



TI STEM Exchange

It Takes a Village

State, Regional, and Community Support for STEM Learning

November 3, 2021 6:00 – 7:30 pm CT



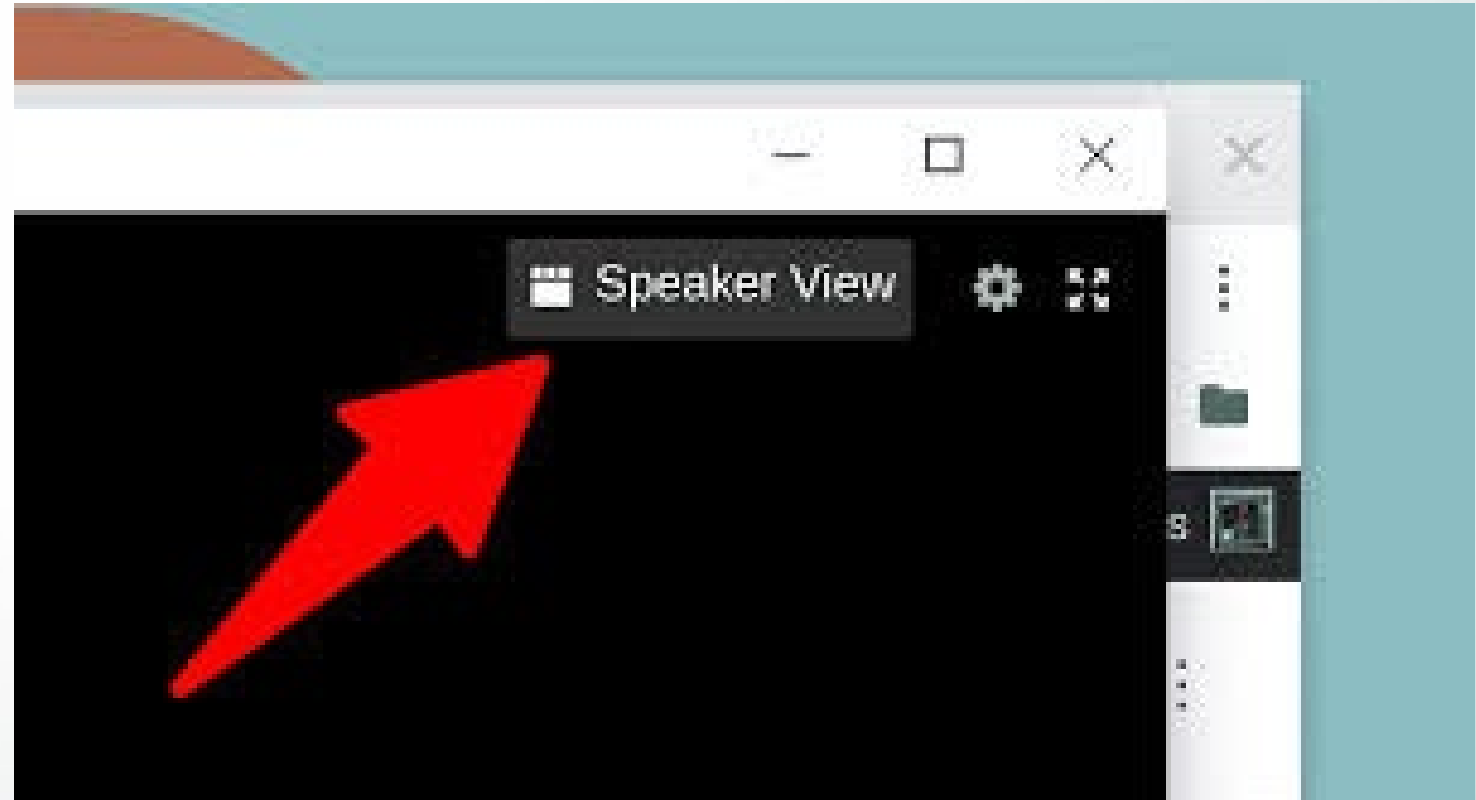
TI STEM Exchange





Select speaker view

- » In the upper right of your Zoom window, select “Speaker View” to ensure you’ll always see the presenter’s video.





MODERATOR

cindy.l.hasselbring@nasa.gov

Cindy Hasselbring

Education Specialist, NASA Office of STEM Engagement

Cindy Hasselbring supports K–12 STEM education at NASA’s Office of STEM Engagement. Previously, she worked in the Education and Human Resources Directorate at the National Science Foundation. Cindy has STEM education policy experience both at the federal and state levels serving as Assistant Director for STEM Education at the White House Office of Science and Technology Policy, leading STEM education at the Maryland State Department of Education, and as an Albert Einstein Distinguished Educator Fellow at the National Science Foundation.

     @TICalculators



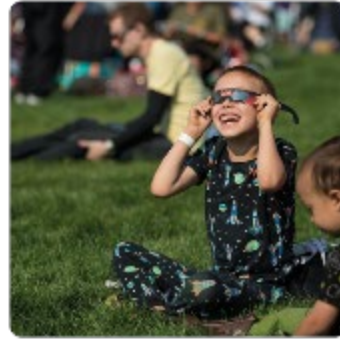
Tonight's Agenda

Panelists' Presentations

- NASA's NextGen STEM resources
- Arkansas STEM Coalition
- Tulsa Regional STEM Alliance
- STEM/STEAM Education in Georgia

"Flipped Panel" Discussion

- » Breakout Group Discussions
- » Panelists' reactions and connections



NASA NEXT GEN STEM RESOURCES

TI STEM EXCHANGE

NOVEMBER 3, 2021



PROJECT OVERVIEW

Next Gen STEM

Reaching student *where they are* using NASA's Missions, content, people, and facilities

