The Definition of STEM and Why It Matters: Connecting Education and Workforce

LA STEM
REGENTS
SCIENCE · TECHNOLOGY
ENGINEERING · MATH

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Changing Definition of STEM Over the Years

What is STEM to me?

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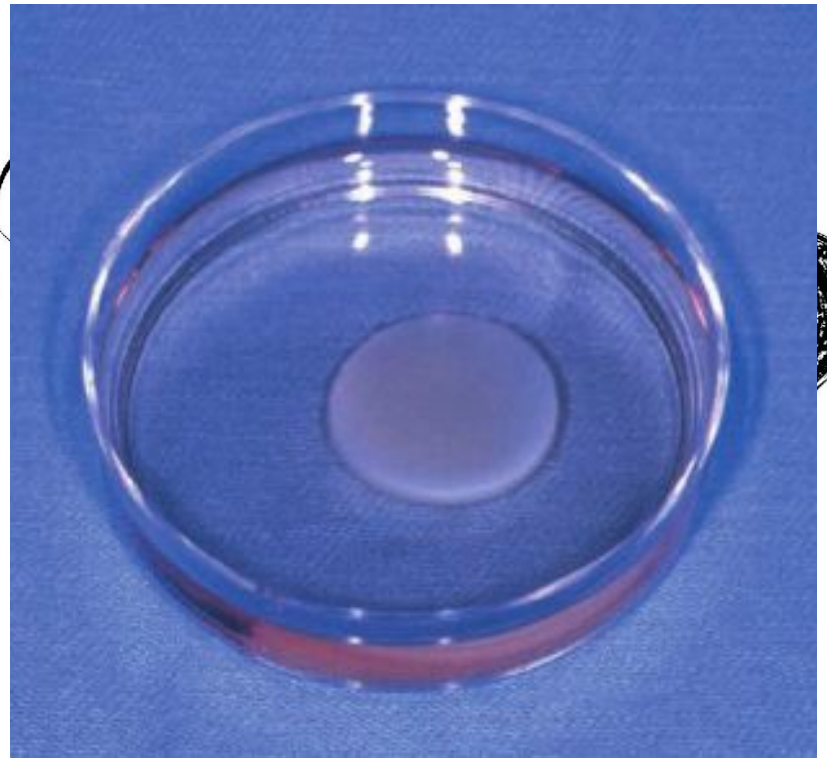
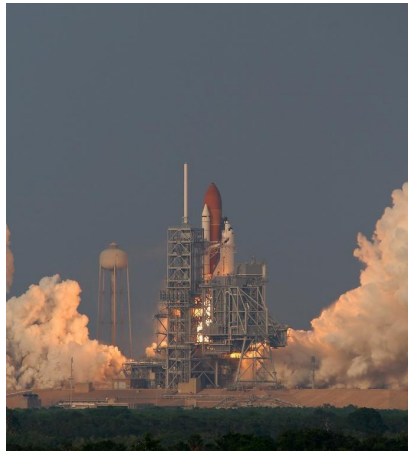
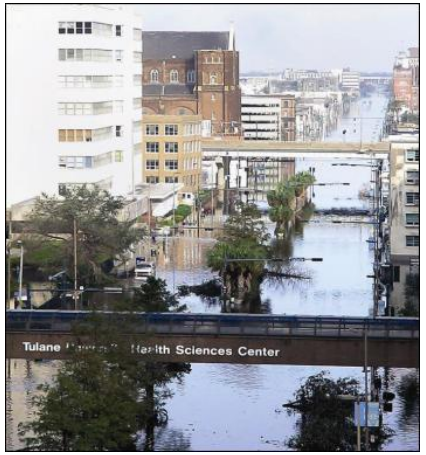


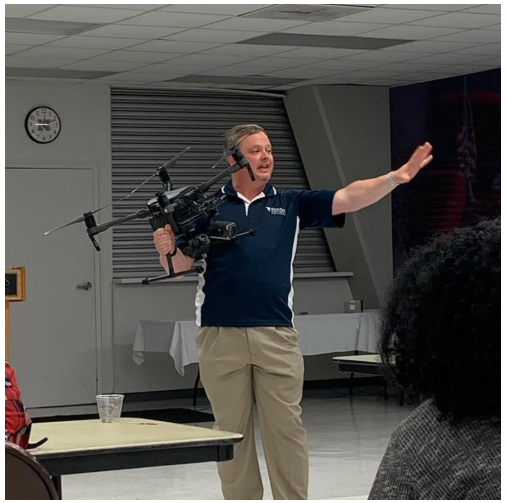
Best Laid Plans… What to Do Next?

Changing Definition of STEM Over the Years

From Rural to Molecular Geneticist to STEM Advocate….
What do you do with a BS or MS in Biology? Earn a PhD…

