

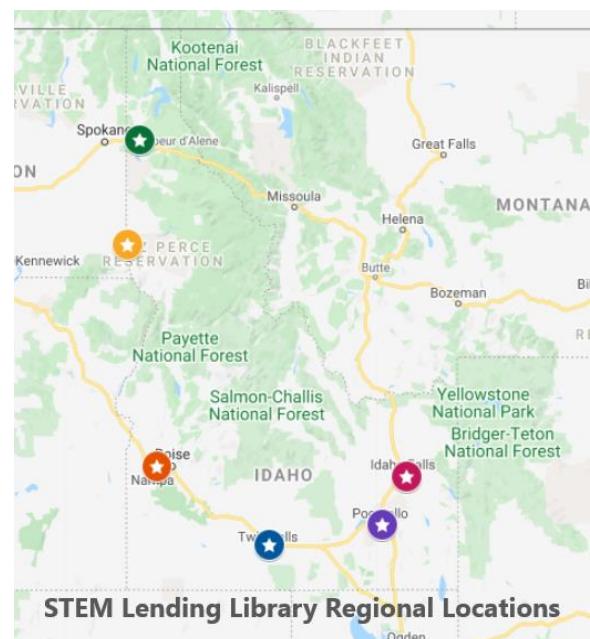
# Idaho Regional STEM Lending Library Network

## Abstract

The COVID-19 pandemic shed light on the importance of the Idaho STEM lending library network, an existing infrastructure, while also highlighting the need for improvements to best support educators both during and after the pandemic. There are multiple advantages to housing STEM resources in regional libraries. Rather than providing resources to individual educators to safely implement hands-on projects with their students, a costly endeavor, the STEM libraries allow resources to be housed in centralized locations and shared across communities and school districts. To meet shifting educational needs in 2020 and beyond, the Idaho STEM lending library network embarked on an ambitious plan to update the libraries' existing infrastructure and improve their overall usability for educators and library managers alike. Proposed improvements included: 1) increasing library resources to allow for 1:1 technology access in socially-distanced and/or virtual learning environments; 2) curating instructional videos and curricula to make library items more relevant and easy to use; and 3) expanding library access through the creation of an online catalogue and promotional campaign. In the process of putting these solutions into practice, a number of key insights were revealed about the needs of both educators and managing institutions. Improvements envisioned and implemented as an emergency response to the pandemic will in fact have a lasting positive impact for educators and students for years to come.

## Background

The Idaho STEM Action Center (STEM AC), is an agency under the Executive Office of the Governor, charged with engineering innovative opportunities for educators, students, communities, and industry to build a competitive Idaho workforce and economy through STEM and computer science education. STEM AC collaborates with higher education institutions in the state to manage six STEM libraries that contain materials, resources, and devices for educators to check out and use in their learning spaces. To ensure access to educators from all areas of the state, these libraries are strategically housed in six geographically dispersed locations: North Idaho College (Coeur d'Alene), Lewis-Clark State College (Lewiston), College of Eastern Idaho (Idaho Falls), Idaho State University (Pocatello), College of Southern Idaho (Twin Falls) and College of Western Idaho (Nampa). Library managers also deliver or ship resources to educators living in rural or frontier communities within their regions.



The libraries were established over a period of 10 years, initiated by a federal grant to the state. In the last three years, the libraries have come under the umbrella of STEM AC and state funding. Library managers are employees (instructors, professors, deans, and education specialists) of the hosting institutions, and their time is contracted by STEM AC. STEM teaching materials in libraries have accrued over the years mostly through donations from industry partners, such as Micron Technology and Idaho National Laboratory; and from teaching kits developed for professional development workshops (“The i-STEM Institutes”) delivered at the six locations each summer. In addition, donation and grant funding is used by library managers to make targeted purchases to enhance their libraries or to replace consumable items for kits.

While the libraries have served educators across the state for a decade, the arrival of the COVID-19 pandemic prompted a realization of the network’s potential to support socially-distanced learning, while resisting the regression to low-engagement, pencil-and-paper approaches. As the pandemic continued, however; it became clear that accessing external resources or incorporating new technology was a challenge for many educators, who were primarily focused on developing competency with the technology and expectations of the “new normal” for learning during COVID-19. This underscored an even greater need to make library items accessible, relevant, and easily integrated in the classroom setting.

## **Problem Statement**

Hands-on approaches to STEM education are effective in teaching valuable technical skills as well as lasting soft skills (e.g. problem solving, critical thinking, and team building). These skills are important for students to access social and economic opportunities for themselves, and to support a growing and diversifying economy for the state of Idaho. This year, during the COVID-19 pandemic, maintaining hands-on STEM learning opportunities posed an enormous challenge for educators, who were not equipped to adapt existing lessons and programs to the health and safety measures necessitated by the pandemic; and lacked sufficient material resources to do so.