K-12 Initiatives

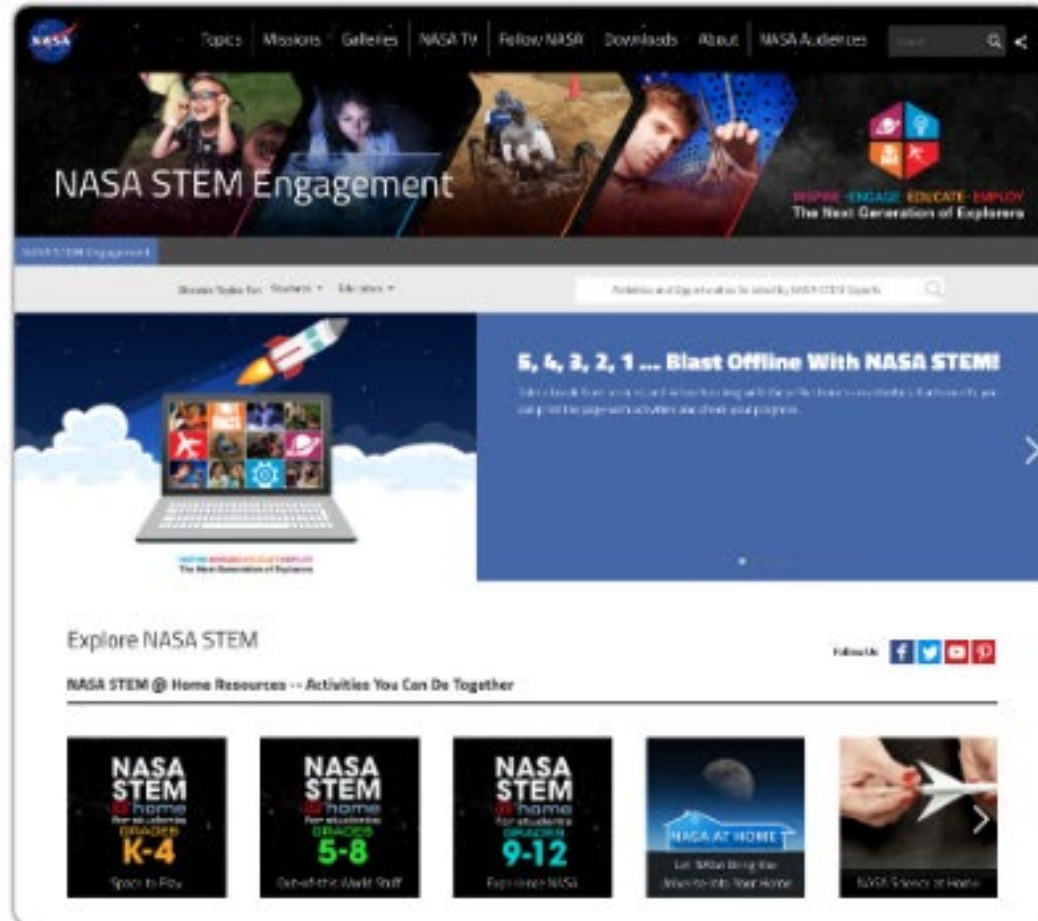
Where? In school, after school, informal education institutions, and at home

What? An integrated portfolio of products, experiences, challenges, and competitive awards that spans educational levels and reduces barriers to entry



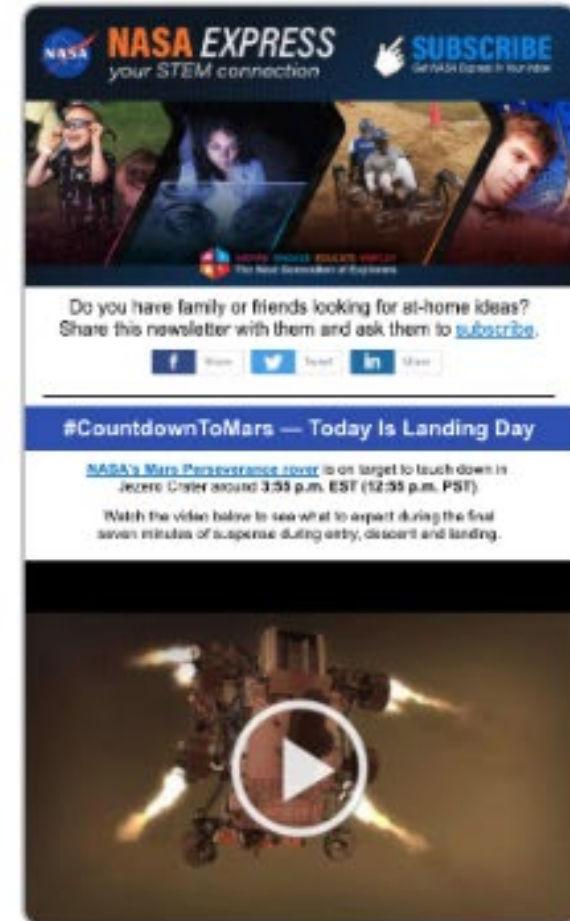
www.nasa.gov/stem/nextgenstem

CONNECT WITH NASA STEM



NASA Office of STEM Engagement

stem.nasa.gov



NASA EXPRESS

www.nasa.gov/stem/express



Meet the speakers



PANELIST

Suzanne Mitchell

Executive Director, Arkansas STEM Coalition

Suzanne taught mathematics at Arkansas State University for 27 years as well as a variety of mathematics courses for grades 7-12 for 22 years. She served as President of the National Council of Supervisors of Mathematics and on many committees and Boards of Directors for STEM organizations. Suzanne has managed several STEM-related NSF grants and brings vast experiences across the educational system in promoting STEM education for all students.

