

2023 **STEM Summit Report**

Growing STEM Learning Across the Big Sky



Sponsors and Organizers

The 2023 Montana STEM Summit was brought to you by the Montana Afterschool Alliance and MSU Science Math Resource Center with members of the planning committee from ExplorationWorks!, Helena SACC, MAPS Media Institute, Montana Afterschool Alliance, and UM spectrUM Discovery Area.

With support from Million Girls Moonshot, Mott Foundation, Montana NSF EPSCoR, EdChoice, GEARUP, Overdeck Family Foundation, and Wildfire Defense Systems, Inc.

A big thank you to summit attendees, Montana STEM programs, and the youth presenters who made this event possible.

A special thank you to:
Afterschool Alliance
First Lady of Montana, Susan Gianforte
Montana University System
National Girls Collaborative Project
Office of Public Instruction
Rep. Laurie Bishop-House District 60
Rep. Mike Yakawich-House District 51
Rep. Marty Malone-House District 59
US Senator Steve Daines's Office
US Senator Jon Tester's Office

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Welcome

The Montana STEM Summit brings together representatives from education, business, afterschool, government, industry, and nonprofits, along with other engaged citizens, to discuss and showcase STEM (Science, Technology, Engineering, and Math) opportunities from across the state.

The 2023 Montana STEM Summit built upon previous summits, the first of which was held in August of 2017 at Montana State University (MSU) as a collaboration between the Montana Afterschool Alliance (MTAA) and the MSU Science Math Resource Center. The event originated when MTAA was awarded a STEM Next grant from the Charles Stewart Mott Foundation in order to promote collaborations and statewide partnerships for innovative STEM efforts. Summit organizers, attendees and other stakeholders set priorities that were then used to guide programming and partnerships in Montana, including setting the agenda and goals for the statewide STEM Summits in 2019, 2022 and 2023.

The priorities identified at the first STEM Summit included:

- Create a statewide centralized STEM effort for networking and resources
- Build a bridge between K-12 STEM education/out-of-school pipeline and workforce and innovation
- Increase access and affordability for afterschool/out-of-school STEM programming
- Transform STEM into STEAM (with art)
- Focus on K-12 curriculum

These priorities have continued to guide future events, including Summer 2019, when the STEM Summit was again held at MSU. The 2021 biennial Summit was not held due to COVID-19 but was hosted virtually in Spring 2022. This report contains an overview of the 2023 Montana STEM Summit, which was hosted in Helena, Montana on April 13, 2023.

Many incredible organizations and individuals made the 2023 Montana STEM Summit possible. Thank you for your interest in supporting STEM learning opportunities in Montana.

Agenda

The 2023 Montana STEM Summit included:



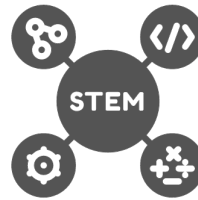
Workshop

A workshop for providers focused on STEM role models.



Work Session

An interactive conversation on the current state of STEM in Montana.



Open House

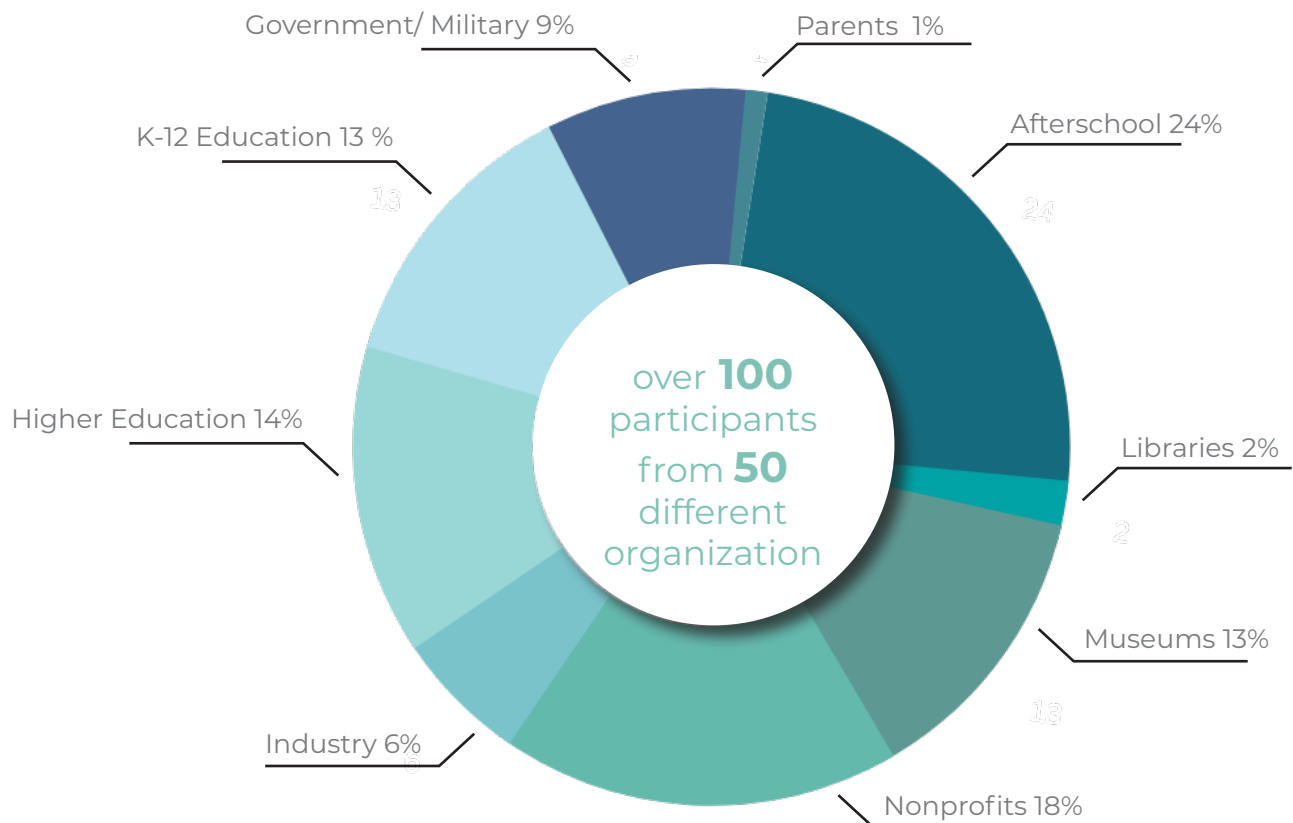
An open house of exhibits and activities, including robotics, VR, bookmobiles and more.