STEM AC recognized that the library network could be mobilized to help close this gap; however, several improvements were needed to serve educators better both during and after the pandemic. Firstly, the libraries lacked classroom sets of STEM materials, making it difficult to engage large groups of students generally, and impossible to use in a socially-distanced context. Secondly, when compared to their potential user base, the libraries were underutilized *prior* to the pandemic, which the network preliminarily identified as resulting from several factors, including low educator awareness and insufficient resources on *how* to use the items in a teaching context. Thirdly, the library network lacked a formalized system for tracking item circulation or numbers, making it difficult for hosting institutions to collect usage data and for educators to access basic information about what was available at the location nearest them.

STEM AC developed its proposed solutions based on these apparent challenges; however an initial meeting with the library managers in October of 2020 shed light on how these problems affected each site in different ways. Each library evolved over time under the unique

opportunities, constraints, and bureaucratic infrastructure of its hosting institution. Each library also serves a unique population of educators, in terms of educator roles, student demographics, geographic distribution and technological expertise. Thus, the additional challenge was introduced of how to implement solutions in a way that honored each library's specific needs.

## **Solution**

At the outset of the grant period, STEM AC identified three solutions to improve library usability both during and after the pandemic. An initial meeting between library stakeholders in October 2020 sought to establish strategies and best practices for implementing these solutions across the six library sites. Additional planning meetings were held in January and February of 2021 to discuss general progress and updates. Individual 60-90 minute listening sessions were also held between STEM AC and each library manager to document current library management practices, assess inventory needs, and identify site-specific pathways to progress on the network-defined solutions.

The three solutions and their progress thus far are outlined below:

### **1) Increasing the number of resources to allow for 1:1 access**

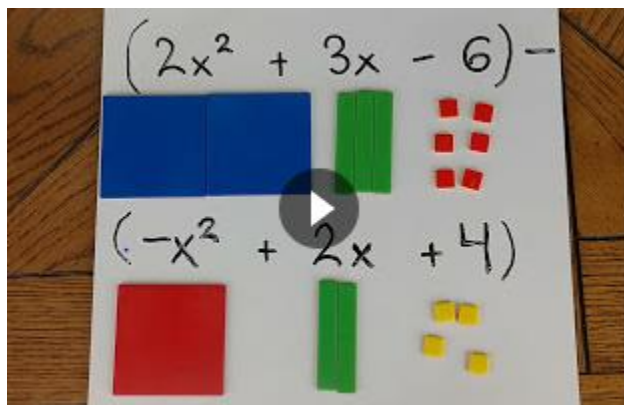
STEM AC secured Governor's Emergency Education Relief (GEER) funding through the CARES Act for the libraries to expand their collections, with a focus on increasing the number of classroom sets available for check-out. Offering 15-30 of the same item allows for materials to be sent home with students and/or to be used by one student at a time in a socially-distanced learning context. In addition, smaller device-to-student ratios make it easier for educators to engage students and ensure everyone gets hands-on time.

*Progress* — Individual library locations were given the flexibility to identify items they thought would serve their user base best, with an emphasis on providing greater quantities of individual items for classroom use. For example, one library purchased sets of (30) three-dimensional plant and animal cell models. Another worked with STEM AC to identify a classroom set of Sphero educational robots with detachable charging cradles that could be sent home with individual students. A third manager, concerned with outdated teaching tools and curriculum within her library, conducted outreach with teachers in the local school district to determine educational materials in highest demand. In cases where managers were unsure about the right items to purchase, STEM AC offered guidance based on their current inventory and facilitated information sharing between sites about items currently popular with educators. As part of the detailed inventory process going on at each of the sites, STEM AC made sure each item available for check-out was identified as a single or classroom set (with quantities specified) so that educators would know the items they were looking at could be implemented successfully in the classroom context.

### **2) Creating & curating high-quality instructional videos and curricula**



One of the primary factors for underutilization of library resources identified by the library network was the lack of lesson plans, activity guides, and other instructional resources associated with the items. Educators need immediately accessible resources on how to incorporate library items into their curriculum and/or program goals in order to be able to use them; thus STEM AC sought to develop these resources and make them available alongside the physical library items.



*Progress* — An early insight in the resource curation process was the need for individual library locations to take inventory of their collections, including manufacturers, models and whether or not there were existing instructional resources (e.g. assembly instructions, getting started guides, etc.). STEMx-funded work stipends were used to support library managers in conducting or securing aid for this process. From there, STEM AC worked with a Maker Fellow VISTA

Volunteer through the Makers + Mentor Network to curate lesson plans and other resources for library items. In addition, STEM AC contracted a STEM education specialist to identify gaps in existing resources and create instructional videos for items common to several library locations (such as a video on the instructional uses of algebra tiles; see image at left).