     @TICalculators

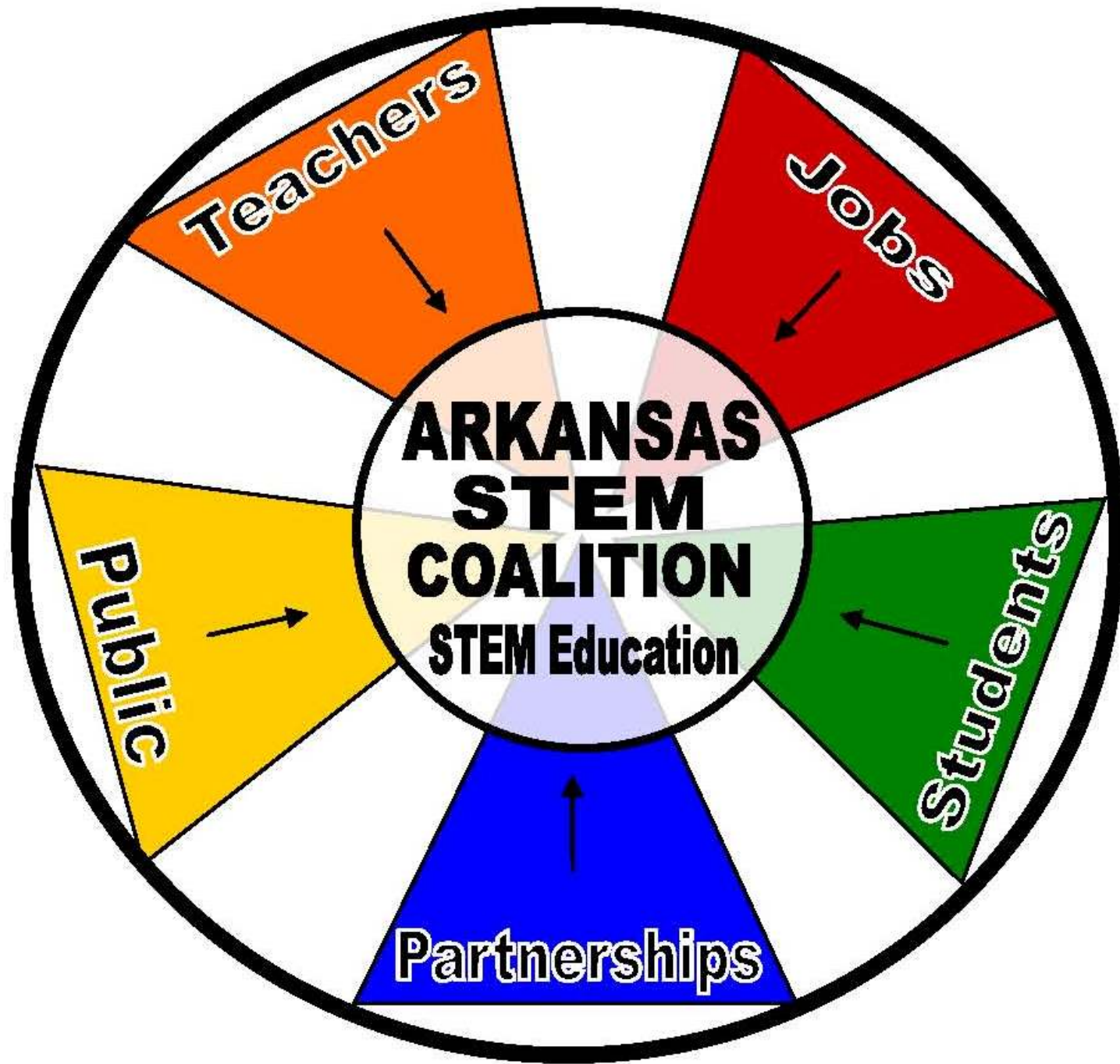
director@arkansasstemcoalition.com

Arkansas

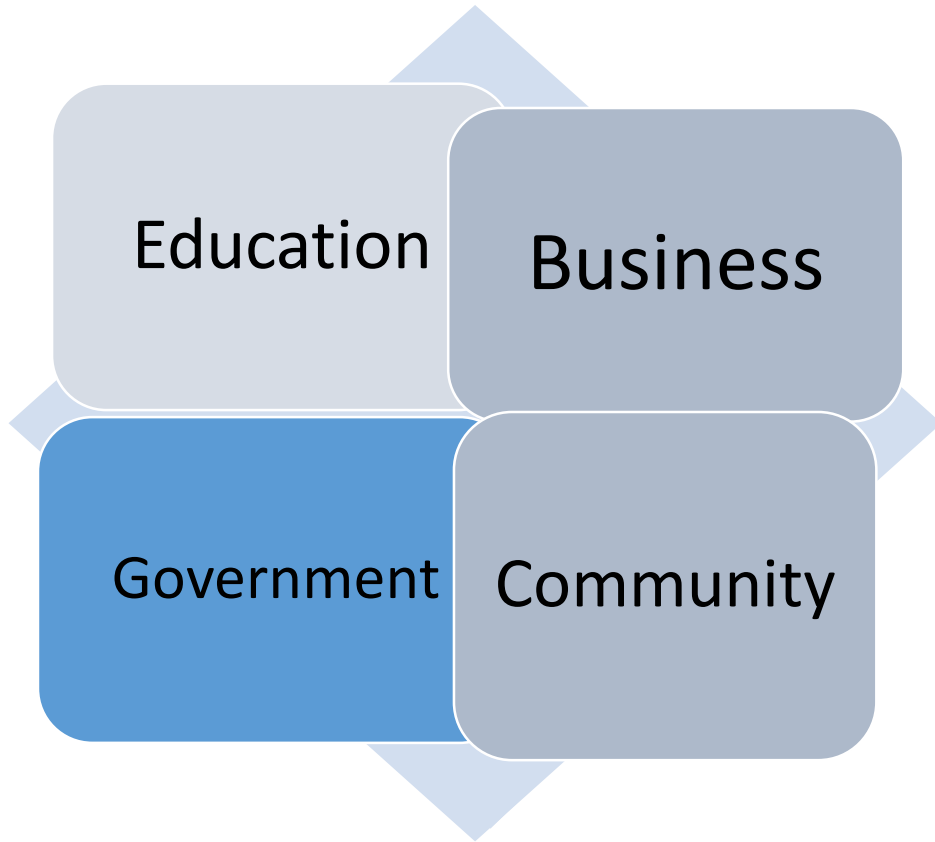


Coalition

SCIENCE ▪ TECHNOLOGY ▪ ENGINEERING ▪ MATH



PARTNERSHIPS



Working Together:

- 1. Challenges of scale**
- 2. Innovation**
- 3. Replication**
- 4. Evaluation**
- 5. Collaboration**

Arkansas Network of Centers for STEM Education 2021

**Center for Math & Science Education
NASA Educator Resource Center
University of Arkansas
346 N. West Avenue
Fayetteville, AR 72701
(479) 575-3875**

**STEM Center for Mathematics & Science
Harding University
Box 12254
Searcy, AR 72149
(501) 279-4242**

**ASU Rural STEM Education Center
Arkansas State University
P.O. Box 2338 State University, AR 72467
(870) 680-8100**

**Institute for Math & Science Educ.
Univ. of Arkansas - Fort Smith
5210 Grand Avenue, Box 3649
Fort Smith, AR 72913
(479) 788-7257**

**ASU Delta STEM Education Center
Arkansas State University
P.O. Box 2338
State University, AR 72467
(870) 897-5124
*Satellite location at East Arkansas Community College,
Forrest City, AR***

**Arkansas Tech University
STEM Center
Corley Building
1811 North Boulder Ave
Russellville, AR. 72801-2222
(479) 968-0331**