Showcase

A student showcase celebrating STEM learning opportunities from around the state.

Who Attended?



Source: based on attendance data for April 13, 2023

Provider Workshop

STEM Role Models

The 2023 STEM Summit kicked off with a workshop featuring Karen Peterson, Chief Executive Officer, and Brenda Britsch, Senior Research Scientist, of the National Girls Collaborative Project. Their attendance was in support of the Million Girls Moonshot initiative of the STEM Next Opportunity Fund.

As one of the most geographically spread-out states, the opportunity for providers and educators to connect and share about their experiences and resources was invaluable. Participants were introduced to research-based strategies and resources for planning a role model experience, including how to recruit and connect with diverse role models. The workshop concluded with a conversation with Susan Gianforte, First Lady of Montana, whose background is in mechanical engineering.



Karen Peterson, Chief Executive Officer
National Girls Collaborative Project



STEM Role Model (Mechanical Engineering)
Susan Gianforte, First Lady of Montana

“ Getting to know the resources and connections within the MT STEM network was incredibly beneficial. ”
-Summit Participant



Brenda Britsch, Senior Research Scientist
National Girls Collaborative Project

Why STEM Role Models?

Engagement with diverse STEM role models is a key strategy to encourage youth's identification with and participation in STEM by:

- breaking down and dispelling stereotypes about who belongs in STEM
- making STEM personally and culturally relevant
- broadening the notion of STEM fields and journeys
- showing how STEM is collaborative and social
- helping youth develop positive STEM identities
- increasing interest and participation in STEM

Latina, Black, and Indigenous women represent less than 10% of the STEM workforce overall. National Center for Science and Engineering Statistics, 2023



Learn more

- Visit National Girls Collaborative Project at ngcproject.org
- Monthly NGCP newsletter: ngcproject.org/our-newsletters
- Montana Girls STEM Collaborative: ngcproject.org/about/collaboratives/montana-girls-stem-collaborative



STEM Role models resources

- Million Girls Moonshot: www.milliongirlsmoonshot.org
- Access to STEM Framework: https://stemnext.wpenginepowered.com/wp-content/uploads/2022/07/Access-to-Stem-A-Framework_Final-11-x-8.5-in.pdf
- IF/THEN Collection: www.ifthenshecan.org/ and <https://www.ifthencollection.org>
- STEM Journeys Activity: <https://ifthen.widen.net/s/mfl6cpx7sj>
- State of Girls and Women in STEM: <https://ngcproject.org/resources/state-girls-and-women-stem>
- SpectrUM Discovery: www.umt.edu/spectrum/
- Career Girls: www.careergirls.org
- SciGirls Videos: pbskids.org/scigirls/videos
- IF/THEN Collection MGM Portal: www.ifthencollection.org/MGM
- Engineer Girl: www.engineergirl.org
- FabFems: <https://ngcproject.org/about/initiatives/fabfems>



Interested in becoming a STEM Role model? Contact the Montana Girls STEM Collaborative at taylor@montana.edu



STEM Work Session

As in years past, the goals of the summit work session were to bring all participants together to:

- document needs and challenges in the state
- facilitate connections and discussions on STEM priorities in Montana
- brainstorm solutions and explore ways to expand STEM experiences
- create a collaborative framework for more high-quality STEM learning
- connect STEM resources, industry, and mentors to STEM providers
- reflect on how to be more involved in state-level efforts

The work session began with opening remarks provided by Sen. Steve Daines and Sen. Jon Tester followed by the collaboration and networking of summit attendees.