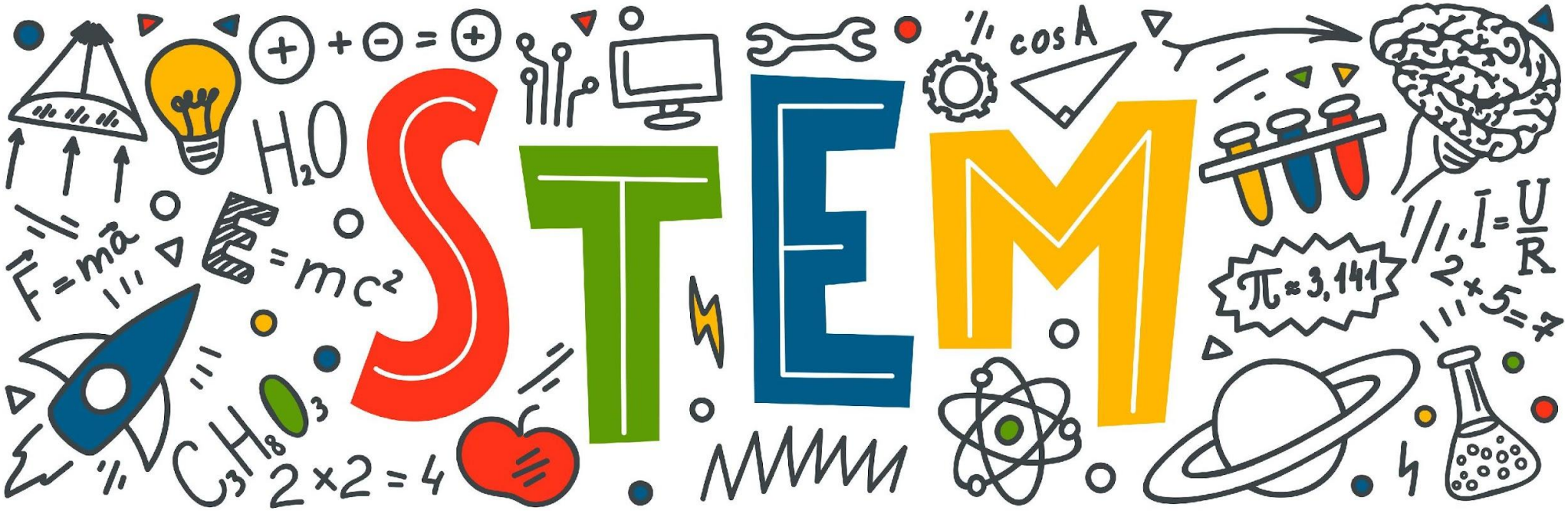






Changing Definition of STEM Over the Years

What is Your



Story?

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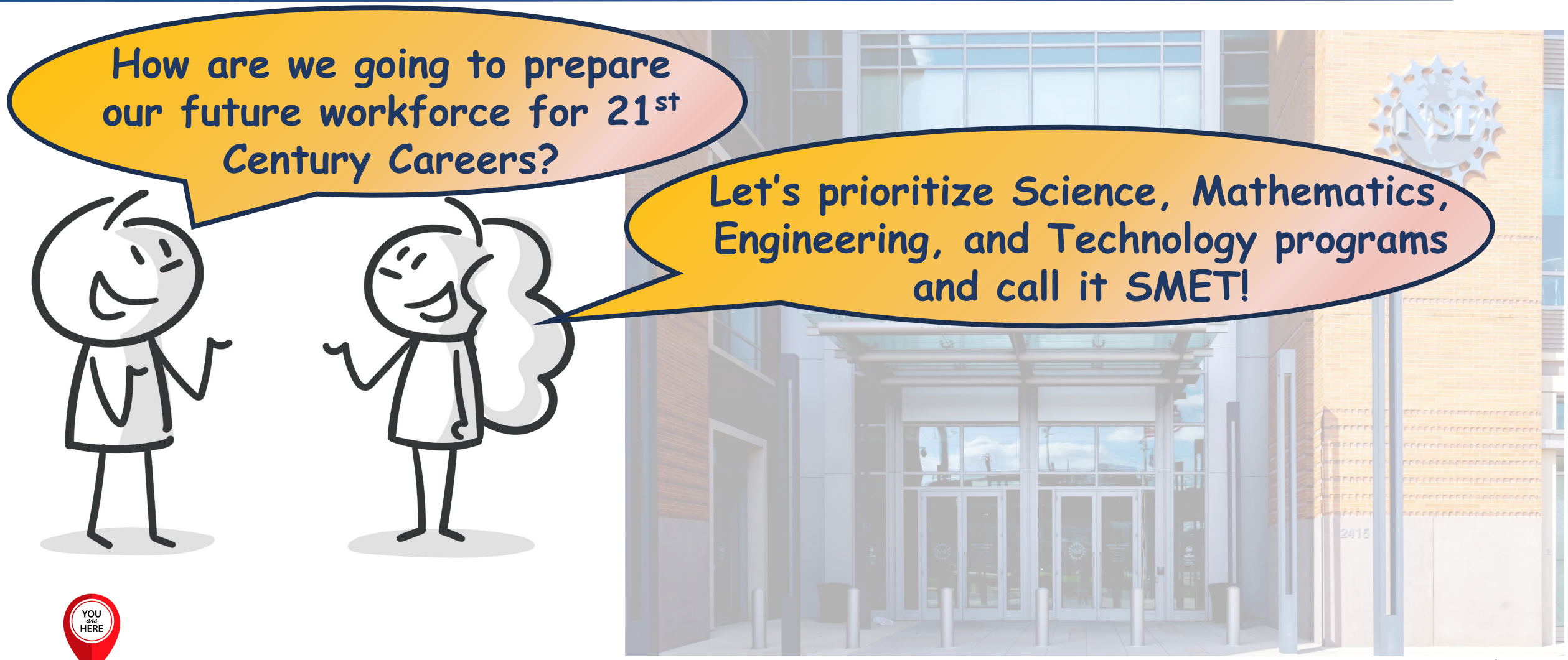