**UCA STEM Institute
University of Central Arkansas
212 Main, 201 Donaghey Avenue
Conway, AR 72035-5005
(501) 450-5663**

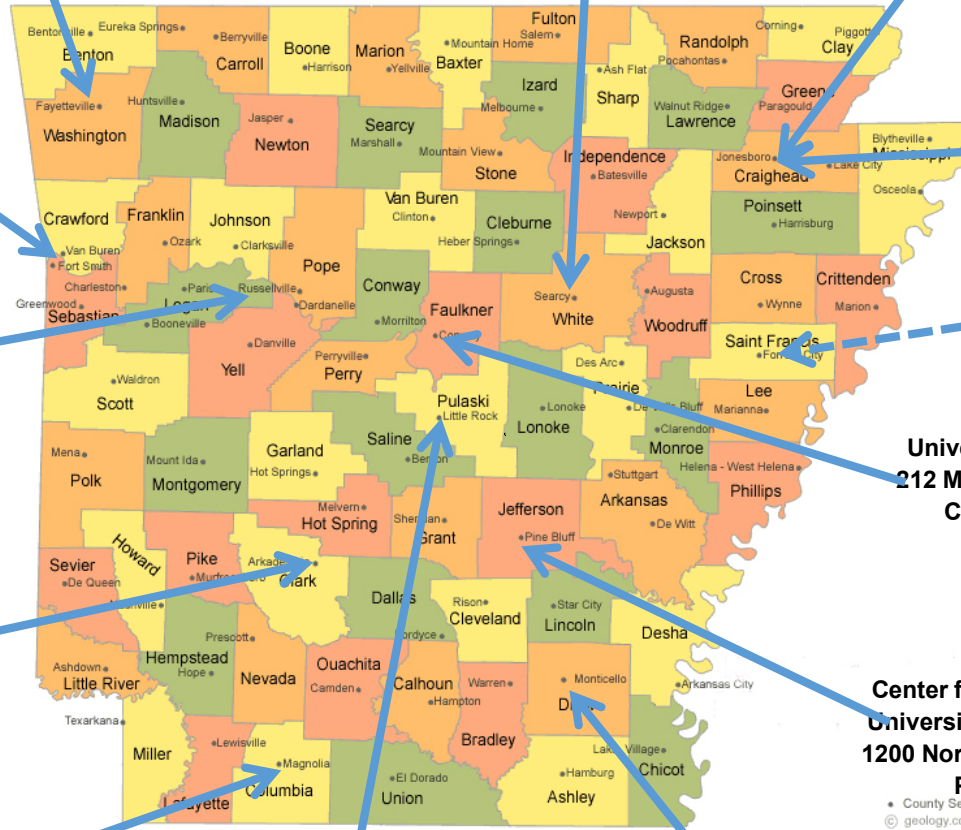
**The STEM Center at Henderson State University
Henderson State University
Box 7663/1100 Henderson St.
Arkadelphia, AR 71999-0001
(870) 230-5417**

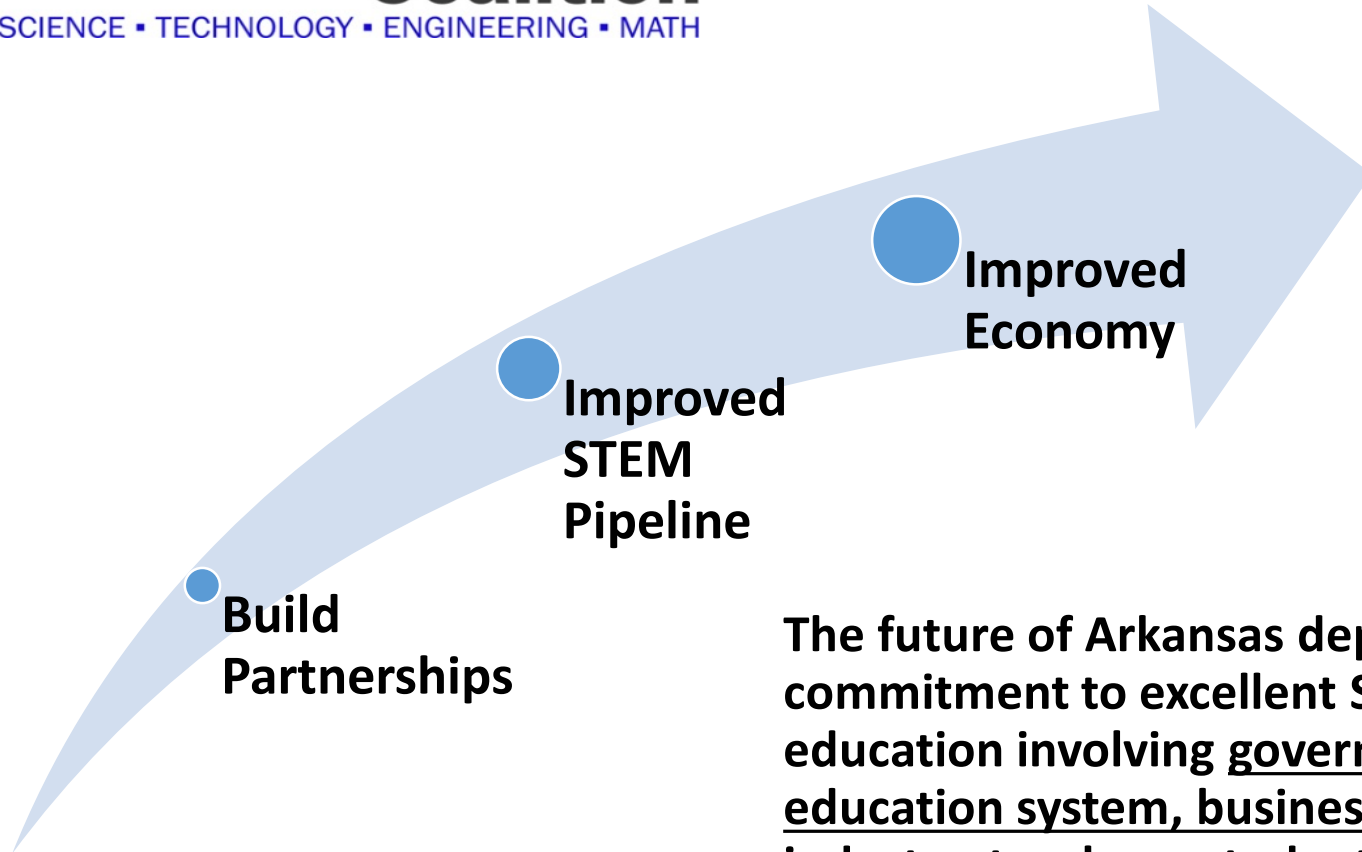
**Center for Math/Science Education
University of Arkansas at Pine Bluff
1200 North University, Mail Slot 4978
Pine Bluff, AR 71601
(870) 575-8051**

**SAU STEM Center for K-12 Education
Southern Arkansas University
P.O. Box 9181
Magnolia, AR 71754
(870) 235-4278**

**Arkansas Partnership for STEM Education
University of Arkansas at Little Rock
2801 South University Drive
Little Rock, AR 72204
(501) 569-8930**