“ The value of an education in the sciences, technology, engineering and math is truly limitless.

-U.S. Senator Daines”

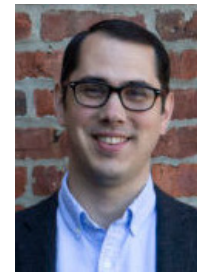
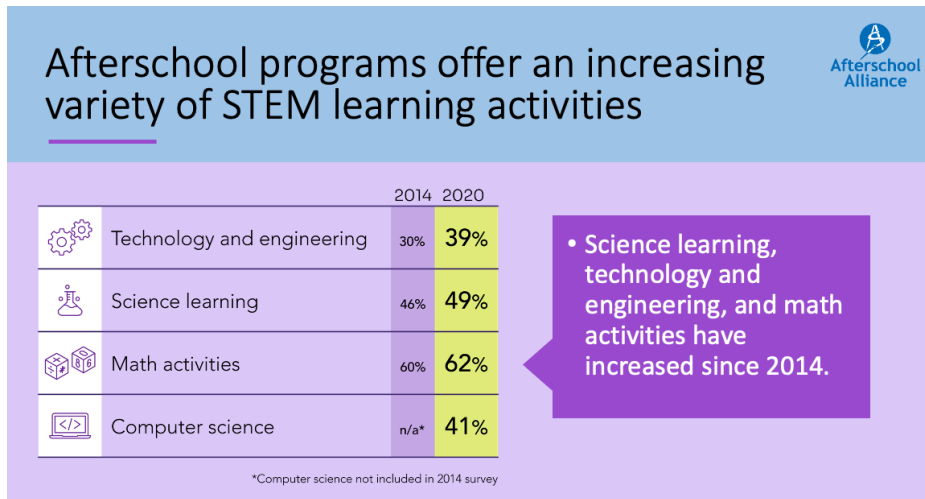
“ It is critical that we are preparing young Montanans to succeed in a competitive job market. And there is no question that a high quality STEM education can set our kids apart.

-U.S. Senator Tester”

Work Session

STEM Across America

Chris Neitzey of the National Afterschool Alliance shared an overview of national STEM followed by Montana-specific data.



Chris Neitzey,
Director of STEM Initiatives
Afterschool Alliance

Big national takeaways

1. Opportunities for STEM learning are on the rise in afterschool programs
2. Parents increasingly see afterschool as important for STEM learning
3. Programs are serving students underrepresented in STEM careers
4. STEM opportunities are not evenly distributed to all families
5. Fewer students benefit from STEM learning due to increased barriers to afterschool participation

Montana-specific data

In Montana, there are 10,538 children with STEM learning opportunities in afterschool programs, and in 2020, 65% of parents reported that their child's afterschool program offered STEM learning opportunities (up from 62% in 2014).

Most parents (62%) believe that STEM and computer science learning opportunities are important when considering an afterschool program, and 76% of parents overall agree that afterschool programs help children gain interest and skills in STEM.

However, several roadblocks exist for Montana children. The top three are:

1. **cost**
2. **transportation**
3. **lack of available programs**






All have increased as barriers from 2014 to 2020.

Source: America After 3PM STEM Special Report, 2020

Work Session

Group Discussion

After reflecting upon issues of national and Montana importance, all attendees were asked to contribute ideas on five discussion topics. The following pages highlight each discussion topic:

|  Barriers |  Overlooked |  Workforce |  Support |  Advance |
|---|---|--|--|--|
| What are the key challenges or barriers to providing or growing STEM in your community? | Who are we overlooking? Who is NOT at the STEM table but should be? | What can we do to help students explore careers and workforce opportunities in Montana? | What is the #1 thing that would support YOU with the STEM work you do? | What is the #1 thing that Montana needs to advance STEM Learning? |



“ I overheard some important thoughts, and I noticed that everyone was engaged in different ways. I think it helped us all relate to one another, which is especially important as we work together to solve the issues we share. ”
-Summit Participant



Work Session: Key Question #1

Challenges and Barriers

Although the STEM Summit aims to focus on the future and not dwell on any negative current situations, organizers have found it helpful to ground the work in the barriers we face to advancing STEM learning in Montana. In both the work session and the exit survey, attendees were asked, “What are the Key Challenges and Barriers to STEM?” Responses are listed below.

