GEAR UP GEORGIA PROFESSIONAL DEVELOPMENT

GEAR UP Georgia
Statewide Partners Conference

October 23-24, 2018

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GEORGIA SOUTHERN UNIVERSITY

GEAR UP Georgia

INSTITUTE for INTERDISCIPLINARY STEM EDUCATION
i² STEMᵉ
SCIENCE TECHNOLOGY ENGINEERING MATH
GEORGIA SOUTHERN UNIVERSITY

OVERVIEW

- GEAR UP Georgia PD
  - Summer 2018
- PD Impact
- Follow Up to PD

GEAR UP GEORGIA PD OVERVIEW SUMMER 2018

- Summer 2018 (June 11-15): two 2 ½ day PD workshops in Macon
  - 9th Grade STEM June 11-13
  - 10th Grade STEM June 13-15
- Goal: engage 9th and 10th grade mathematics and science teachers at GEAR UP Georgia partner schools in SAIL - ICARE

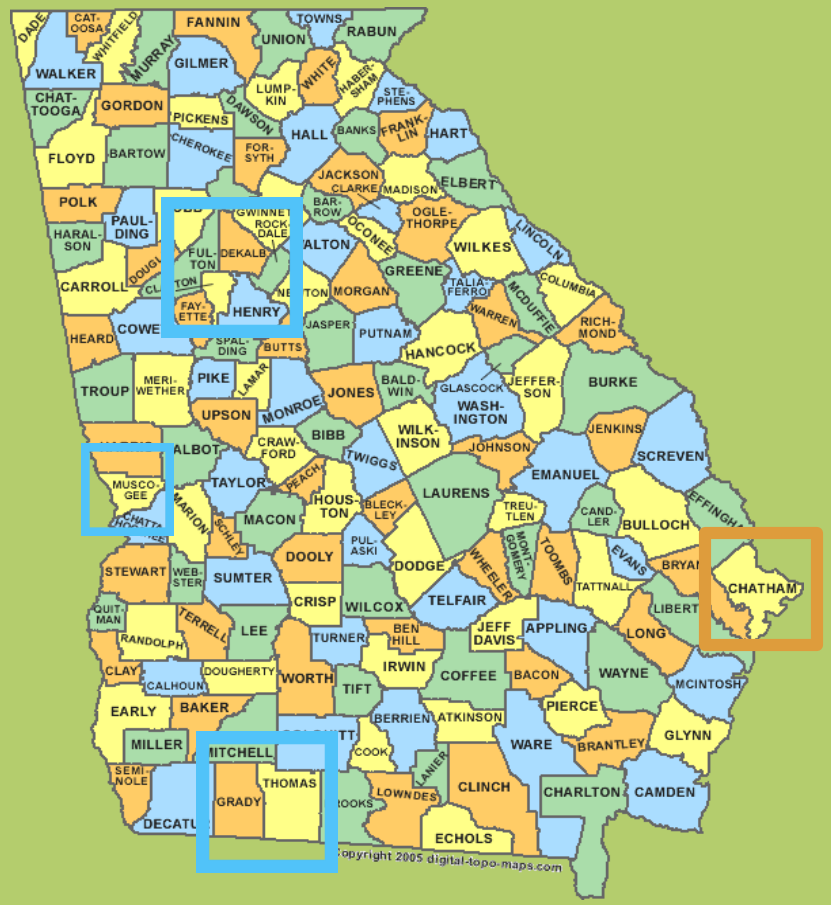
GEAR UP GEORGIA PD OVERVIEW SUMMER 2018

- Outcome: Interdisciplinary STEM Professional Learning Communities (PLC) of teacher participants
  - Introduced to STEM Authentic Interdisciplinary (SAIL) ICARE tenets through hands-on tasks coupled with brief presentations
  - Grouped into PLC consisting minimally of a science teacher and a mathematics teacher
  - Developed interdisciplinary STEM module using the Understanding by Design modified template
  - Implement module in Fall 2018 – Spring 2019 academic year