**UAM STEM Center
University of Arkansas at Monticello
UAM Box 3608, Willard Hall
Monticello, AR 71656
(870) 460-1667**

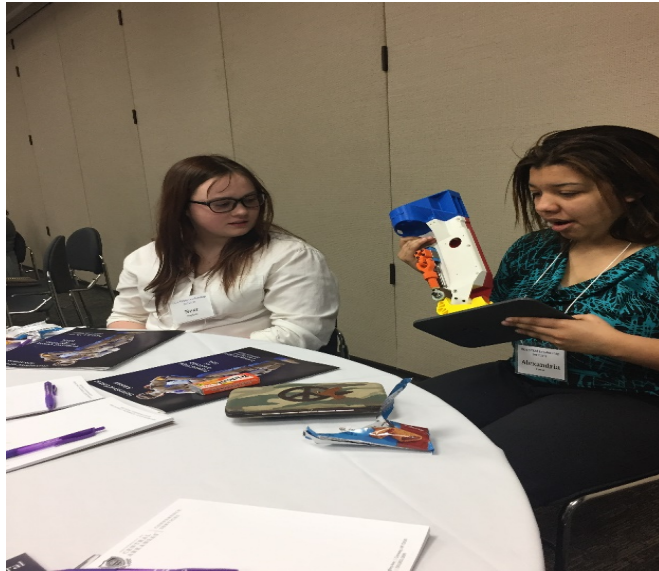




The future of Arkansas depends on a commitment to excellent STEM education involving government, the education system, business and industry, teachers, students, families, and employers.

STEM Girls Leadership Conferences (grades 7-12)

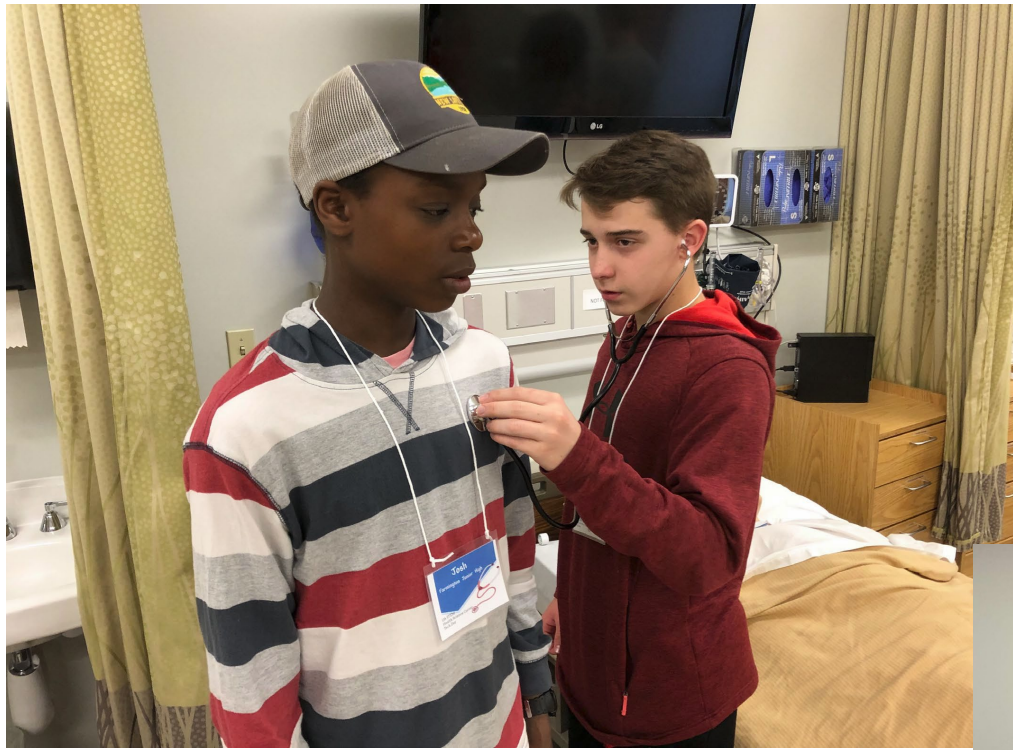
Since 2014, The STEM Centers have hosted 77 conferences across the state, serving more than 6500 girls.



Health Sciences Career Tech Days for 8th graders

The STEM Centers hosted 11 career tech days for approximately 750 eighth graders (boys and girls) to introduce them to a variety of fields of study and career paths in health sciences. The University of Arkansas for Medical Sciences, local hospitals and medical clinics, professionals from many health careers partnered with the STEM Coalition to collaborate on this one day, hands-on workshop for students.





Science Equipment Grants – Arkansas provides \$25 of every education license plate sold to purchase science equipment for 3rd-6th grade classrooms - legislation



Laptop Loan Program



Partners in this venture are ATT, Rock City Digital and eSCO Processing and Recycling Company. Since 2014 over 3000 laptops have been loaned out to organizations for \$1 each.

Community based programs such as museums, faith based organizations, Boys and Girls Clubs, Boys Scouts and Girl Scouts and Out-of-School Time (OST) programs as well as schools and universities can check out up to 130 laptops to provide coding or computer science workshops to youth.

Arkansas STEM Venture Academy

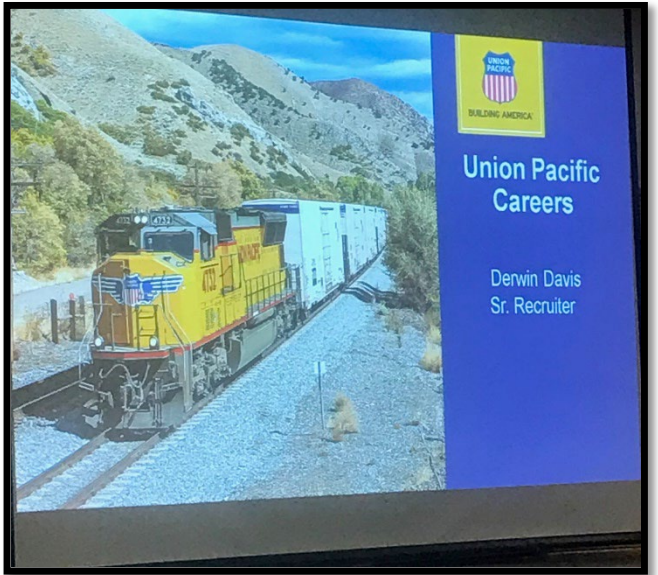


The STEM Venture Academy exposes 10th grade youth to middle skill level science, technology, engineering and mathematics (STEM) careers through engagement with companies providing important infrastructure services to their communities. 25 high school students visited 5 businesses over 5 weeks for hands-on experience.



**Electric Cooperatives
of Arkansas**
We Are Arkansas





The Arkansas STEM Coalition is the umbrella for the Arkansas STEM Ecosystem.