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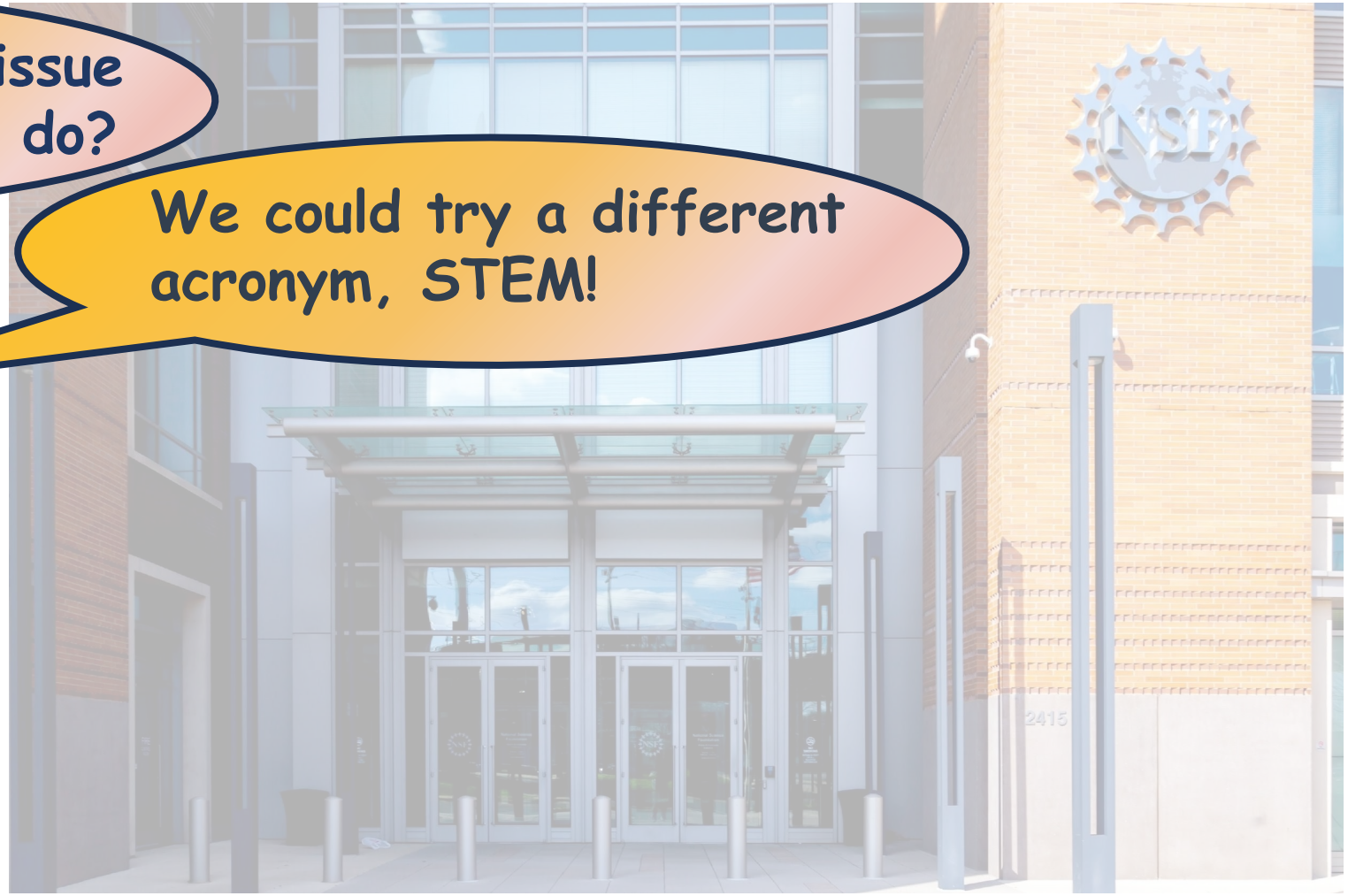
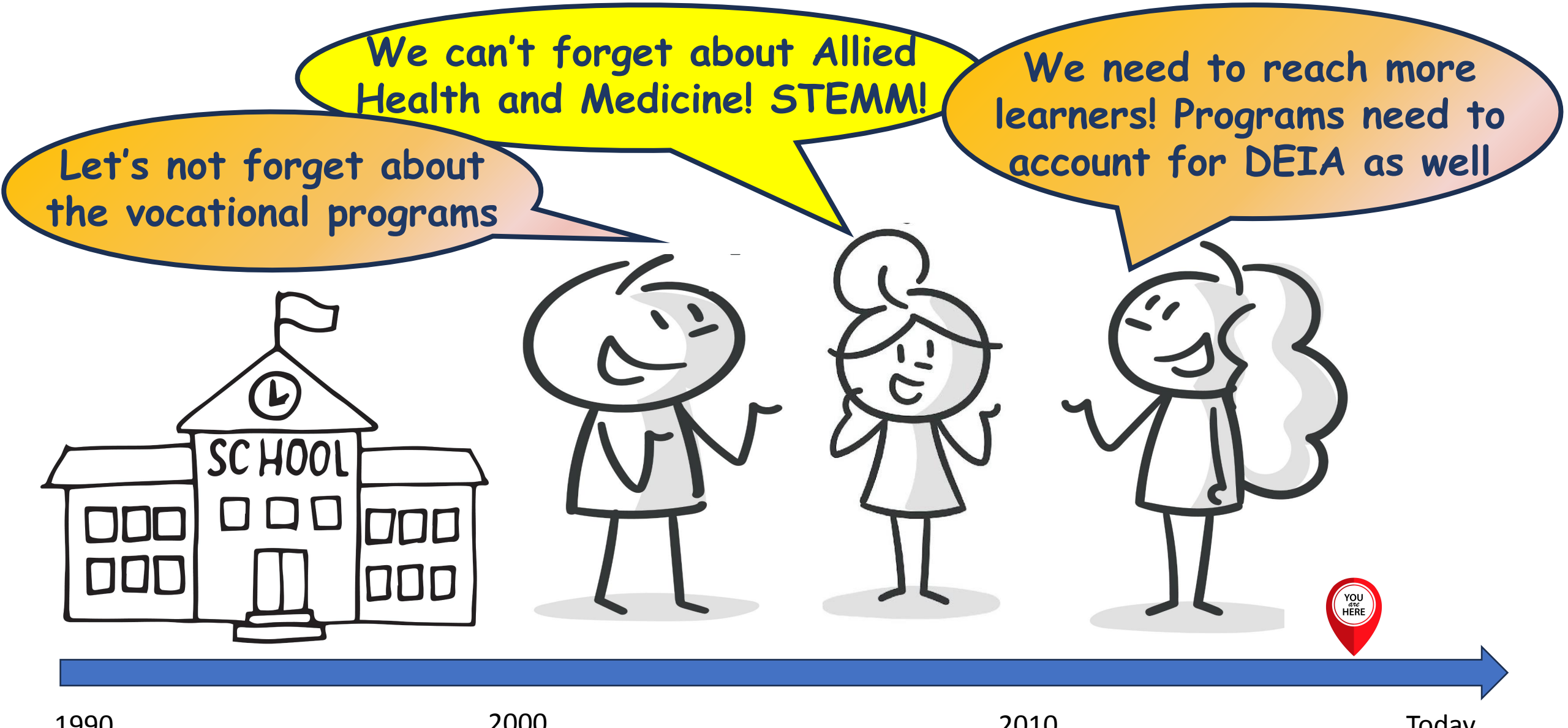