Barriers listed in order:

- 1. Money:** funding or lack of resources such as materials or curriculum
- 2. People:** lack of staff or volunteers; capacity; need for mentors and role models
- 3. Transportation:** for students to attend STEM programming but also lack of transportation to take students to off-site field trips or opportunities
- 4. Awareness:** outreach for programs; getting information to parents; misperceptions of STEM
- 5. Collaboration:** need for better communication across the state

Other issues included:

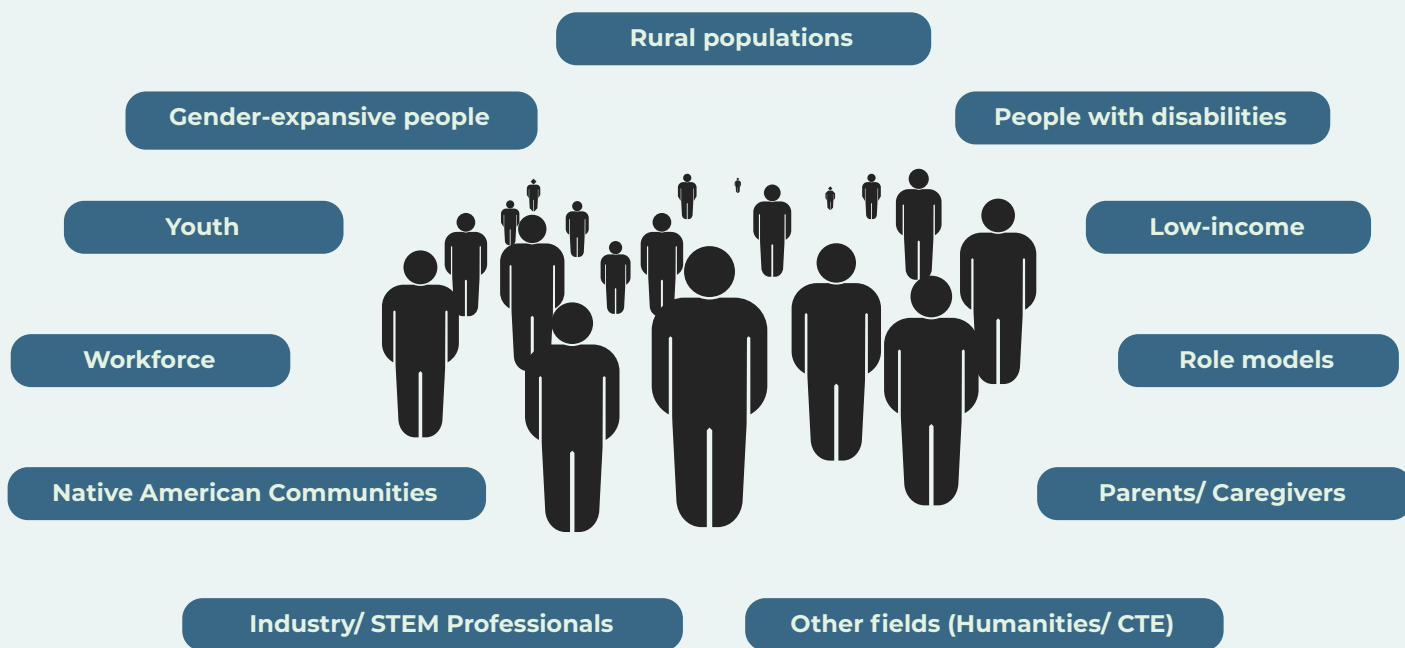
- competition for students' time from sports, etc.
- lack of physical space or need for rent money
- lack of interest, confidence, or resilience in kids
- home life affects participation
- training for staff
- need for resources and curricula



Work Session: Key Question #2

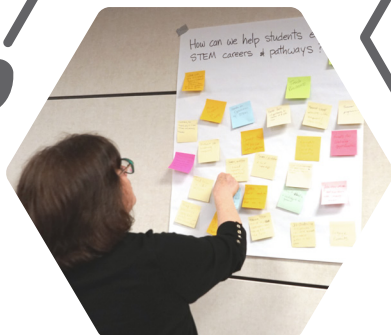
Who are we overlooking when it comes to STEM?

Who needs to be in the conversation:



Source: work session discussion responses from April 13, 2023

“ Adults, especially those without advance education, need these STEM opportunities just as much as kids. ”
-Summit Participant



“ Encourage STEM careers that do not need a four year degree. ”
-Summit Participant

Work Session: Key Question #3

How can we help with STEM careers & pathways?

Build Pathways:

- Work with K-12 schools Career and Technical Education (CTE) with focus on career pathways.
- Create pathways between programs
- Introduce youth to different career pathways through tours, internships and people in the field

Role models

- Have role models incorporated in other programs other than just formal education
- Have STEM professionals do hands-on meaningful activities with students and teachers
- Informational interviews with STEM professionals in middle school
- Link STEM professionals with school counselors who can pair them with students

At home

- More support at home
- Engage parents

Youth Voice

- Get them involved in what kinds of STEM learning and resources is of interest to them
- Follow their interests and help them make community connections
- Encourage their curiosity without labeling it as a career
- Phrase things differently. Not all kids know that their curiosity is worth cultivating

Focus activities and curricula on:

- Real-world, experiential driven activities that connect to problem solving
- Take STEM out of the classroom and into the field
- Curriculum that provides type of careers that use STEM (engineering, chemistry etc.)
- Emphasize how STEM interacts with other areas of interest (fashion, art, film, etc.)

