

## Idaho STEM Action Center Sample Application



*Note: This sample application includes edited versions of responses to common questions taken from several different submissions and is intended to give grant applicants a better idea as to the expectations of the STEM Action Center. Each response should be viewed regarding the specific question it seeks to address and not as a part of the larger application as a whole.*

**Question: Describe the overall program for which you are requesting support. Be as specific and detailed as possible.**

Our Elementary School has been hosting a community STEAM event for seven years. This event will take place from 8:30-4:00 on Thursday, May 24th, 2018. Each year we have a theme that involves the community. This year our theme is, "You'll Never Walk Alone." During the event, we seek to provide one type of STEAM equipment which students can experience. We feel that purchasing quality innovative STEAM materials/equipment inspires our community to the possibilities of using the materials in the future. This year we decided to request funding for the purchase of a beginner drone with GPS capabilities, object avoidance, can be controlled by hand gestures, and transmits photo/video. We selected these features after talking with a few experienced drone pilots. Following the pilots' suggestions, will help our students, even those with special needs, be able to fly the drone with success. We selected a drone this year because a hiker in our area recently fell off a cliff while hiking with friends. The search and rescue team used drones to search for his body, showing one of the many ways drones can be helpful to emergency responders.

During our STEAM day event around 250 students will participate in workshops presented by teachers, interested parents, and other community members. Throughout the day, students get to select five, hour-long workshops from around 20 different activities. At the end of the event, participants fill out surveys, go to a closing assembly, and then take their parents or other community members through the project gallery of student work from the day. Workshops this year will be designed around our theme, "You'll Never Walk Alone." An important character trait related to our theme includes having compassion by helping other people. The workshop

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schedule has not been developed yet, but one idea we have, along with the drone search and rescue, includes 3D printing prosthetics.

### **Question: What are your learning objectives or goals associated with this program?**

Our program seeks to meet the following goals:

(1) Increase opportunities for students least likely to have access to STEM engagement outside of school, subgroups within our school population include special education students, English Language Learners, girls, and those with low socioeconomic status (receiving free or reduced lunch).

(2) Combat against the "summer learning slide" through continued summer engagement with math, reading, team collaboration, exposure through field trips, etc.

(3) Increase the proximity of our students to those in the local community & STEM fields that also represent historically under-represented identities (women, people of color, those that identify as having a learning or physical disability)

(4) Students will create, prototype, and build a physical bridge in teams, to be showcased with an audience at the end of camp. In doing so, they will be guided with social-emotional and collaboration strategies, in domains not limited to: art, engineering, coding, math, and literature.

(5) Students will explore and create an end of camp project that connects their learning through physical bridges to figurative bridge building in the community. They will share their findings and proposals with the end of camp audience.

(6) Students will have increased engagement and positive mindsets regarding themselves as a learner and in a STEM field.

### **Question: How will you know that you meet these goals? Be specific about implementation of surveys, portfolios, and other tools used to measure learning.**

We will survey our youth patrons at the beginning of the summer program using a Likert scale, asking about their comfort level and interest in science, particularly as a job or career opportunity. At the end of the summer, we will survey them again asking if the summer program helped them be more comfortable and more interested in science and science careers. Our goal would be to see at least a 70% gain.

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At the beginning of the summer, our survey will also include a listing of the Idaho State science standards we will cover, and we will have our participants judge their understanding of those standards using a Likert scale. At the end of the summer, we will repeat the survey and have them judge their understanding of those same standards on a Likert scale. Our goal would be to see a 20% gain in understanding.

Students will also build a portfolio of their work over the course of the program and share those as part of the culminating event, featuring their personal highlights from their experience. We will also post photos of youth engagement on our website and social media pages. We will include comments made by the youth as to the impact they feel the program had. Besides engagement, we will also collect data on attendance to report to our board.

