Montana STEM Summit
ACCESSING STEM LEARNING ACROSS THE BIG SKY

The Montana STEM Summit was hosted virtually on April 28, 2022 after a hiatus (due to COVID-19) from its biennial schedule. The Summit was founded in 2017 and held again in 2019 with the goal of bringing together representatives from education, business, afterschool, government, industry and nonprofits along with other engaged citizens to discuss how Montana can continue to grow a strong STEM (Science, Technology, Engineering and Math) ecosystem across the state.

The 2022 Summit was hosted by the Montana Afterschool Alliance and Montana State University's Science Math Resource Center with support from MSU College of Education, Health and Human Development; GEAR UP; Million Girls Moonshot; Montana NSF EPSCoR; Mott Foundation; and the Overdeck Family Foundation.

GOALS

Goals of Montana STEM Summits are to bring people together in order to:

- explore ways to expand STEM experiences in and out of the classroom
- create a collaborative framework for more high-quality STEM learning
- share STEM resources across sectors and regions

AGENDA

The 2022 Montana STEM Summit included:

- a keynote talk from Trisheena Kills Pretty Enemy, an MSU graduate student in microbiology from Crow Agency
- a panel of youth from across the state who shared their experiences with STEM learning
- interactive breakout sessions
- action items and planning

ATTENDEES

Sixty-four people registered for the 2022 event, with representation from 42 different organizations including afterschool, K-12 and higher education; community organizations; policy makers; state agencies; and industry. More than 70% were attending a Montana STEM Summit for the first time.
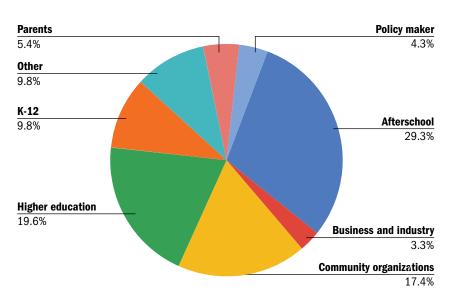
Most attendees came from the afterschool sector (29%) or higher education (20%). Many participants were connected to two or more sectors, with the most common cross-over being afterschool and community organization.

Senators Steve Daines and Jon Tester sent personal welcome messages, and their staff members participated in the Summit.

Participants reported attending the STEM Summit for many different reasons:

Most people were interested in learning about the information offered at the Summit, and many wanted to use the Summit to gain more ideas for their own programs. Others wanted to network with other attendants, establish connections across Montana, and collaborate with others relating to STEM.

Sectors Represented

Pie chart of Sectors Represented:
- Parents 5.4%
- Other 9.8%
- K-12 9.8%
- Higher education 19.6%
- Policy maker 4.3%
- Afterschool 29.3%
- Business and industry 3.3%
- Community organizations 17.4%

Challenges and barriers

Key challenges and barriers as identified by participants

- **Rebounding from COVID-19**
- **Changing demographics in Montana**
- **Misperceptions of STEM**
- **Insufficient funding, staffing and other resources**

2022 participants shared similar challenges to previous Summits in 2017 and 2019, with the exception of COVID-19 impacts, which is new since the last STEM Summit.

Many youth-serving programs are still struggling to rebound from COVID-19. Although most programs are back in person, many educators are burned out from the stress of keeping programs alive (both financially and logistically) while dealing with care for their own families and communities. Professional development and new programming may take a back seat while educators and program leaders work to get back on their feet.

Additionally, demographics are shifting. Montana's overall population grew during COVID-19, with some counties and regions listed among the fastest-growing regions in America. Not only does this mean more demand for programs that serve youth and families in these areas, but the challenge is compounded by rising housing costs and employee shortages.

Funding and access to resources were the most common barriers cited by participants.

Attendees mentioned that ample funding may be available at the federal level, but state and local organizations do not always know how to access it. Additionally, federal funding can be difficult due to compliance. Participants mentioned that grant funding can be difficult for sustainability: when a grant is only two years, it's hard to plan for long-term programming and staff.

Also similar to past STEM Summits participants noted the unique challenges of rural locations with more limited access to STEM (and other) resources overall than the larger communities. Transportation is also consistently mentioned as a barrier. Participants said that some areas of Montana have strong STEM programs (there were specific mentions of Baker and Simms) but we do not have systems in place to capture and/or replicate those ideas and programs.

Multiple attendees cited lack of communication between different organizations as a challenge, stating if there were more conversation and communication between programs, people everywhere would benefit.

- "There are many STEM programs in this area. How do we all show and share our program's highlights; work together to create a mutually enriching statewide STEM effort to form an educational experience that our patrons, families and schools will find interesting and beneficial?"
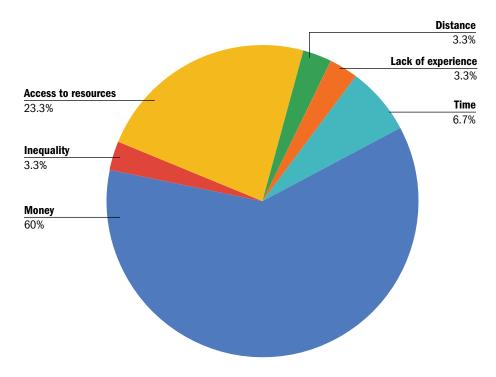 – *Community organization member*

- "I've got three degrees in the humanities… I'm keenly aware that there's very little 'overlap' between STEM disciplines, MSU Colleges, and a lack of conversation between the experts. The 'biggest challenge' to access is finding cross-disciplinary teams that have any interest in outreach!"
  – *Higher education educator*

- "We need to create multi-faceted opportunities—combine afterschool, online courses, etc."