Create industry partnerships:

- Partner with local businesses, hospitals, trades etc. for hands on activities
- work experiences and expectations
- Engage local high-tech companies to provide open house days to showcase what they do and how they do it
- Field trips to STEM employers
- Connect schools with non-profit STEM organizations
- Virtual reality demonstrations
- Mentoring networks
- Connect industry with educational leaders

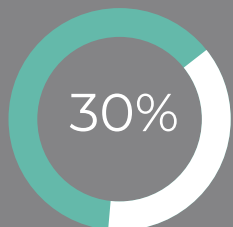
Internships and job shadowing:

- Site/industry tours
- Industry speaking with students
- A more formal relationship with STEM-based companies in MT for work study etc.
- Companies willing to have internships so young people can explore career options

Work Session: Key Question # 4

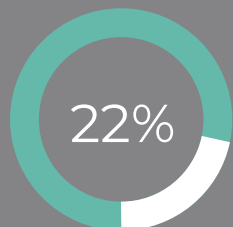
What is the #1 thing that would support YOU?

Montana STEM programs and providers need:



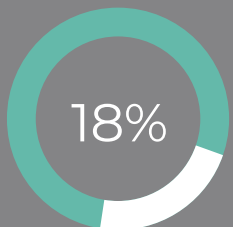
Collaboration

- Funded opportunities to share time and knowledge
- Partnerships between in-school and out-of-school
- Collaboration with colleges and educators



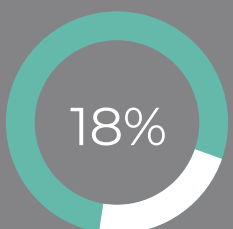
Funding

- Livable wages
- Access to information on what grant funding is available for STEM programming



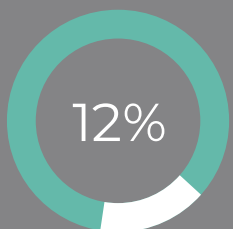
Volunteers, role models, mentors

- Subject matter experts



Visibility

- Support in the community or school district



Staffing

- Living wages
- Professional development and continuing education

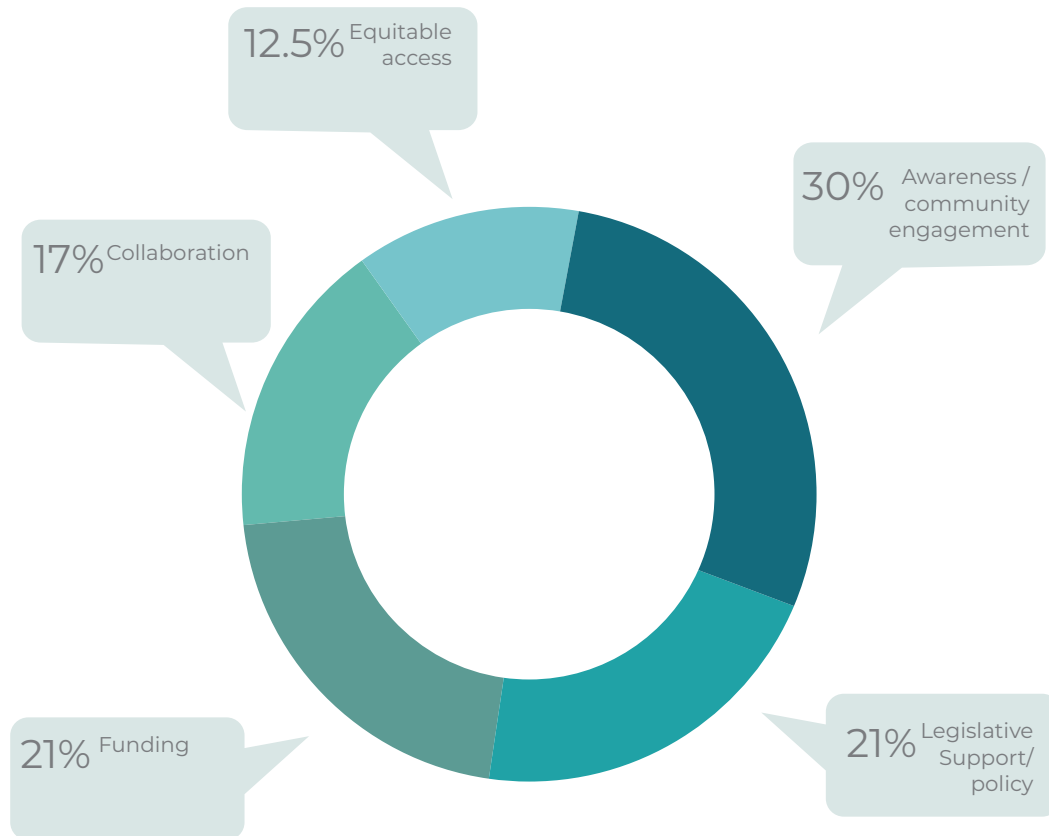
Source: workshop discussion responses from April 13, 2023



Share additional STEM needs by contacting heather@mtafterschoolalliance.org

Work Session: Key Question #5

What needs to happen to advance STEM in Montana?



