Program Elements

According to Anne Jolly, writing a blog on MiddleWeb in 2014, "In today's economy, when innovation in STEM is most critical to our nation, those least prepared in STEM coursework – minorities and our economically disadvantaged students – are often less prepared for the workforce. Students without STEM learning options are likely to wind up with lower social and economic mobility, be less informed about science and technology, and experience a diminished quality of life." And, yet, continued Ms. Jolly, "We have evidence that high-quality, project-based curricula such as STEM might narrow the achievement gap for children from low-income backgrounds and other groups who are traditionally underrepresented in STEM fields."

The educators at Two Bit Circus Foundation know that students from all economic and ethnic backgrounds can learn at rates equal to more economically advantaged students from its own experience of furnishing 88 Makerspace STEAM Labs to preK-12 schools within LAUSD, nearly 90% of them to Title I schools. Said one Title I principal in his thank you letter, your "...STEAM Lab created a WAVE of creative problem solving in every one of our grade-level teams teaching science, math, and social studies in our STEAM Lab. Your donation has had a major impact on our teachers and students, and is part of the reason that we have been able to spearhead so many inspirational programs in our school."

2BCF's core programs, Makerspace STEAM Lab and STEAM Carnival speak directly to the District's over-arching goals of "**Graduation, College and Career Readiness**, **Student Engagement** and **Academic Supports**" as well as the PFSS goals of "**college and career readiness, academic enrichment** and **intervention, student and parent engagement.**"

2BCF's Makerspace STEAM Lab (MSL) is a designated space within a school where 2BCF materials and tools are stored, and where STEAM classes create interdisciplinary hands-on projects as called for in contemporary educational standards. Makerspace STEAM Labs focus on the integration of the STEAM disciplines through the application of Maker principles and the engineering design process. They also address career-readiness – whether in the industrial vocations, math, or technology. MSL program goals are to: 1) inspire a generation of students to use critical and creative thinking skills for problem solving; 2) inspire the next generation of scientists, engineers, researchers and entrepreneurs; 3) introduce students and teachers to project based learning concepts using non-prescriptive materials; 4) engage teachers with the new educational standards as a way of moving students through the school-to-career pipeline while inspiring environmental stewardship; 5) establish research as a goal among students by altering their attitude toward science, technology, engineering and math; 6) assist teachers in creating an inspiring, well-organized space for student exploration and the creation of projects, both school-related and for social or entrepreneurial ventures; and, 7) provide schools a valuable on-campus resource which supports their efforts to achieve STEAM performance goals.

Each Makerspace STEAM Lab comes complete with design elements, upcycled materials and grade-specific curriculum. Educators are introduced to the MSL, and provided sample curricula, tool safety education and examples of hands-on projects that can be constructed from the materials. Emphasis is placed on the integration of the disciplines, and how the 2BCF materials can be used in art, math or science projects - how they are all members of the creative family. Teaching personnel are encouraged to attend ongoing professional development seminars held quarterly at the 2BCF office/warehouse in Gardena.

Students who have access to MSL learning will become fluent in the engineering design process: *Brainstorm, Design, Build, Test, Improve* as a way of approaching all projects, not just engineering. They will be challenged to design and build some sort of prototype to solve a problem, using the four C's in the engineering design process: Creativity, Communication, Creative Thinking, and Collaboration. As students who are engaging with their schools' MSL advance with project based learning and using critical thinking, most will blossom. They will become familiar with how to perceive, reimagine, shape and redefine objects to become something else. They will gain experience using critical thinking and creativity to adapt diverse materials into items with a technological purpose. They will become more successful working in groups to achieve single objectives, an important lesson for future careers. Successive years at the school and more advanced applications and assignments in the MSL will make them better prepared to tackle the next grade group – whether it be middle school or high school. They will become less fearful of the STEAM disciplines by first experiencing them through artistic expression, which often translates into improved test performance, giving them more self-confidence and the experience of achievement.

2BCF has found that its STEAM Lab's combination of non-prescriptive materials, student-centered/project based learning, and innovative sample lesson plans has unleashed the students' creativity around putting STEAM principles into action through the engineering design process. One Title I principle wrote: "Students created marble runs, musical instruments, trebuchets, and catapults while exploring potential vs. kinetic energy and inertia. Students moved forward in creating simple machines and experimenting with magnets. At the end of the year the students worked together to meet the Rube Goldberg Challenge, creating an invention that pops a balloon."

Another Title I Principal talked about the experience his students in younger grades had with the engineering design process: "The third/fourth grade STEM worked on utilizing the engineering and design process to design stationary structures, vehicles/modes of transportation and tried the "Gummy Bear Drop Challenge." Through this process, vocabulary was used to reinforce their learning and students discussed their learning and the constraints for each project. Students discussed successes and ways to improve their designs."

And, a third Title I principal wrote, "Over the past year, staff and students have been using materials from the lab consistently in Project-Based Learning and STEAM based activities. The usage has been in a spectrum from a second grade creating dinosaurs to a kindergarten classroom creating structures, etc.'

If you buy students expensive robotics kits with instructions, they learn to follow those instructions and create a robot like the designer of the package prescribed. O the other hand, if you supply random materials and a space to work in, you nurture creative and critical thinkers who become effective problem solvers. According to the US Dept. of Education, 65% of elementary students in school today will work in jobs that don't yet exist. For that, we will need problem solvers.