YOU are HERE

1990 2000 2010 Today

Changing Definition of STEM Over the Years



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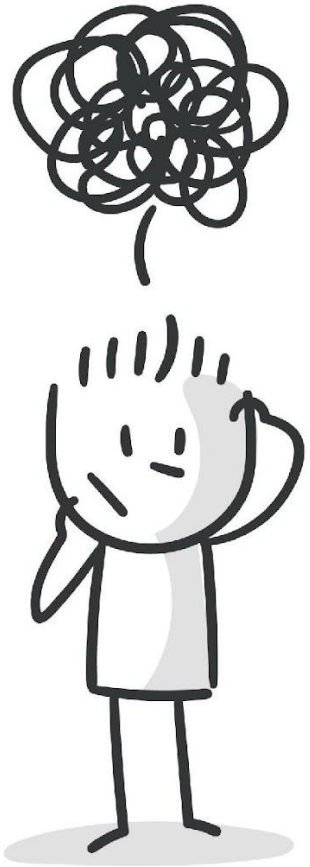
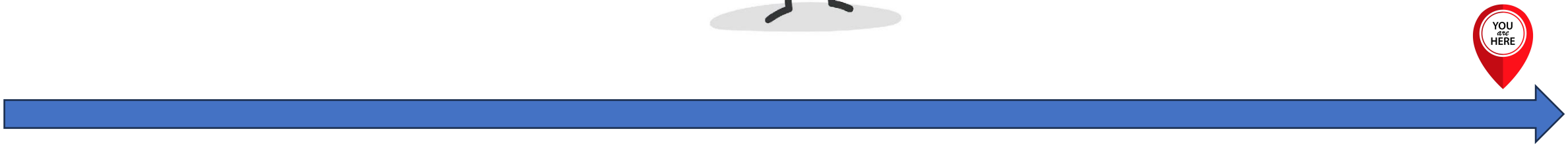
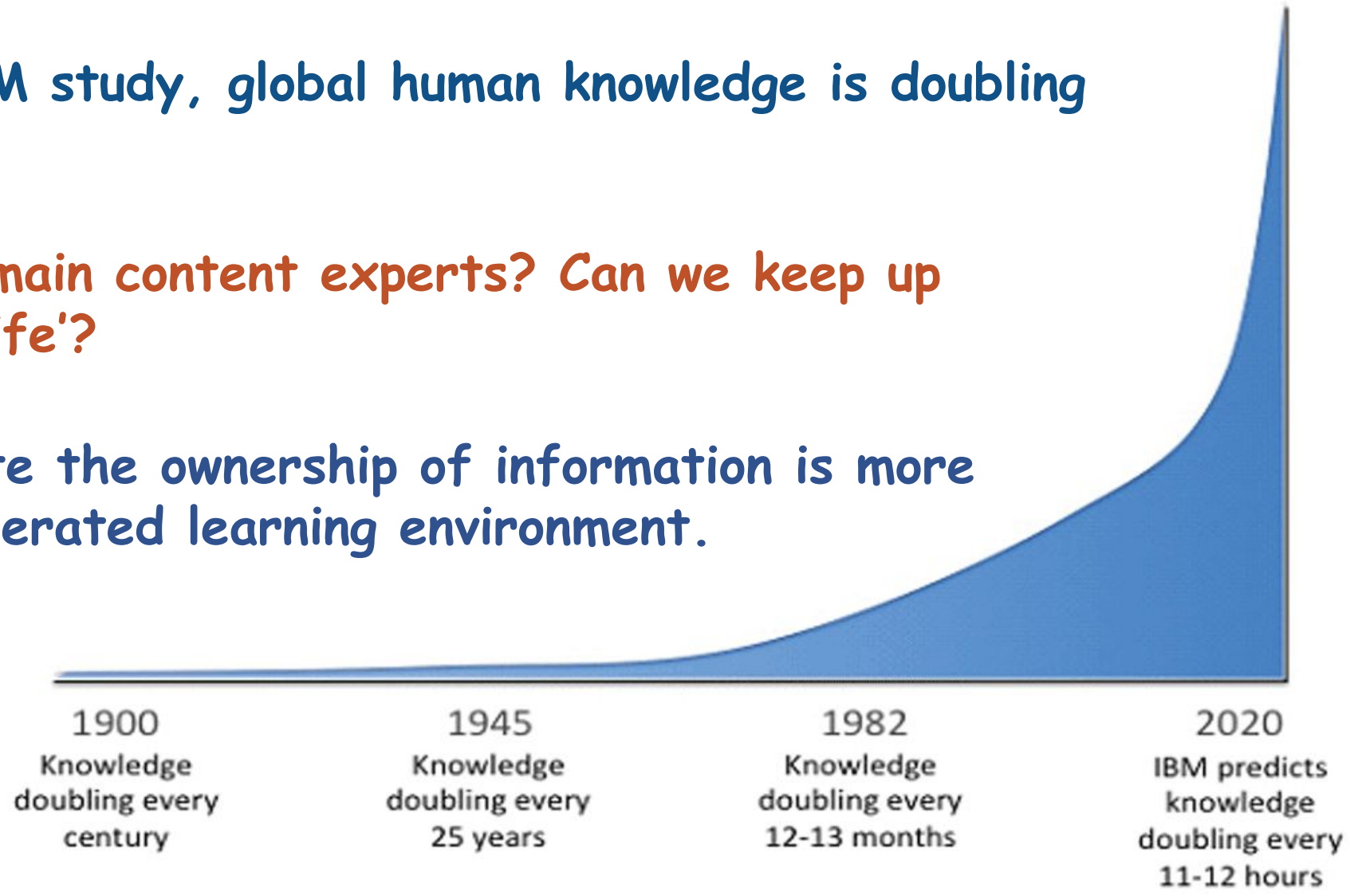