The Ecosystem includes –

- 12 STEM Centers
- 15 Educational Service Cooperatives
- Native American Indian Center
- Museums
- K-12 and Higher Education institutions
- Government institutions
- Community Organizations such as 4-H, Girl Scouts, Boys Clubs
- Libraries
- After School Organizations
- Home and Families
- Migrant Education Center



Other STEM Center and STEM Ecosystem Activities: Family STEM Nights

- Teacher professional development
- Project STRIVE
- Robotics Competitions
- Science Fairs
- Mathematics Competitions
- Science equipment check-out
- Assistance with family math and science nights



Forest Heights STEM Academy
Little Rock, AR
December 4, 2018



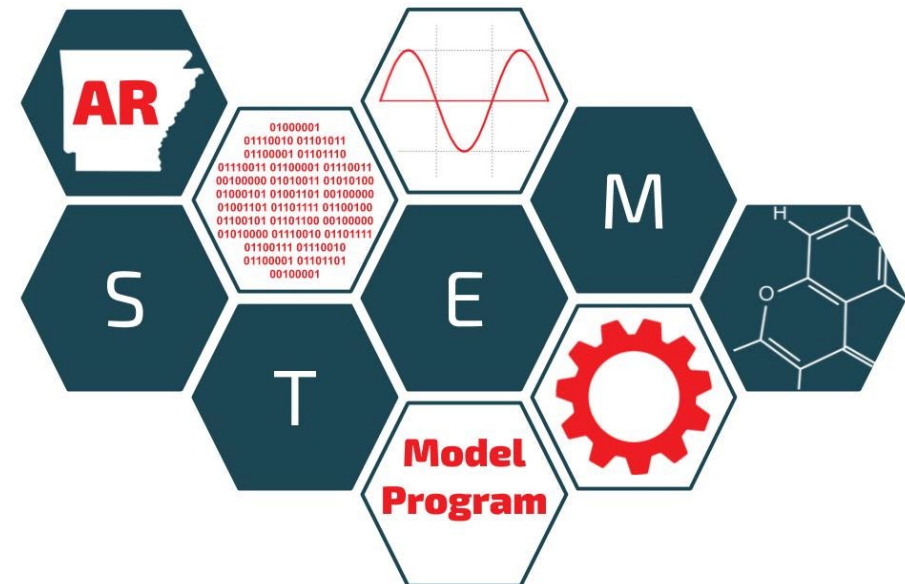
Maker Faire supports Tinkerers



Arkansas STEM Model Program – Developed by the Arkansas Department of Education

Goals of the AR STEM Model Program:

- Increase STEM Opportunities for Arkansas Students
- Recognize Model STEM Schools Across the State
- Develop and Strengthen Partnerships with Business, Industry, and Community
- Support Growth and Diversity of the AR STEM Teacher Pipeline



Closing Thoughts



- **Public/Private Partnerships are vital to the success of strong communities.**
- **Continue corporate sponsorships and funding**
- **Exposing kids early to STEM is essential**
- **STEM ideas and innovation will help fuel the 21st century economy**
- **STEM should not be taught “instead” of the arts and humanities but “with” the arts and humanities**

Arkansas



Coalition

SCIENCE ▪ TECHNOLOGY ▪ ENGINEERING ▪ MATH



PANELIST

Levi Patrick

Executive Director, Tulsa Regional STEM Alliance

Levi is a seventh generation Oklahoman with experience as a math teacher and instructional leader. He worked at the Oklahoma State Department of Education as the Director of Computer Science and Secondary Mathematics and as the Assistant Deputy Superintendent of Curriculum and Instruction. Levi, his wife, Roslyn, and 3-year-old daughter, Ruby, now live in Tulsa where the Tulsa Regional STEM Alliance aims to build broad, deep, and innovative STEM pathways for all students.