9th Grade	Monday 6/11	Tuesday 6/12	Wednesday 6/13
7:30-8:00	BREAKFAST	BREAKFAST	BREAKFAST
8:00-8:30	Introduction & Expectations (Mayes and Stueve – Ballroom)	Updates (Huffling and Mayes – Ballroom)	Updates (Stevenson & Greer – Ballroom)
8:30-10:00	**SAIL**: STEM Authentic Interdisciplinary Learning **ICARE Tenets** Irrigation – Biology & Algebra (Huffling & Mayes - Ballroom)	**SAIL**: Incorporating STEM Experts & Field Work Google Science Journal and SensorTag (Huffling & Mayes - Ballroom)	PLC Module Development – Finalizing Module
10:00-10:15	BREAK (Rm#)	BREAK (Rm#)	BREAK (Rm#)
10:15-11:30	Rotation Groups 1A Group 1S Science: Biology/ Environ. Science (Huffling Rm#) Group 2M Mathematics: Algebra (Mayes/Stueve Rm#) Group 3S Literacy in STEM: (Stevenson Rm#) Group 4M Culturally Relevant: (Greer Rm#)	Rotation Groups 2A Group 1S Science: Biology/ Environ. Science (Huffling Rm#) Group 2M Mathematics: Algebra (Mayes/Stueve Rm#) Group 3S Culturally Relevant: (Greer Rm#) Group 4M Literacy in STEM: (Stevenson Rm#)	PLC Poster Walk: Each PLC will develop a poster for their module and an exchange wheel will be setup.
11:30-12:00	PLC Collaboration: Grand Challenge Selection (Breakout Rooms)	PLC Collaboration: Performance Task (Breakout Rooms)	Exit Evaluation
12:00-1:00	LUNCH Rm#	LUNCH Rm#	LUNCH with both 9th & 10th PLCs Rm#
1:00-2:15	Rotation Groups 1B Group 3S Science: Biology/ Environ. Science (Huffling Rm#) Group 4M Mathematics: Algebra (Mayes/Stueve Rm#) Group 1S Literacy in STEM: (Stevenson Rm#) Group 2M Culturally Relevant (Greer Rm#)	Rotation Groups 2B Group 3S Science: Biology/ Environ. Science (Huffling Rm#) Group 4M Mathematics: Algebra (Mayes/Stueve Rm#) Group 1S Culturally Relevant: (Greer Rm#) Group 2M Literacy in STEM: (Stevenson Rm#)	OPTIONAL WORK TIME Rooms will be provided for PLCs to continue work on their modules. The modules are to be submitted before departing from the workshop
2:15-2:30	BREAK (Rm#)	BREAK (Rm#)	
2:30-4:00	PLC Module Development	PLC Module Development	
4:00-4:30	PLC Report out (Ballroom)	PLC Report out (Ballroom)	
4:30-5:00	Wrap Up & Evaluation (Ballroom)	Wrap Up (Ballroom)	
6:00-8:00	Dinner at Marriot Guest Speaker: Kamau Bobb		

