiments in the Alabama Course of Study to reflect both ASIM and APEX strategies and techniques.
What is the impact on institutional resources that form infrastructure?

APEX funding provides support to the institution in the form of telecommunication support (radio and TV) to distribute CD/DVDs and advertise the APEX program, renovation of laboratory to accommodate a larger number of teachers and to install new technology. Other infrastructure support is the maintenance of the APEX website by University personnel.

What is the impact on information resources that form infrastructure?

The APEX websites at Alabama A & M University, University of Alabama and J. F. Drake Technical College are used to disseminate information, not only about APEX, but other offerings for these academic institutions, such as academics, special events, etc. to attract more students to their campuses.

What is the impact on society beyond science and technology?

APEX will impact society at large by producing a more sophisticated and prepared workforce. This will be the natural result of highly qualified teachers preparing students in physics classes to better understand our physical universe.
“ALLIANCE FOR PHYSICS EXCELLENCE (APEX) AT ALABAMA A&M UNIVERSITY”

The three minute video submitted in the “NSF Teaching and Learning Video Showcase: Improving Science, Math, Engineering, and Computer Science Education” highlights aspects of the APEX PTI activity through interviews with the in-service teacher participants and one of the Alabama Science in Motion Specialists. The Video Showcase is available on-line at:

http://resourcecenters2015.videohall.com/presentations/546
http://alapex.org
www.aamu.edu/physics

“The Four Step Analysis of Active Learning”

A three minute video was created dealing with the The Four Step Analysis of Active Learning: (1) Statement in complete sentence form of the goal of the experiment; (2) Record what you measured or observed during an experiment; (3) Analysis of data collected; (4) Conclusion. View the APEX Four Step Analysis video at:

http://stemforall2016.videohall.com/presentations/780

“Elicitation Questions as Part of APEX”

http://videohall.com/p/953

APEX PROGRAM WEBSITE AND VIDEOS

http://alapex.org
https://www.youtube.com/watch?v=TduacYOSYQg


APEX PRESENTATIONS

• “Results of APEX (alliance for physics excellence) professional development project,” Session, Teacher Preparation Committee and Research in Physics Education Committee, 2017 AAPT Winter meeting held at Atlanta, GA, February 18-21, 2017.


APEX ALLIANCE PARTNERS

Alabama Agricultural & Mechanical University

American Institute of Research (External Evaluator)

Alabama Math, Science & Technology Initiative (AMSTI)

Alabama State Department of Education

American Association of Physics Teachers (AAPT)

J. F. Drake State Community & Technical College

Huntsville City School System

Horizon Research (External Evaluator)

National Science Foundation (NSF)

University of Alabama, Tuscaloosa