**Question: Please describe your timeline for this project, including planning, implementation, integration of measurement tools, and analysis and reporting.**

Planning for the project has already begun. There are two people on the committee and all teachers are on-board with the day's activities. The school leadership team has already discussed the event and approved the May 21st date. The measurement tools have already been created for the parents and are in the process of being made for the students. We will look for other small grant opportunities to help with the cost of workshop supplies. We will start recruiting community members to lead workshops in late January and February. An announcement will be sent to the staff requesting their workshop titles and descriptions. In March, plans will be made for the location of each workshop with backup plans for the outdoor groups in case of inclement weather. In late April, a letter will be sent home to parents explaining the event and how students can register for their workshop. Student registration will take place in the first week of May. Workshop leaders will get their list of attendees in the second week of May. On the day of the event, the students will be served a picnic lunch from the school cafeteria. In the last half hour of the day, students will take a survey in their homeroom class and meet on the playground for a final assembly involving the drone, which will take an aerial photo of the whole group. At this time students will get a chance to share some of their favorite parts of the day. The gallery event will take place immediately after dismissal. The data and reports will be ready to submit in mid-June.

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**Question: How is this program aligned to the STEM AC Mission of "Engineering innovative STEM opportunities for educators, students, communities, and industry to build a competitive Idaho workforce and economy?"**

We believe that we can go farther together and that through intentional and strategic community partnerships, our program will both benefit from and add value to the mission of the STEM AC.

Priorities of our program include building the learning and capacity of our team members/educators through collaboration with industry professionals and community partners. We seek to learn and grow through the program, not only to provide a transformational summer program, but to also take our learning back to the larger school community and regular instructional program. We hope to be a proof-point school in Idaho in terms of what is possible for ALL kids across a range of demographics and identity markers.

One of our school-wide priorities is scaling our project-based model and integrating the Teaching Tolerance domains (identity, action, justice, diversity) more fully across our curriculum. We believe these priorities will build stronger students and long-term, more equipped, and transformational leaders for our communities and industry.

We believe that by creating meaningful experiences and proximity to those within the local STEM industry, that our students are more likely to "see" themselves in those fields and professions. Providing the opportunity to solve real world problems alongside a diverse group of adult mentors from a variety of STEM professions can be a transformative event for many of our students. We seek to create opportunities that are both "windows" and "mirrors" for our students so that they have the confidence to pursue whatever careers they may choose.

**Question: How does this project showcase or promote integrated STEM learning and practice?**

Our Summer STEAM Program provides an emphasis on physics and integrates real-world problems related to ocean ecosystems and provides project-based learning in physics concepts students often struggle with. We also integrate art design, both through painting techniques and beading designs and motifs, and incorporate art history. We will also utilize the science and engineering practices of asking questions, developing a model, modifying the design, planning, and carrying out investigations, analyzing data, and communicating information both within the team and to a larger audience, where students will explain their process and defend their conclusions.

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### **Question: How will this program further your professional goals related to STEM education?**

One of my professional goals related to STEAM education includes increasing STEAM literacy for all students, including those who do not intend, at least initially, to pursue STEAM-related careers. This program provides a way for all students to find an area of interest to explore at an early age. It also allows students to get a diverse range of STEAM experiences so they can gain a better understanding of the relevance of STEAM to their lives. It also gives them a broader understanding of STEAM-related issues. Helping my students to gain this perspective is an ongoing professional goal of mine and is at the core of what I do.

### **Question: What specific steps do you plan to take to recruit and retain underrepresented populations in STEM through your program (including female participants, racial/ethnic minorities, rural communities, families with low SES)?**

As a school with nearly 60% of students qualifying for free or reduced lunch, 20% English Language Learners, over 15% receiving Special Education services, and approximately 50% identifying as students of color - we have a socioeconomically diverse student population. We also have a racially and gender diverse student population. In this case, 100% of students at the school will directly or indirectly learn through the project, thus engaging a wide array of historically underrepresented populations.