Education is Constantly Evolving

- According to 2020 IBM study, global human knowledge is doubling every 11-12 hours.
- How can educators remain content experts? Can we keep up with 'knowledge half-life'?
- The ability to facilitate the ownership of information is more important in this accelerated learning environment.



Where Do You Begin?

- A 21st Century classroom will include **interactive learning**, **higher level thinking skills**, and **student engagement**
- ***Interactive learning does not always mean technology alone.***
- Learning must be an interaction between the educator, the information, and the audience.
- Buzz words are simply tools (chalkboard, pencil)
- Connecting information and outcomes is critical to growing our future workforce.

(AI Generated Image)

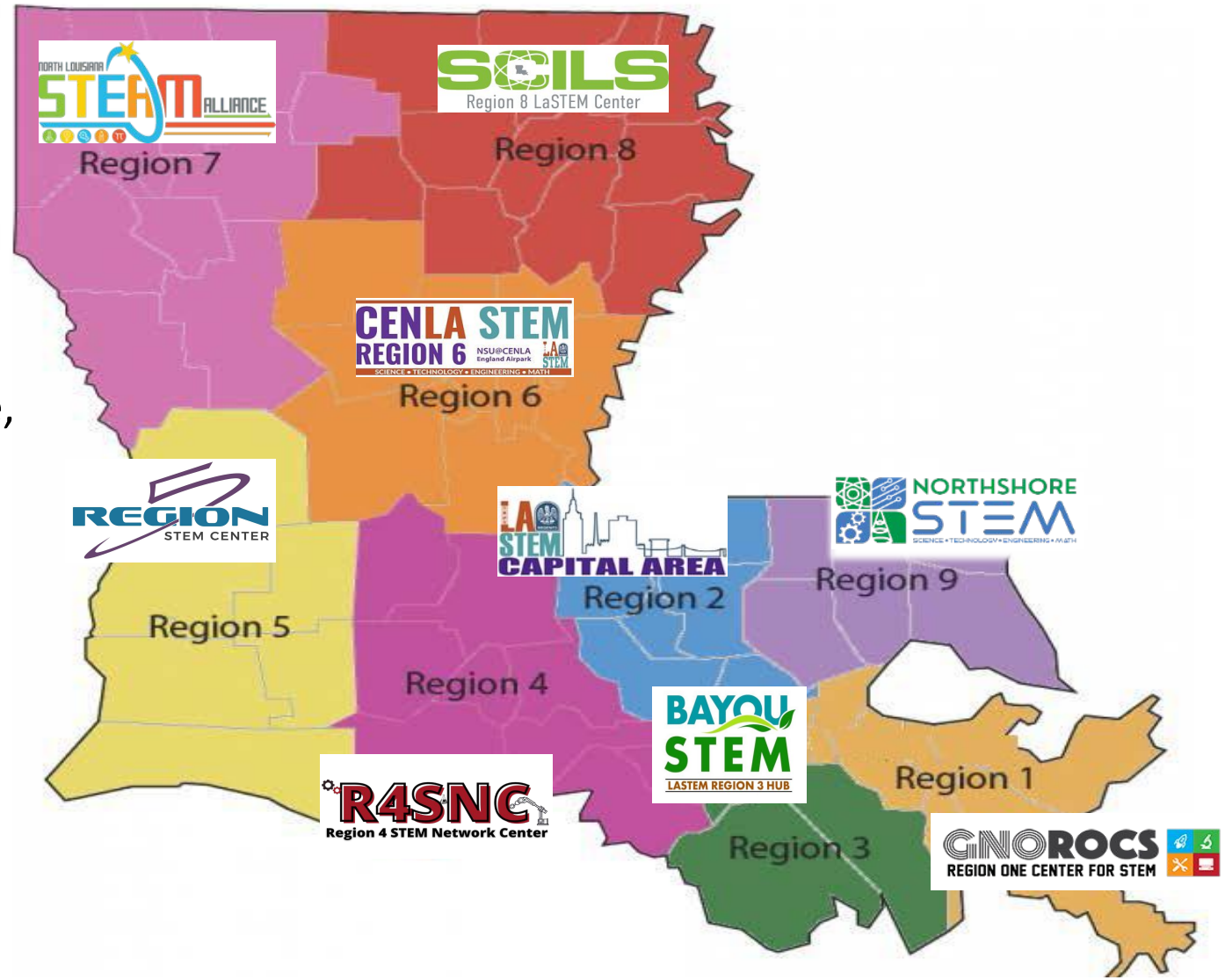
What is LASTEM?