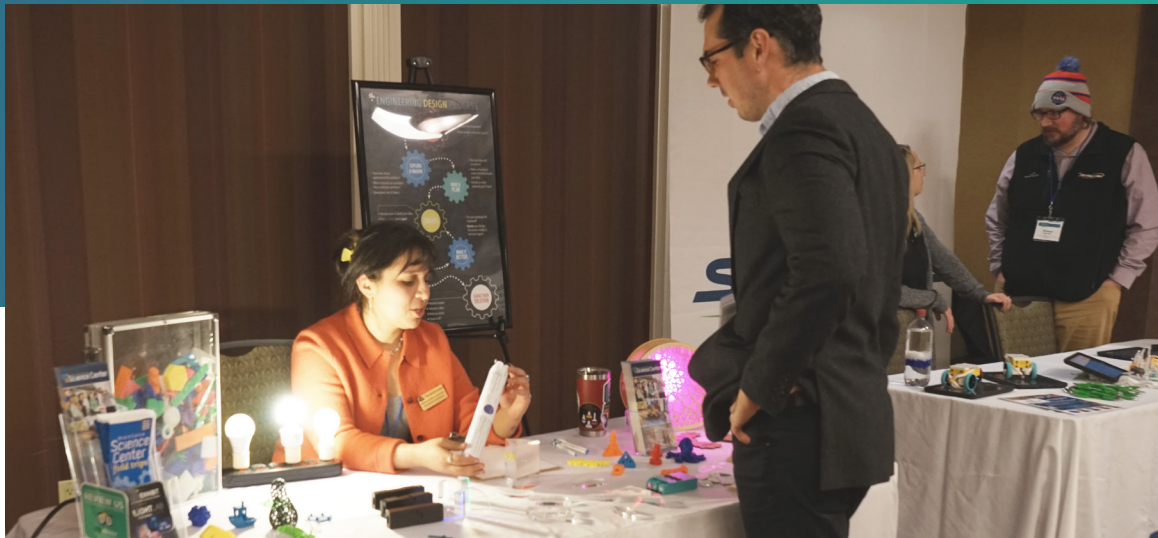
Source: work session discussion responses from April 13, 2023

Other needs included:

- encourage STEM careers that don't need a University degree
- stop anti-science legislation
- concerns for four day school weeks
- more media involvement is needed to get ourselves and opportunities for students out there
- a clearinghouse site that lists resources available in the state that can be accessed and brought in to programs



STEM Open House



This year the Montana STEM Summit returned to an in-person format and included an open house that featured over 20 different programs from across the state. As students, parents, providers, and community members mingled with programs and explored the activities they offered, programs also connected with each other and learned of ways they could collaborate to amplify their offerings.

Kids, families, and community members could be seen playing with a variety of robots, holding pieces of the moon in their hands, or learning to change car coil via a VR headset.

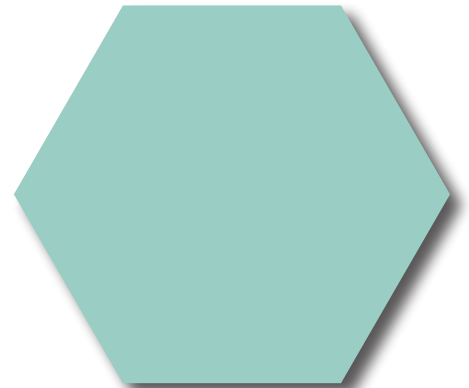


“ I enjoyed being able to connect with people representing different groups across Montana. ”
-Summit Participant

STEM Open House Programs

- Boys & Girls Club of Billings – Virtual reality demonstration
- Boys and Girls Club of Missoula- Teen Club
- Code Girls United
- Confederated Salish & Kootenai Tribes Maker Truck
- ExploraitonWorks!
- Fish, Wildlife, Parks - Montana WILD
- Imagination Destination
- Lewis & Clark Mobile Library
- MAPS Media Institute
- Montana Destination Imagination
- Montana Girls STEM Collaborative
- Montana Learning Center
- Montana Natural History Center
- Montana PBS
- Montana Robotics Alliance
- Montana Science Center
- MSU Science Math Resource Center
- NSF EPSCoR CREWS project
- Snapology
- Sphero, Inc.
- Starbase 2.0
- UM spectrUM Discovery Area
- Waterford.org

To find more STEM programs check out the Montana STEAM Resource Database at:
mtafterschoolalliance.org/steam-resource-database