Some of the gaps identified by participants included:

- Better serving Native American students and communities
- Including more parents, teachers, administrators, and retired individuals who want to support in-school and out-of-school-time programming
- More ways to relate STEM to the natural environment, especially with Montana's access to natural resources and the outdoors
- More opportunities to include art in STEM to make STEAM

Participants also mentioned that it can often be a struggle to help others recognize the importance of STEM. Or, educators may recognize its importance but not know how to get started.

Common Barriers People Face when Providing STEM Opportunities

Distance 3.3%
Lack of experience 3.3%
Time 6.7%
Access to resources 23.3%
Inequality 3.3%
Money 60%

Participants reported that students are interested in STEM, but there is often not enough time in the school day.

- "Teachers understand the benefits of STEAM, but don't often have an idea of where to start and where to get activities/curriculum."
- "Anybody can do it that has an interest"

Other barriers mentioned include:

- lack of experience (may need to pay outside staff),
- lack of time, and
- inequalities

Who else should be at the table?

Participants were asked who else should be part of the STEM conversation?

- More classroom teachers
- More elementary teachers (who may not have a STEM background)
- Libraries
- 4-H
- Extension
- GEAR UP
- Rural organizations
- School administrators (principals, superintendents, counselors)
- Employers
- More geographic diversity (most participants were from Western Montana)
- Industry, especially those who can offer local jobs
- STEM community, especially local
- Parents
- College-level clubs/societies
- Business and technology

Dreaming big

Participants were asked to dream big: "What would you wish for?" Answers included:

- Hire more staff
- Raise staff wages
- Paid Professional Development (PD) for staff
- Purchase materials for program
- Money for advertising
- Recruit more kids into the program
- Work with people in the community to provide more programming
- More time for PD for educators to come together, plan, learn what and how to provide support to students
- Extra funds to create workshops for parents/educators to learn firsthand the value of STEAM education. Creating an environment that promotes this to adults would be the best
- Add additional STEM courses for younger students (middle school), eliminate cost sharing with schools so more programs could be adopted across the state.
- More specialty courses for K-12 students
- More programs for Indigenous students
- Statewide list of resources for funding and mentors

In order to advance STEM in Montana, several ideas were presented:

- Increasing funding to the programs that are available
- Making more connections to share resources, materials, and ideas.
- Networking to donors and getting grants for more funding
- "Quality learning materials and supplies, quality curriculum, access to all students, on board with National clubs and standards for students, STEAM labs in all schools, scheduled STEAM block in learning day, and grant money spent on quality STEAM programs."
  –Member of the business/industry sector

Attendees were asked what steps they could take in order to advance STEM in Montana. The main answer was continuing to do the hard work required by prioritizing the children who benefit from STEM programming. Another highlight is continuing to reach out to connections in the community that could support STEM programming.

- "Continue to reach out and try to make connections between the STEM communities that I work with and reach out to new ones when they cross my path."
  –State agency representative

"As a parent, I want to increase kids' exposure to STEM careers: they only see doctor and lawyer…"

One afterschool educator wished for "Being able to pay the people I have had come in the past to teach 3D printing and coding and robotics. I would also love to get some updated Lego robotics kits to use with our kids and get some iPads to use with those kits. I would also love to put together a science experiments kit/tub with supplies and a binder with experiments and STEM activities that can be easily done with kids."

Planning the next statewide STEM Summit

While the first two Summits in 2017 and 2019 were in person, the 2022 event was virtual. Of participants who completed the 2022 exit survey, 54% said they would prefer a hybrid format for the next STEM summit, 15% would prefer a completely virtual format and 8% of people would prefer a completely in-person summit (The rest indicated no preference).

Of those who completed the exit survey, 39% said they would like to see more lesson planning and classroom activities revolving around STEM included in the next summit. Participants also expressed interest in

- More information regarding research and data (22.2%)
- Having more networking opportunities (16.7%)
- More presenters (5.6%)

Some specific ideas included:

- "anything that involves afterschool coordinators and connecting them to some outside vendors in order to bring in STEAM programming for afterschool programs." And "Higher education instructors are interested in connecting with more STEM instructors to build their network."

- "A professional progressive dinner idea, but STEM is what's on the menu! This would create opportunities to share one another's area of expertise and collaborate to take forward as a team. The main course would be the current research, hot topics, students sharing in STEM, etc. Each participating STEM partner would have the chance to share as this could be run two times a year. The main idea I am sharing is that it is extremely helpful to work for positive partnerships!"
  –A community organization member

ACTION ITEMS

Action items and next steps reflected the challenges and gaps outlined above:

- Resources for funding and mentors
- Intentional outreach to Indigenous students / reservation schools
- Broader coordination efforts across the state
- Create an asset map
- Exposure to STEM/STEAM for younger kids
- Add the A and get STEAM to use the arts as a pathway to gain student interest in the other fields
- Connect everyday things to STEM
- Access STEM resources: NIH lab, outdoors, mining industry, Fish & wildlife, DNRC and watershed groups, local beekeepers
- Collaboration between school-day and out-of-school-time STEM
- Connect more with two-year schools
- Outline a better role for parents
- Help new afterschool mentors know what resources are available

For more information:

Montana Afterschool Alliance: www.mtafterschoolalliance.org

MSU Science Math Resource Center: smrc@montana.edu • www.montana.edu/smrc