- **LASTEM: Louisiana's STEM Network**
  - Founded by State Statute in 2017
  - 29 Member Council

Nine Regional STEM Centers

- **K-12**: Calcasieu Parish School Board
- **Higher Education**: LSU, LA Tech, NW State, Fletcher CC, Southeastern, Univ LA-Lafayette)
- **Workforce**: SciPort Discovery Museum, GNOinc (Economic Development Organization)

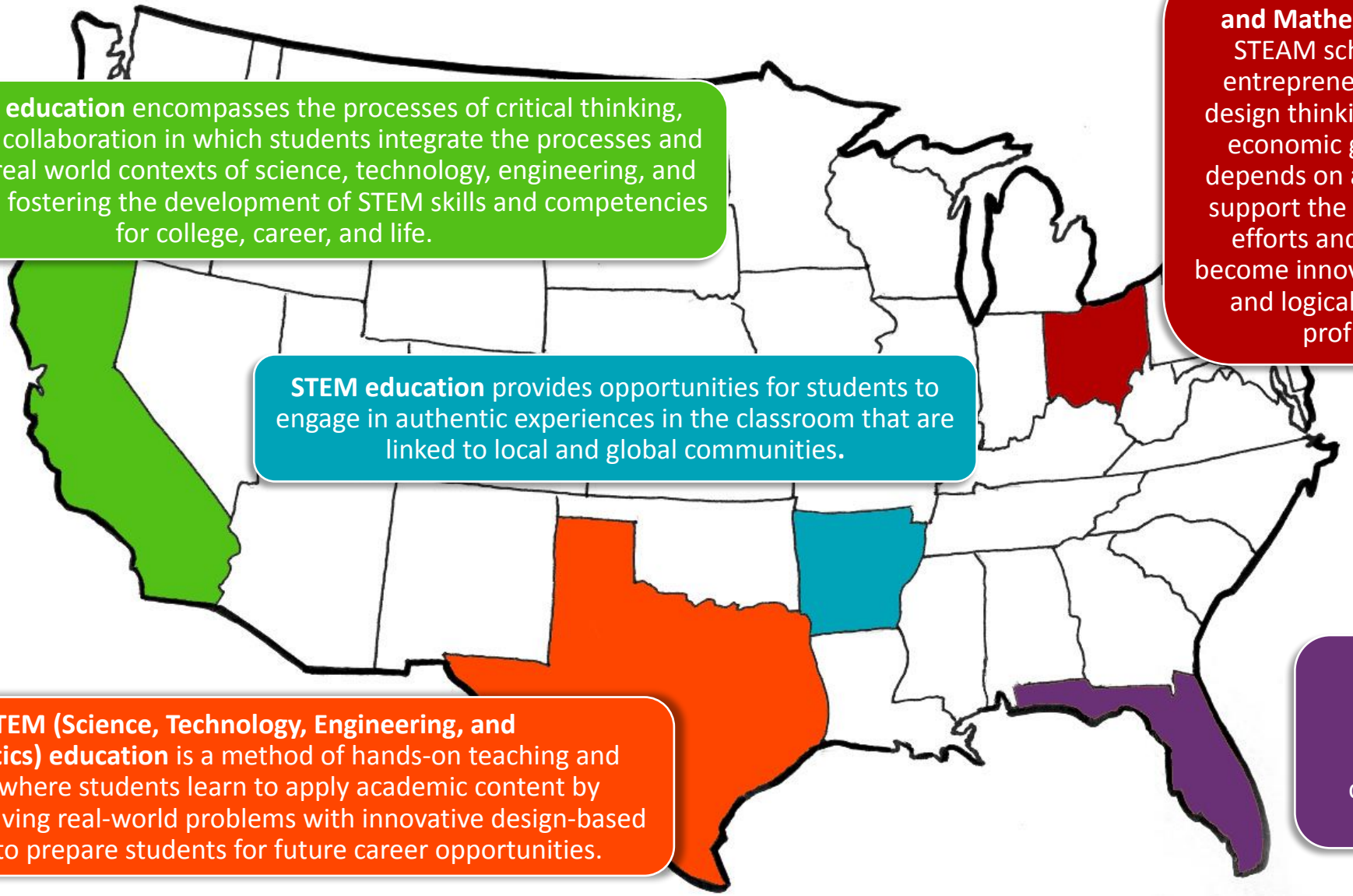
- **2023-24 State Funding $3M**
  - 20-21: $1M, 21-22: $2M, 22-23: $3M



Benefits of the LaSTEM Regional Center Network

- Healthy ecosystems provide opportunities for learners of all backgrounds and education levels
- Support for classrooms as unique as the communities they serve
- ‘Connected Autonomy’ allows for dissemination of information and opportunities across the state
- Ability to introduce innovative and emerging 21st century resources throughout LA

The Definition of STEM Across America



K–12 STEM education encompasses the processes of critical thinking, analysis, and collaboration in which students integrate the processes and concepts in real world contexts of science, technology, engineering, and mathematics, fostering the development of STEM skills and competencies for college, career, and life.

STEM – Science, Technology, Engineering and Mathematics. The goal of STEM and STEAM schools is to foster intellectual, entrepreneurial and technical talent and design thinking. This is vital to Ohio's future economic growth and prosperity, which depends on an aligned education system to support the state's economic development efforts and that helps all Ohio students become innovators and inventors, self-reliant and logical thinkers and technologically proficient problem solvers.

STEM education provides opportunities for students to engage in authentic experiences in the classroom that are linked to local and global communities.

STEM (Science, Technology, Engineering, and Mathematics) education is a method of hands-on teaching and learning where students learn to apply academic content by creatively solving real-world problems with innovative design-based thinking to prepare students for future career opportunities.

STEM education in Florida is focused on generating new ideas, concepts and theories that address real-world challenges and spur scientific breakthroughs.

Louisiana Definition of STEM

STEM education, as defined by the Louisiana STEM Advisory Council (LASTEM), is an integrated approach to learning about scientific, technological, engineering, and mathematical concepts and processes as well as their application in careers and in life.