STEM Student Showcase

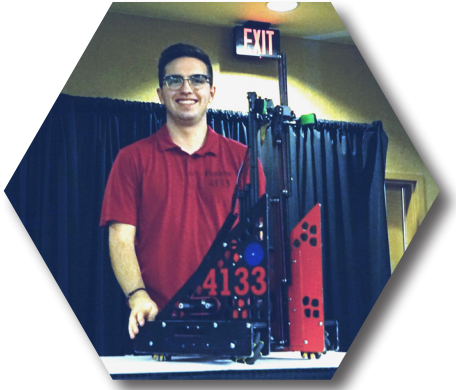


The evening concluded in celebration with a student showcase highlighting the voices of Montana students who shared their stories of STEM learning and how it has impacted their lives. From a high school senior who received a scholarship to continue her passion for STEM in college to an elementary schooler showing a live demonstration of his favorite science experiment, the student showcase made it clear that opportunities to engage with STEM are helping Montana's youth to find their confidence, their voices, and their passions. After a day of discussing the work still needed to grow and expand STEM learning opportunities, the student showcase left STEM Summit participants reinvigorated and reminded about the important reasons of why this work must be done.

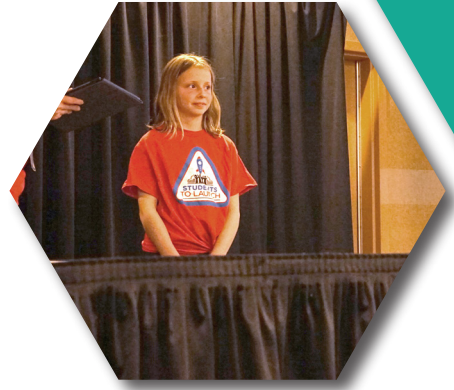


Million Girls Moonshot

“ We are reimagining a future where any young girl can see a place for themselves in STEM. ”
-Aika, Flight Crew '23 Million Girls Moonshot



Team Fusion 4133, FIRST Montana
Montana Robotics Alliance



Students to Launch
NASA in Afterschool

STEM Summit Student Showcase

- Millions Girls Moonshot, Montana's first Flight Crew Member
- Arrow Creek Elementary, 1st & 2nd Grade *(video)*
- Helena School Age Child Care (SACC), Science Experiment
- Boys & Girls Club of Missoula, Teen Club *(video)*
- Montana Destination Imagination, St. Andrew School
- iGraduate STEM Career Academy, Corvallis
- Code Girls United, App Development *(video)*
- MAPS Media Institute, Statewide Media Arts
- Montana Learning Center, Curiosity Through Camp
- Boys & Girls Club of Flathead Reservation and Lake County, NASA in Afterschool
- Boys & Girls Club of Billings, Career Exploration *(video)*
- Montana Robotics Alliance, FIRST Montana
- Student music: Ukulele Covers