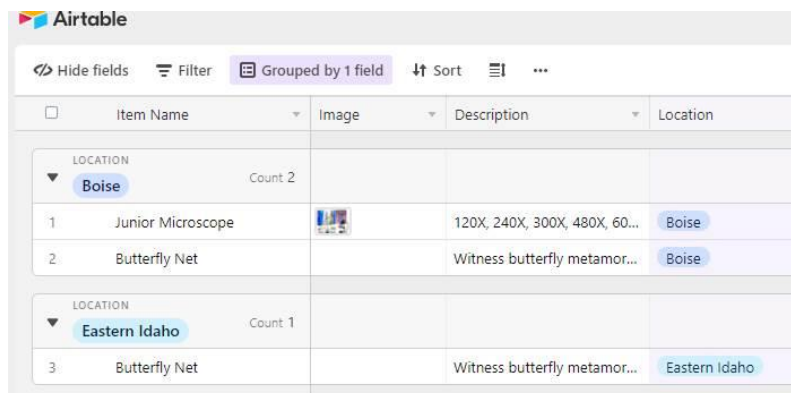
Over the course of several feedback sessions, a solution was developed to create “Start Here” documentation for certain library items, that would include critical information about processes such as accounts that needed to be created, software to be downloaded, accessories or consumable materials to have on hand, troubleshooting tips, and direct links to lesson plans, labeled and organized by topic and grade level. Such documentation would be available for download through the item’s entry in the online catalogue. In addition, individual library managers could choose to share this information with educators via email upon check-out, or via a USB that is checked out with the item(s).

### **3) Expanding library access through the creation of an online catalogue and promotional campaign**


To increase accessibility and circulation of library items, STEM AC sought to develop a centralized online database that educators across the state could use to quickly identify available materials in their area and library managers could use to efficiently manage inventory and the check-in/check-out process.

*Progress* — Feedback sessions with library stakeholders revealed several key needs for an online catalogue, including: simple to navigate for educators and managers alike with no need for educators to create or maintain an account of any kind; ability to quickly and easily update

item records; flexibility for library managers to customize the item request and check-out process according to their needs; and capacity to host the companion instructional materials (video and curricula) in development. STEM AC worked with a Boise-based software company, Clearwater Analytics, to identify a database and create a proof of concept. Airtable was selected for its relative affordability, satisfaction of the above criteria, and demonstrated success at the library location where it was already being used. Airtable also offers the option to link records between different databases; thus STEM AC is able to create a second database of instructional resources available via download or link, each of which can be linked directly to library items with which they are associated, as well as accessed independently by educators who already have the necessary technology and are simply searching for a lesson plan.



The screenshot shows the Airtable interface with a table of items. The table is grouped by the 'LOCATION' field, showing two groups: 'Boise' (Count 2) and 'Eastern Idaho' (Count 1). The columns are 'Item Name', 'Image', 'Description', and 'Location'.

	Item Name	Image	Description	Location
<b>LOCATION: Boise (Count 2)</b>				
1	Junior Microscope		120X, 240X, 300X, 480X, 60...	Boise
2	Butterfly Net		Witness butterfly metamor...	Boise
<b>LOCATION: Eastern Idaho (Count 1)</b>				
3	Butterfly Net		Witness butterfly metamor...	Eastern Idaho

A state-wide promotional campaign for the library network is in development with input from the library network, the focal point of which will be the i-STEM

Professional Development Institutes

that will be held at each of the library locations in June. As these institutes will be hosted virtually, solutions are being explored to effectively reach the 400+ educators who will attend through a digital medium, such as a promotional video that is played at the beginning of each general session and a “virtual tour” of the online catalogue. STEM AC will also create a screencast tutorial for how to navigate the catalogue, initiate an item request (customized to each site as needed), and access the associated instructional resources. To target the intended audience effectively in each community, input from local stakeholders will be used to customize the promotional strategy, both at the i-STEM institutes and beyond.

## Conclusion

The STEM lending library network is an innovative example of education infrastructure that helps educators across the state of Idaho to engage students in meaningful hands-on learning, investing in their futures and the future of the Idaho economy. The COVID-19 pandemic invited a rare opportunity to investigate where the library network was falling short of its potential and to implement improvements. Other states/regions interested in developing a similar network may benefit from incorporating from the outset an online management system, companion instructional resources and a practice of curating classroom sets of items where possible; and should consider the input of strategically-located stakeholders within the service area(s) to shape resource acquisition, content management and long-term growth.