levi.patrick@tulsastem.org



TULSA REGIONAL STEM ALLIANCE

TI STEM EXCHANGE

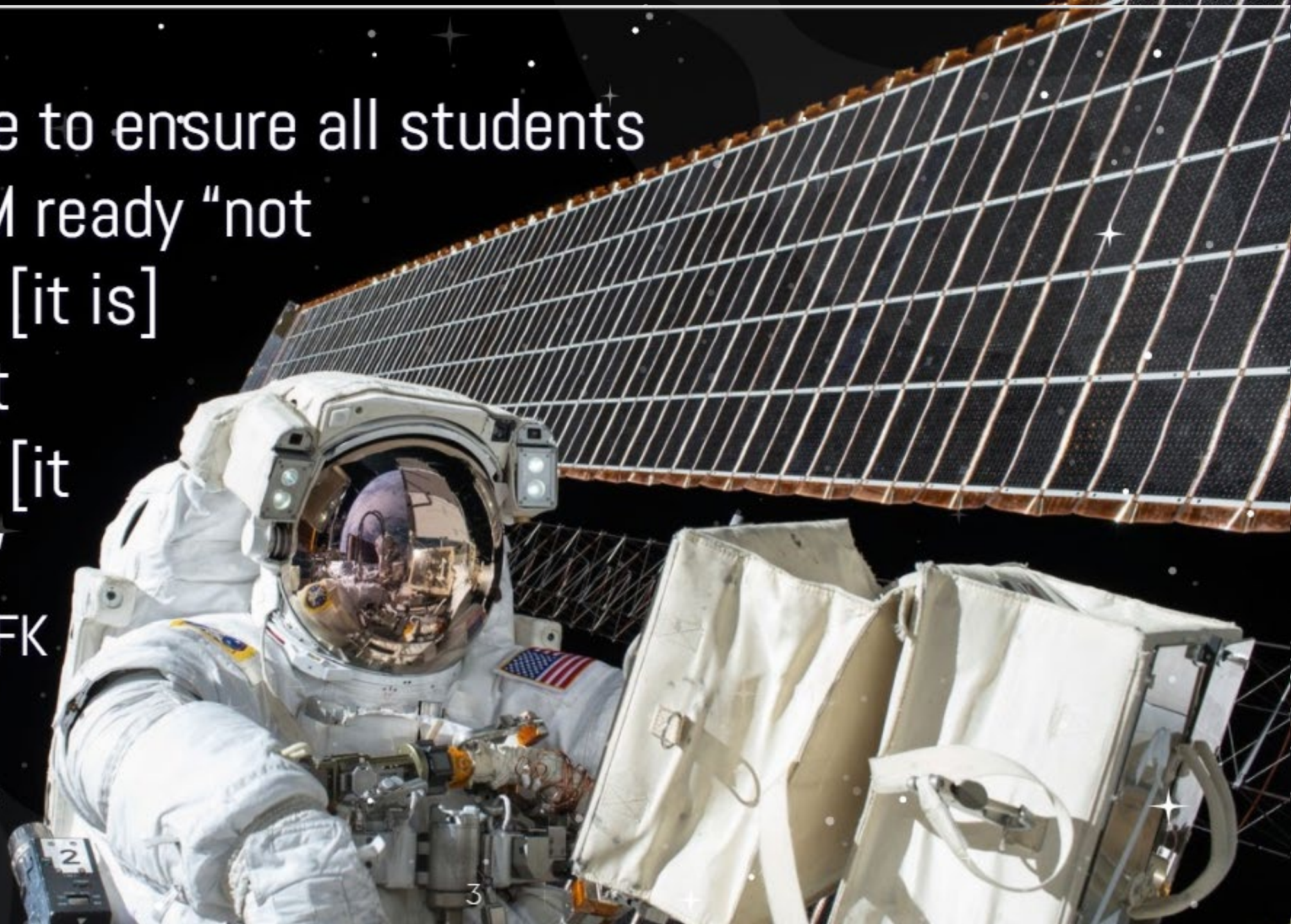




ALL STUDENTS STEM READY

Mission: Build broad, deep, and innovative STEM pathways for all students.

We strive to ensure all students
are STEM ready "not
because [it is]
easy, but
because [it
is] hard."
-Levi and JFK



FOCUS & GOALS

TRSA creates systemic capacity for equitable access to STEM.



STEM IS EVERYWHERE.

TRSA engages, equips, and empowers students and teachers to ensure opportunities to inspire and prepare students for their future are in every community.

★ STEM IS EVERYONE. ★

TRSA works with all partners to better understand STEM and the aspects of quality STEM experiences that change identities so that everyone sees themselves as a scientist, mathematician, or engineer.

ALL ARE WELCOME.

We pledge to continually pursue equity and inclusion across the STEM ecosystem and the broader community by participating in and leading discussions, sharing resources, promoting diverse viewpoints and contributions, and leading by example.

**We are all just stars
that have people
names.
-Nikita Gill**





TULSA REGIONAL STEM ALLIANCE

TULSASTEM.ORG





PANELIST

fcullars@csraresa.org

Felicia Cullars

STEM Coordinator, Georgia Department of Education

Felicia has been an educator for over 17 years, with her primary areas of leadership in the disciplines of mathematics and STEM education. As the STEM Coordinator at the Georgia Department of Education, she advocates for high-quality STEM/STEAM programs in Georgia schools. Felicia also works with the Georgia Career Technical and Agricultural Education Division to promote connection between teachers and the workforce as well as nontraditional career awareness.

     @TICalculators



Why STEM/ STEAM?

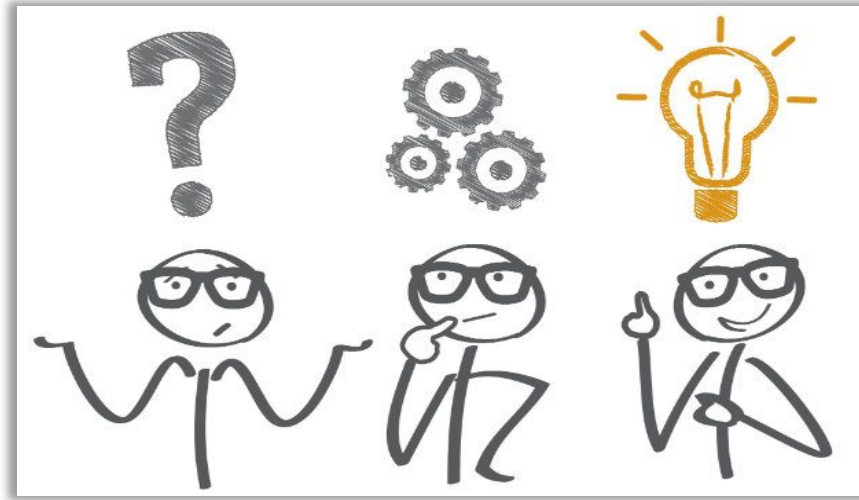
STEM/STEAM education is an economic imperative for Georgia in response to business/industry in the state

**In Georgia between 2017 and 2027
STEM jobs will have grown by 13%
Non-STEM jobs will have grown by 8%**

**Median Earnings in STEM Jobs=\$36.89/hr
Median Earnings in non-STEM Jobs=\$18.14/hr**

<https://vitalsigns.ecs.org/state/georgia/demand#fields-growing>

It's not only about STEM/ STEAM Jobs. It's about the STEM/ STEAM in a job.



Empowering students with skills that will enable them to solve tomorrow's challenges regardless of the field they are working in.

“Positive learning can only take place in a positive culture. A healthy school culture will affect more student and teacher success than any other reform or school improvement effort currently being employed.”

-Gary Phillips

STEM/STEAM is for All Students



PROJECT AND PROBLEM-
BASED LEARNING



INTEGRATED MATH,
SCIENCE, CTAE, AND FOR
STEAM, FINE ARTS
INSTRUCTION



STRONG BUSINESS,
COLLEGE, COMMUNITY
PARTNERS

- **21st Century Thinking Skills:** STEM and STEAM schools support student growth by promoting the 21st Century Thinking Skills of Communication, Creativity, Critical Thinking and Collaboration
- **Real World Problem Solving:** STEM and STEAM adds relevance to learning. Career exposure through real-world problem solving increases student engagement.
- **Arts and Design:** The arts teach creative problem solving, innovation, and empathy, connect to students' interests and learning styles, and prepare students for future careers in the growing creative economy.

Georgia STEM/STEAM and CTAE



Georgia STEM/ STEAM and CTAE



ARE



CTSOs play an integral role in Career, Technical, and Agricultural Education (CTAE).