10th Grade	Wednesday 6/13	Thursday 6/14	Friday 6/15
7:30-8:00		BREAKFAST	BREAKFAST
8:00-8:30		Updates (Huffling and Mayes – Ballroom)	Updates (Stevenson & Greer – Ballroom)
8:30-10:00		Rotation Groups 2C Group 3S Science: Physical Science (Huffling Rm#) Group 4M Mathematics: Geometry (Mayes/Stueve Rm#) Group 1S Literacy in STEM: (Stevenson Rm#) Group 2M Culturally Relevant: (Greer Rm#)	Rotation Groups 2D Group 3S Science: Physical Science (Huffling Rm#) Group 4M Mathematics: Geometry (Mayes/Stueve Rm#) Group 1S Culturally Relevant: (Greer Rm#) Group 2M Literacy in STEM: (Stevenson Rm#)
10:00-10:15		BREAK (Rm#)	
10:15-11:30		**SAIL**: Incorporating STEM Experts & Field Work Google Science Journal and SensorTag (Huffling & Mayes - Ballroom)	PLC Module Development (Breakout Rooms)
11:30-12:00		PLC Collaboration: Performance Task (Breakout Rooms)	
12:00-1:00	LUNCH with both 9th & 10th PLCs Rm#	LUNCH Rm#	LUNCH Rm#
1:00-2:15	Introduction & Expectations (Mayes and Stueve – Ballroom) **SAIL**: STEM Authentic Interdisciplinary Learning **ICARE Tenets** Irrigation – Physical Science & Geometry (Huffling & Mayes - Ballroom)	PLC Module Development (Breakout Rooms)	PLC Module Development – Finalizing Module
2:15-2:30	BREAK (Rm#)	BREAK (Rm#)	BREAK (Rm#)
2:30-4:00	Rotation Groups 1C Group 1S Science: Physical Science (Huffling Rm#) Group 2M Mathematics: Geometry (Mayes/Stueve Rm#) Group 3S Literacy in STEM: (Stevenson Rm#) Group 4M Culturally Relevant: (Greer Rm#)	Rotation Groups 1D Group 1S Science: Physical Science (Huffling Rm#) Group 2M Mathematics: Geometry (Mayes/Stueve Rm#) Group 3S Culturally Relevant: (Greer Rm#) Group 4M Literacy in STEM: (Stevenson Rm#)	PLC Poster Walk: Each PLC will develop a poster for their module and an exchange wheel will be setup.
4:00-4:30	PLC Collaboration: Grand Challenge Selection (Breakout Rooms)	PLC Report out (Ballroom)	Exit Evaluation
4:30-5:00	Wrap Up & Evaluation (Ballroom)	Wrap Up (Ballroom)	Wrap Up (Ballroom)
6:00-8:00	Dinner at Marriot: STEM Task		

Grant Overview — Partners (Counties)



Bibb *

Chatham (Cohort)

Clayton (Cohort)

Cobb *

DeKalb (Cohort)

Floyd *

Fulton *

Grady (Cohort)

Muscogee (Cohort)

Richmond *

Thomas (Cohort)

**Priority Districts*

WHAT IS SAIL?

- SAIL incorporates a collaborative curriculum design process that engages STEM high school and middle school teachers in developing interdisciplinary STEM curricula. SAIL program objectives are to:

1. improve teacher instructional practice through the implementation of authentic teaching and interdisciplinary STEM pedagogical techniques;
2. improve teachers' understanding of cutting edge STEM through engagement in 21st century STEM reasoning modalities and STEM expert symposiums;
3. enhance students' reasoning and metacognitive awareness in STEM;
4. increase students' engagement and persistence to remain in STEM pathways.