STEM education cultivates critical thinking, analysis, and collaboration skills applicable in real-world contexts.

It emphasizes dynamic, hands-on, experiential learning across the STEM spectrum, enabling students to creatively solve real-world problems through innovative design thinking.

Skills developed through STEM prepare learners for success by providing authentic experiences relevant to 21st-century life and work.

To be adopted 12/23

STEM, STEAM, STEMM, STREAM, SMET, STEMIE, STEEM, or any other combination is now encapsulated under this definition.

Defining Roles Along the Pathway: K-12

LASTEM Roles

- Identify Education Paths
- Connect Fast Start/Jump Start
- Summer Enrichment (camps)
- Field Trips (in person/virtual)
- STEM Festivals (community)
- Teacher PD
- Develop/Identify Curriculum Support

Industry Roles

- Identify Career Paths
- Participate in Campus Visits
- Provide Scholarships
- Career Shadowing
- Volunteer at STEM events
- $$$ For Programming

Defining Roles Along the Pathway: Higher Ed

LASTEM Roles

- Identify Paths To Workforce

- Identify Industry-aligned Programs (AS, BS, Certs, MS)

- Incorporate Work-based Activities In Curriculum

- Support 2+2 Agreements

Industry Roles

- Identify Workforce Demand

- Align Industry-Based Creds

- Present Content in Classroom

- Participate in Advisory Boards

- Provide Work-Based Learning Opportunities (Internships)

Defining Roles Along the Pathway: Industry

LASTEM Roles

- Advocate Social Media Platforms, Newsletters, etc.

- Participate In Education-Career Events

- Generate Resources

- Invite Alumni To Events

Industry Roles

- Get Involved! Volunteer!

- Advocate as Alumuni

- Showcase the Industry at Community Events

- Industry Awareness is Key

NASA Astro Camp as an Example

Michoud Assembly Facility (New Orleans, LA)

- 43 acres under a single roof
- 4200 federal, state, academic, and technology-based industry employees
- Manufacture and assembly of large aerospace systems/external fuel tank

- Dept. of Agriculture, Dept. of Defense, Boeing, Ochsner, US Coast Guard Integrated Support Command, LM Wind Power, and Lockheed Martin Corporation call Michoud home.

- University of New Orleans
  - National Center for Advanced Manufacturing

Stennis Space Center (Pearlington, MS)

- 2nd largest NASA center, 13,800 acres
- ~5000 (40 agencies) federal, state, academic, private, and technology-based industry employees
- Home to corporations/agencies such as NOAA, Lockheed Martin, Aerojet Rocketdyne, and Dept. of Defense.

NASA Astro Camp as an Example

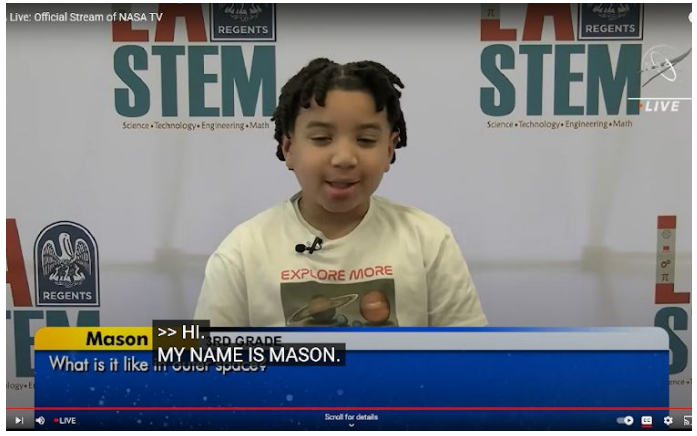
- **A total of 8358 students attended LASTEM supported summer camps!**
- **22 different themed camps**

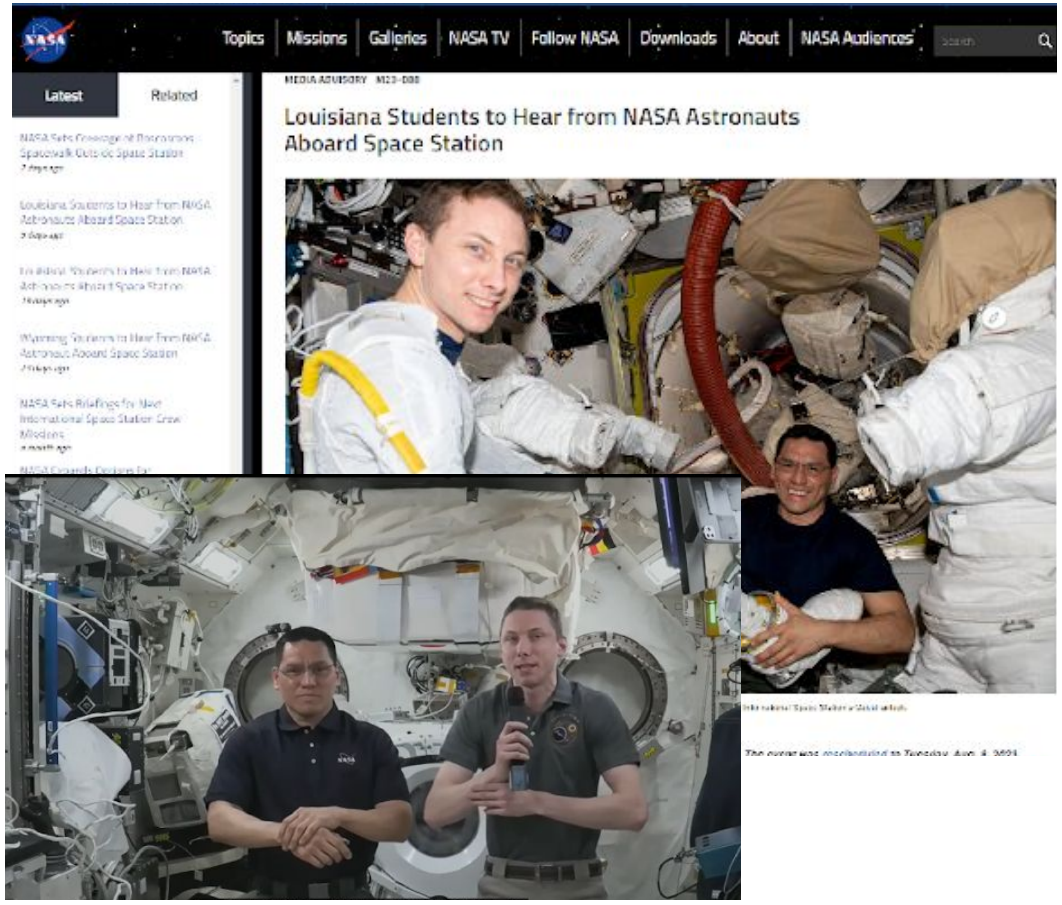
- **NASA Astro Camps**- over 3875 campers in 19 locations throughout LA
  - Over 52 teachers trained
- **Shell Energy Venture Camps**- 612 campers, 11 locations, 43 teachers
- **Terrebonne Aquatic Clinic**- attended by 800 students
- **Urban Ecology**- 370 students, 6 locations and 14 teachers trained
- **STEM Olympics**- 125 students attended
- **CEEF AI Energy Camps**- 211 students, 5 locations, 14 teachers trained