Destination Imagination



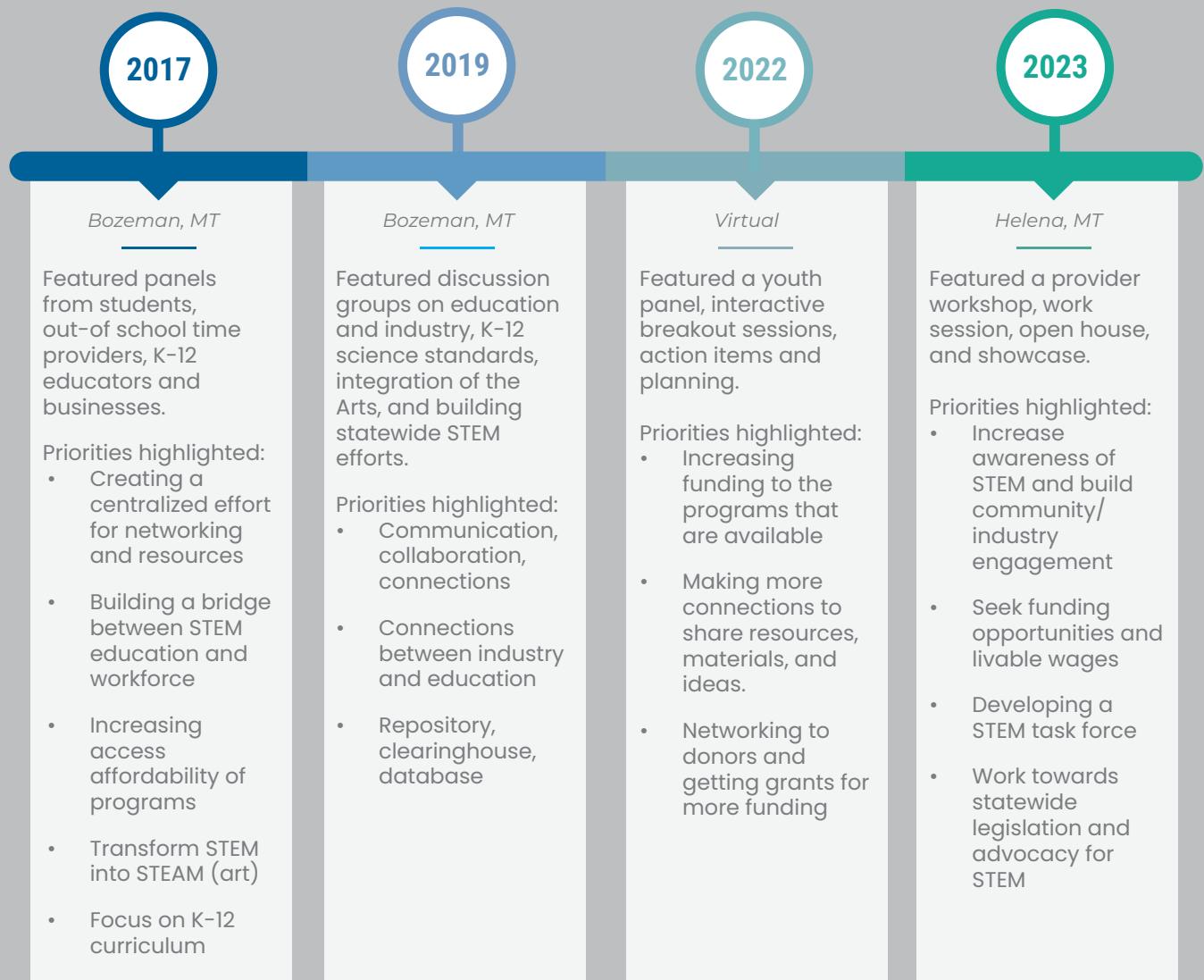
Montana Learning Center

Key Takeaways

Montana STEM Summit

Growing STEM Learning Across the Big Sky


STEM Summits past and present



92% of surveyed STEM Summit participants met someone or an organization they might collaborate with.
-post-workshop survey, 2023

Why STEM?

The Montana Department of Labor & Industry highlights the importance of STEM by stating, "The STEM field is one of the most rapidly growing, highest paying, and most innovative areas of the economy. Jobs in STEM will be vital to Montana's economic growth." -Montana Employment Projections 2021-2031




The number of STEM jobs is projected to grow by **10.8%** between 2022-32.

Source: Employment in STEM occupations, Bureau of Labor Statistics, 2023



The U.S. is at risk of surrendering its global leadership in technological innovation.

Source: STEM Education for the Future - Visioning Report, NSF, 2020

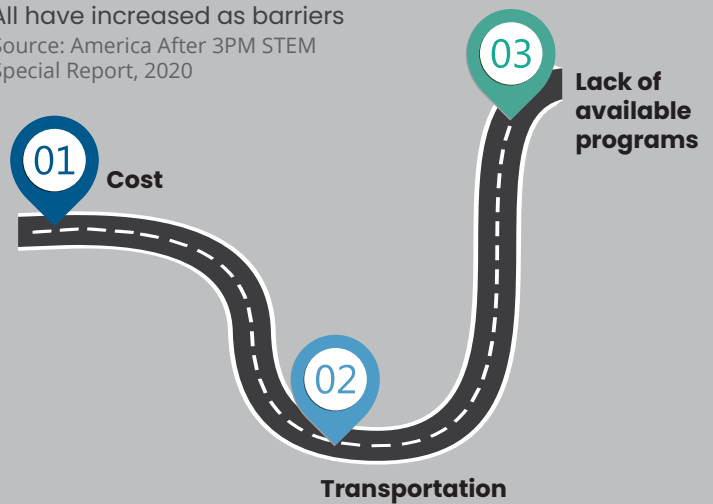


In Montana, **65%** of students are below proficient in Math, and **64%** are below proficiency in Science.

Source: 2021-2022 State Report Card, Montana Office of Public Instruction

Opportunities for STEM learning are on the rise in afterschool programs but roadblocks still exist:

All have increased as barriers
Source: America After 3PM STEM Special Report, 2020



Rep. Mike Yakawich- House District 51
Bethany Wieferrich, Montana Afterschool Alliance
Deanna Mydland, Montana PBS
Rep. Marty Malone-House District 59

References:

Afterschool Alliance. (2020). Montana after 3pm: Special Report STEM.

US Bureau of Labor Statistics. (2023). Employment in STEM occupations: Table 1.11 Employment in STEM occupations 2022 and projected 2032.

Holom, N. (2023). Montana Employment Projections: Job Growth from 2021 to 2031. Montana Department of Labor & Industry.

Honey, M, et al. (2020). STEM Education for the Future - Visioning Report. National Science Foundation.

Montana Office of Public Instruction. (2023). 2021-2022 State Report Card.



Keep connected:

- Sign-up for the Montana STEM Summit email list at: mtafterschoolalliance.org/stem-projects
- Receive a monthly e-newsletter with grant opportunities, free STEM resources and other resources from the Science Math Resource Center MSU. Subscribe at <http://bit.ly/smrc-news>
- Receive quarterly e-newsletters with all things STEM from the Montana Girls STEM Collaborative at <http://bit.ly/girlsstem-news>
- Receive updates on out-of-school time opportunities for professional development, resources, and more at mtafterschoolalliance.org

Make more events like this possible by donating at:

mtafterschoolalliance.org/donate-index-impact



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