We believe this camp has the power to build bridges within our own school community, too. Our learning will also spill over to the neighboring Boys & Girls Club with whom we have a close partnership and many of our students attend, engaging even more underrepresented populations indirectly there.

For camp enrollment, we plan to reserve 70% of seats for students that fall under one or more of the subcategories listed above. We believe this is necessary to recruit and ensure that our most underrepresented populations can participate.

In terms of community involvement, guest speakers, and project collaborators for the camp, we have a commitment to ensuring at least 70% of guests are also representative (women, women of color, identifying as coming from a low-income background, men of color, those identifying with a disability, coming from a rural background). For example, we are hosting guest architect, MaryAnne Wilson from Acme Architects (woman of color).

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As noted earlier in our application, students will also engage in a daily circle in which a STEM pioneer and/or figure is highlighted, and we take a "deep dive" into exploring more about them. After the first week of camp, we will also open up the opportunity for campers to explore/research and bring their own STEM pioneer/figure to the daily circle.

### **Question: How does your program incorporate or promote mentorship and/or STEM role models?**

We invite the Women in Science Club and the Black Engineers Club from the University to each present a workshop at the event. These groups provide role models for our female and minority students more than just during this event. Also, we have already connected with the Big Brothers Big Sisters program and have started a partnership that will connect females in STEM-related fields with girls at our school. We will take the opportunity to leverage these partnerships during the summer camp as well. A goal for all of our students is to start building their own (supervised) networks of professionals and community partners with whom they can collaborate.

### **Question: How does your program incorporate or promote experiential learning and/or family involvement?**

We ask that each family makes a commitment to attend the end of camp showcase, as well as review their child's digital portfolio daily. We understand each family has a different capacity to attend and be involved and hope that the digital component allows more families to be engaged. Staff of the camp will also share weekly and daily memos - ways that parents, families, and siblings can take part in the learning, too.

The program also aligns and promotes our school wide project-based learning modules, which take place during the school year. These hands-on, experiential learning activities promote creative problem solving to authentic problems experienced in our community. Families will be familiar with the model and we hope this creates ease and comfortability with interacting with our team and the summer program. Finally, some of our parent-experts will be involved in mentoring our students during the camp.

### **Question: Please describe how you are partnering with other organizations or groups to make your program successful (funding, volunteers, showcases, etc).**

We have developed and maintained a close relationship with the Boys & Girls Club in our community. With the sharing of space and resources, our school and the Club mutually benefit from the learning and social development that takes place during and after school, as well as over

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the summer. Our relationship with the Club will be a great benefit in recruiting and maintaining strong attendance throughout the summer as many children are already part of the summer Club program and have transportation to and from the facility.

We also hope to leverage our growing relationship with students and staff at the neighboring high school. Students there have supported multiple projects including our current and highly popular after school skateboard club (they are designing and crafting skateboards together using many components of technology and the engineering design process), as well as providing older peer role-models to our younger students.

In terms of volunteers and engaging outside organizations, our main avenue of partnership will be through our weekly field trips and guest speakers. We would also like to utilize volunteers to host our end of camp showcase somewhere in the community, perhaps at the local library (TBD).

### **Question: How does your program incorporate or promote real-world applications and experiences of STEM topics?**

Our 5th-8th grade students will be grappling with real-world issues such as causes of extinction, rising sea levels, and impacts of heat and thermal dynamics. They will work collaboratively in developing a plan to bring the California sea otter back from the brink of extinction and they will be tracking great white sharks across the open ocean. They will also have experiences in cultural diversity through a variety of hands-on art projects that will allow them to examine the STEM processes that make art possible in different parts of the world. They will also problem-solve hands-on physics challenges while studying the ideas of motion, such as velocity, speed and the major role gravity plays in the movement of objects. All these activities are based on authentic problems/challenges humans currently face and all will be addressed with a variety of STEM skills and processes.