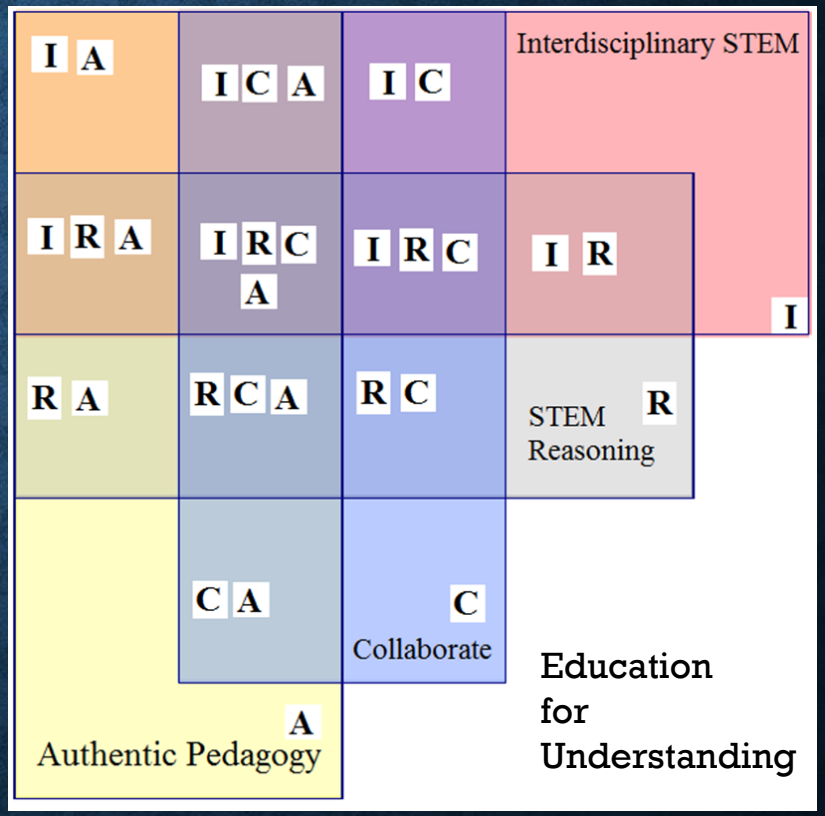
SAIL PROMOTES ISTEM

The SAIL program proposes improving understanding of, as well as engagement and persistence in, interdisciplinary STEM at the middle school and high school level for a broad range of students through professional development and curricular development supporting:

- Implementation of ***interdisciplinary STEM modules*** *within existing high school science and mathematics courses* and creation of new *interdisciplinary STEM research and design Connections Courses at the 8th grade level*;
- Employment of ***authentic teaching methods*** to engage students in interdisciplinary STEM real-world, problem-based research and design challenges; culturally relevant teaching
- Providing *student* ***collaboration with STEM professionals*** from business, industry and research institutes on real-world problem driven tasks, where the experts provide mentoring, field site experiences, internships, and serve on expert panels reviewing final task presentations;
- Focus on *development of student* ***STEM reasoning*** ability as an essential outcome, the ability to view interdisciplinary STEM problems from the perspective of a scientist, computer scientist, engineer and mathematician;
- ***Evaluation*** of the impact of a middle school or high school STEM programs on teacher practice and student mastery of and attitude towards STEM.

SAIL WHAT ARE THE STEM TENETS? ICARE

- **I**nterdisciplinary STEM – integrating science and mathematics and including literacy
- **C**ollaboration – PLC and Community
- **A**uthentic, Culturally Responsive STEM Teaching and Learning
- **R**easoning in STEM – model-based and design-based reasoning in science and mathematics
- **E**ducation for Understanding – UbD framework



STEM PD: job-embedded competency-based professional development

PD IMPACT

- Total teacher participants: 82 (8 attended both 9th and 10th sessions)
  - 9th grade session attendance: 60 attended
  - 10th grade session attendance: 30 attended
  - NOTE: 200 slots available, 110 enrolled, goal to have a mathematics and science PLC pair from each participating HS
    - Chatham 11 HS, 10 enrolled at least a teacher
    - Clayton 12 HS, 9 enrolled at least a teacher
    - DeKalb 20 HS, 15 enrolled at least a teacher
    - Muscogee 10 HS, all 10 enrolled a teacher
    - Thomas HS enrolled 2 teachers
    - Grady (Cairo) HS enrolled 2 teachers

- Virtual PD support provided Fall 2018 – Spring 2019 so still opportunities for teachers from schools to get involved

PD IMPACT

Teacher Survey based on *Concerns-Based Adoption Model*, a well-established model for studying how people develop as they learn about and adopt an innovation.

- The survey asks teachers to rate their level of concern, confidence and commitment with implementing the SAIL ICARE tenets
- The teachers rate their levels on a scale from 0 to 5 by reflecting back on how they felt before and at the beginning of participation in GEAR UP Georgia and how they felt at the end of the workshop.

PD IMPACT

- Wilcoxon Signed Rank test was used to compare paired samples of responses concerning attitudes on authentic teaching before the workshop and after the first day. The Wilcoxon Signed Rank test was used due to the lack of normality in the data distribution.
- The Man-Whitney U-Test was used to compare samples at the end of the workshop to their attitudes prior to the workshop and after the first day. The Man-Whitney U-Test was used because anonymity in completing the survey did not allow for pairing responses and the data distribution lacked normality.

PD IMPACT

- 9th grade session participants demonstrated a significant increase from their prior conceptions to those after just a half-day of the workshop on all five tenets across the three levels of concern, confidence and commitment.
- There was a similar significant increase from day 1 to day 3 of the workshop, except in three tenets under the commitment level: collaboration with experts, authentic teaching, and teaching understanding.
- There was a strong positive response to SAIL over the 3 days of the workshop on all levels and across all tenets.

These findings indicate that the teachers participating in the 9th grade session have a positive attitude about implementing the SAIL tenets.