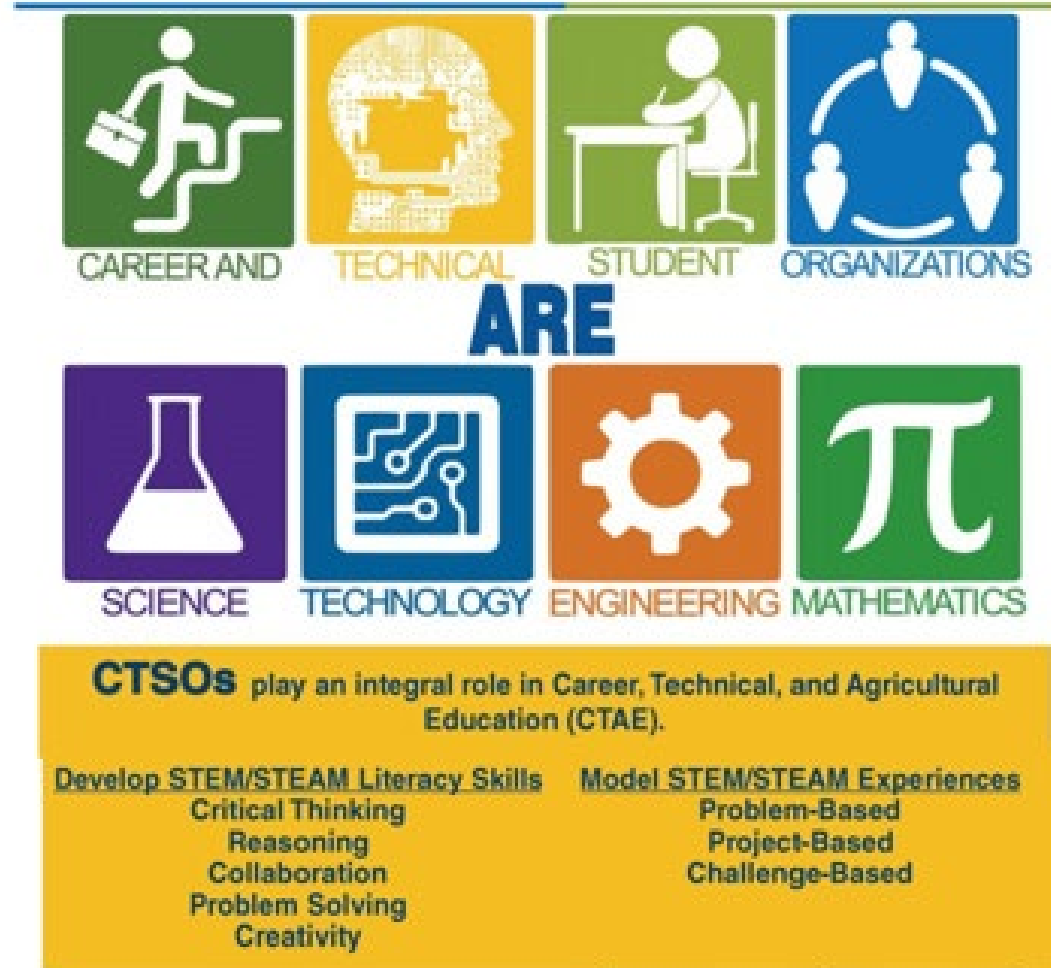
Develop STEM/STEAM Literacy Skills

Critical Thinking
Reasoning
Collaboration
Problem Solving
Creativity

Model STEM/STEAM Experiences

Problem-Based
Project-Based
Challenge-Based

Georgia STEM/STEAM and CTAE



STEM/STEAM Georgia Partnership Involvement Levels



Support Partner

Partners are beginning to work with the school to help define and develop a STEM culture.



Interactive Partner

Partners assist with:

- developing the curriculum
- professional learning
- and other aspects of the STEM/ STEAM program

Advocate partner

Partners are an integral part of the STEM/ STEAM program and are interwoven into:

- the school day, faculty professional learning
- development of curriculum
- and STEM/ STEAM activities

The partnership is purposeful and mutually beneficial.

Locally Driven Project Based Learning



Field Studies Lab



Apple Orchard Research

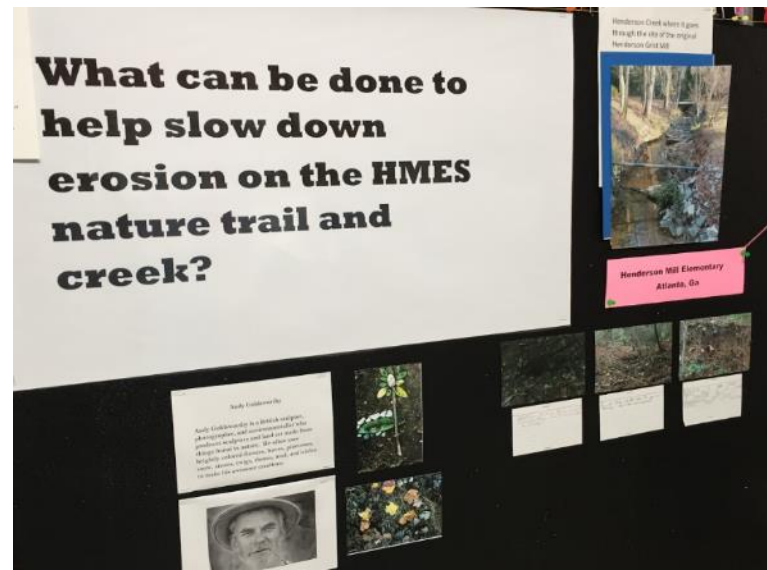


Sea Level Sensors

<https://www.wtoc.com/2020/02/12/savannah-students-build-tidal-sensors-collect-data-across-county/>



River Water Quality



Erosion



Sustainable Agriculture



Film





It Takes a Village

“Flipped Panel” Breakout Room Discussions





Breakout Group Discussions

Each breakout group will discuss ideas around one of these themes:

1. Building industry and community partners
2. Cross-grade comprehensive STEM programming
3. College and career preparedness

When we return to the large group,

- » A representative from each breakout group will share a 2-3 sentence summary of the discussion
- » Moderator and panelists will engage in conversation



Breakout Group Discussions - Debrief

1. Building Industry & Community Partners
 - What considerations are necessary to ensure that industry partnerships last beyond a single event?
 - How do internships and externships support STEM programming?
 - How might one find, establish, and leverage industry partnerships?
2. Cross-Grade-Level Comprehensive STEM programming
 - What resources to teachers have or need to consider STEM programming for younger students, particularly in grades PK-6?
 - How might one ensure that STEM programming aligns to grade-level standards in the academic content areas?
 - What strategies support communication between core subject teachers in order to fully integrate STEM lessons?
3. College and Career Preparedness
 - What does “workforce preparedness” mean in your community? What do students need to be successful in the workforce after high school graduation?
 - In what ways to “soft skills” (problem solving, communication, collaboration, perseverance, creativity, etc.) contribute to students’ academic success?
 - What ideas can you share for increasing the number of teachers in the STEM workforce?



TI Education Technology is transforming the way teachers teach and students learn STEM (science, technology, engineering and mathematics) subjects.

Vince O'Connell

Director of School Partnerships | Texas Instruments

voconnell@ti.com



TI STEM Exchange

Justice-Centered STEM Education to address pressing societal challenges using the case of the COVID-19 pandemic

December 2, 2021 7:00 – 8:30 pm ET

Registration available soon at

<https://education.ti.com/en/resources/ti-stem-exchange>



TI STEM Exchange

Thank you!