The increase in student engagement through MSLs and the impact of our work are evident in our pre-then-post surveys in which we asked the following two questions and received these responses:

What I learn in science class doesn't have much to do with the real world.
Pre - 58% Strongly agree
Post - 15% Strongly agree

I believe I am going to fail science this year.
Pre - 52% Strongly agree
Post - 10% Strongly agree

Schools that do not yet have an MSL can participate in 2BCF's Outreach Events, Field Trips and Professional Development. Field trips of one – three hours can be taken to either 2BCF's warehouse/office in Gardena or to its Micro Amusement park located at the parent company Two Bit Circus facilities in downtown Los Angeles. Visits to the Micro Amusement Park will entail experiencing a variety of STEM-focused games and activities, with a focus on three games and viewing an educational video about how engineers created the games. Visits to the warehouse will involve group activities such as the Rube Goldberg Challenge and an explanation/discussion of the Engineering Design Process. Teachers can participate in ongoing quarterly Professional Development seminars that focus on Project Based Learning regardless of whether or not their school has a Makerspace STEAM Lab. All of these services are priced affordably to accommodate Title I schools' limited financial resources.

While STEAM Carnivals are not addressed specifically in this proposal, we should note that 2BCF stands ready to entertain a proposal from the LAUSD or specific Districts within LAUSD to stage a STEAM Carnival for its schools. A STEAM Carnival is a traveling event that inspires school-age Inventors through Science, Tech, Engineering, Art, and Math. It is a social amusement platform for all ages that uses technology infused games and immersive hands-on experiences to engage and inspire the next generation of inventors. STEAM Carnivals include projects and inventions created by student groups to demonstrate STEAM-related principles, do -it-yourself tables for attendees to create their own STEAM projects, games and exhibits; as well as entertainment and refreshments.

Price Schedule

Two Bit Circus Foundation proposes to offer the services described in this proposal at the following per-unit rates:

Products/Services	Option	Description	Price
STEAM Lab	A- Base Model	Two Bit Circus Foundation STEAM Lab Makerspace: Workbench, 36 bins with materials, shelving unit for project storage, craft supplies, hand tools and power tools. Includes materials membership to restock bins throughout the year and professional development introducing staff to the makerspace.	$10,000.00
	B- Advanced Tools	**Base model**, plus more advanced power tools for higher level production. Includes entry level fabrication equipment, including wood and metal working tools. (Appropriate for higher grade levels.)	$30,000.00
	C- CAD/FAB Equipment	**Base model**, plus advanced fabrication tools and accessories. Includes industry standard Computer Aided Design and Drafting equipment.	$60,000.00
	D- Specialty Equipment	**Base model**, plus Hardware and Software for specific areas of concentration, such as: *General making/woodworking* *Video & Media Production* *Textile Manipulation* *Art & Design Supplies* *Electronics & Robotics* *Virtual Reality Lab* *Music Production*	$25,000.00
Mobile Maker Carts	STEAM Cart	Mobile option for smaller classroom needs. It features 32 bins with materials, a curated toolbox with basic hand tools, a custom cover, and rollable setup for ease of use.	$1,300.00
	NASA Cart	Developed in collaboration with NASA to support the B.E.S.T. curriculum. Cart can easily	$1,500.00

		be integrated with a variety of other STEAM projects in the classroom.	
Professional Development		2-hour PD workshop for teachers/school staff, providing resources for project-based learning with open-ended materials	$1,000.00
Outreach Events	Half Day	On-campus programs for up to 3 hours. (Activity options vary by grade level and group size)	$750.00
	Full Day	On-campus programs for up to 5 hours. (Activity options vary by grade level and group size)	$1,200.00
Field Trips	Warehouse	Field trip to Two Bit Circus Foundation materials warehouse. Includes a 2-3 hour program for up to 40 students. (Activity options vary by grade level and group size)	$600.00
	Micro Amusement Park	Field trip to Two Bit Circus micro amusement park. The 3-hour visit includes a tour of the park for 30 guests, highlighting 3 exclusive attractions and a Club01 show. Additional guests are $10 each.	$850.00

Vendor Virtual Services Plan

Due to school closures, approved vendors on the Partners for Student Success bench that have a signed contract will need to submit their *Vendor Virtual Services Plan* to D'Sonya Oakley at dsonya.oakley@lausd.net from the Office of Partnerships and Grants. The plans will be vetted and shared with eligible schools to select the services they are interested in and follow up with vendors. Any new approved vendors that are in the process of signing their contract will also need to fill out the below form.

Things to Consider:

- Currently, certificated staff are required to supervise any services rendered to students by a third party.
- Recording and pictures of students is prohibited.
- District's Code of Conduct is expected when interacting with students

Vendor's Name: Two Bit Circus Foundation	Submittal Date: 8/7/2020
Schools Planning to Serve: Vine Street Elementary School/ El Dorado El	
List the services in your agreement that can be provided virtually:	Virtual School Workshops
List the services in your agreement that cannot be provided virtually:	STEAM Lab installation
List the platforms you plan to use for delivery of virtual services:	Zoom/Scratch. Scratch is an educational coding program for children. It is web-based and requires no sign in. https://scratch.mit.edu
Provide a brief description of how you plan to deliver each of your services virtually (i.e. coordinate with school to schedule 30 minute session once a week, etc.):	Each of our Workshops will meet weekly for 1.5 hours. The first hour will be instructional while the last 30 minutes will be reserved for sharing and answering student questions.