PD IMPACT

- 10th grade session participants demonstrated a less positive attitude change from their prior conceptions to those after just a half-day of the workshop then their 9th grade counterparts, with only one significantly positive response on the confidence level.
- However from day 1 to day 3 all but four tenets across the three levels showed significant increases.
- From prior to day 3 there was a strong positive response to SAIL on all levels and across all tenets.

These findings indicate that the teachers participating in the 10th grade session have a positive attitude about implementing the SAIL tenets.

FOLLOW UP TO PD

Attitude and action are not always strongly correlated. It is important to provide follow up support and conduct observations to promote implementation in the classroom.

- SAIL team reviewed modules created by 21 PLC
  - 15 9th Grade PLCs: min 2 to max 8 members
  - 6 10th Grade PLCs: min 3 to max 5 members
- Google Drive access to PD materials

https://drive.google.com/drive/folders/1Few-cybBwstKfdJZL

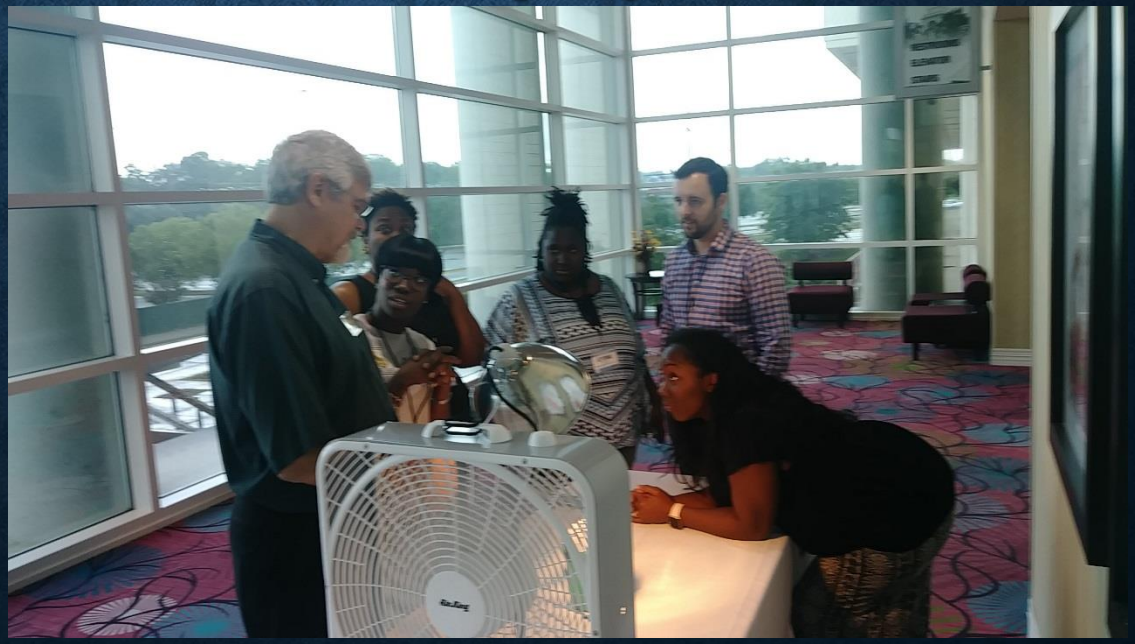
  - GEAR UP Georgia PD Workbook
  - Literacy in STEM materials
  - GEAR UP Georgia PD Modules: all 21 modules and reviews of modules
    - GEAR UP Georgia Module First Group File: see Modules for Review and Review Rubrics
    - GEAR UP Georgia Module Second Group: see Modules for Review and Review Rubrics
- provide opportunities for teachers to receive online support during the academic year (by request)
- conduct observations of classrooms both face-to-face and via video using RTOP observation instrument

INTERDISCIPLINARY STEM MODULES

- Let's go to the Google Drive and look at some of the 21 interdisciplinary STEM modules the teachers developed this summer
- Teachers are to implement the modules in the Fall 2018-Spring 2019 school year

SUPPORT?

- What suggestions do you have for how we can support your STEM teachers?
- Is there interest in increasing the number of PLCs who would participate in virtual PD this fall and spring?



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THANK YOU!

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