2022-23 Summer Camps (#SummerOfLASTEM)

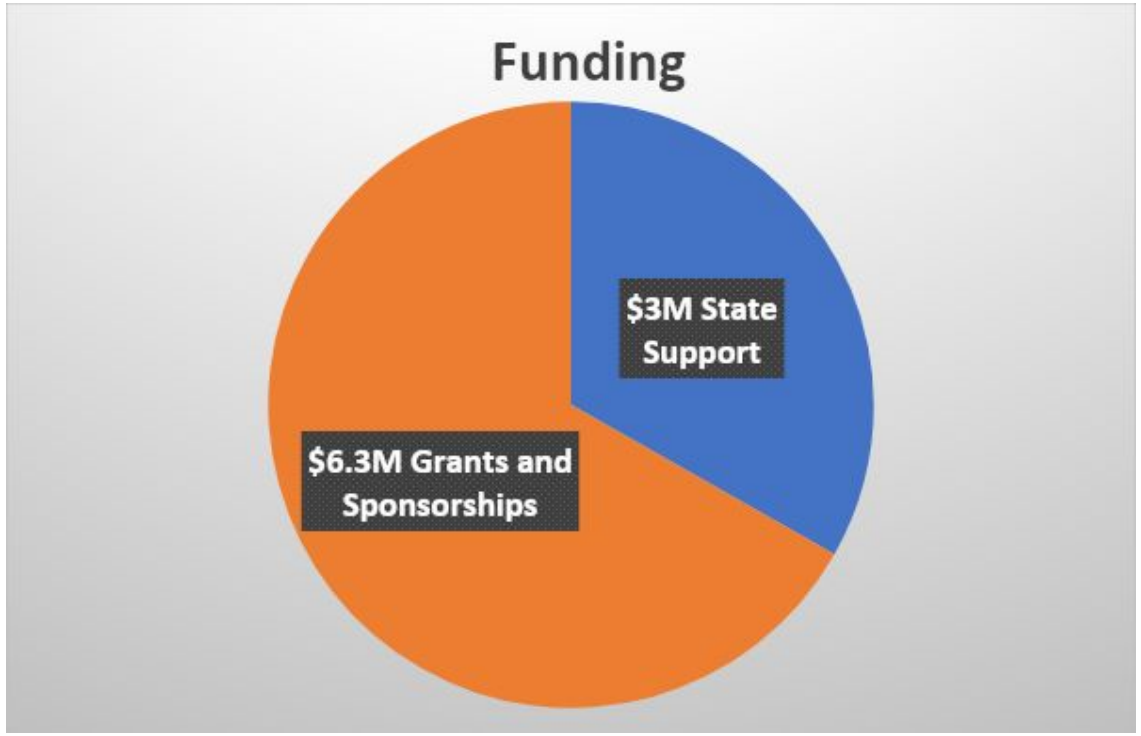
First ever downlink with ISS in Louisiana!

- Collaboration between LASPACE and LASTEM to bring First downlink to LA
- Supported by Region 5 STEM Center in Lake Charles, LA
- Astronauts Frank Rubio and Woody Hoburg spoke live to students





Funding and Grants



- $3.4M Computer Science Training (LDOE/LASTEM)
- $1M Federal Appropriation (BoR/SCILS)
- $750K Robonation (DODSTEM Grant)
- $300K for classroom supplies (LDOE)
- $170k Chevron (GNOrocs/BayouSTEM)
- $175k Americorps (Northshore STEM)
- $75K Drax Energy (SCILS, Region 8)
- $60k NASA Space Act Grants (Capital Area STEM/BoR)
- $65k Shell (BayouSTEM)
- $25k Centerpoint Energy (SciPort)
- $12.5K Verizon (SciPort)

Other Education-Workforce Highlights:

- Consumer Energy Education Foundation- 2022 World Oil 'Best Outreach Program' (AI Energy Camp)
- Shell Oil- 2023 World Oil 'Best Outreach Program' (Energy Camp)
- Coastal Wetlands Planning, Protection, and Restoration Authority- Caminada Headlands VR Field Trip Over 1.5M hits
- Year 3 of Robonation Sea-Perch DODSTEM Grant

LASTEM Partners