

PLP Innovation and Technology Opportunity Grant Program Application

Library Name: California State University, Monterey Bay

Project Title: The Maker Kit Program for Home-Based STEAM Education

Select criteria that you are applying under (check all that apply):

- Service that introduces a new idea, program or vision that is not currently used in libraries in response to the COVID-19 pandemic.
- Service that may benefit other PLP members in response to the COVID-19 pandemic.
- Service that may benefit other California libraries in response to the COVID-19 pandemic.

1. Please provide a one paragraph project summary.

The Library Makerspace at California State University, Monterey Bay (CSUMB) provides an inclusive, equitable, and vital cross-campus hub for inquiry-based, hands-on learning. However, during COVID-19 and shelter in place requirements, the Makerspace can no longer provide safe access in person. A cost-effective solution to this dilemma is to create and mail Maker Kits: an assortment of materials for activities previously accessible in person pre-COVID-19. These Maker Kits would provide sample materials for a variety of projects ranging from art to engineering, and include printed tutorials that relate to the materials provided with links to supplementary online resources. These kits will be mailed to any currently enrolled CSUMB student while supplies last. These kits will be offered as a supplement to free online workshops facilitated by the Makerspace. The purpose of the Maker Kits is to increase student access and engagement. Transitioning to hybrid learning or hi-flex learning models would benefit from the continued use of the kits. In person learning would still benefit from the use of Maker Kits as they broaden exposure and increase engagement.

2. Please provide a detailed description of the proposed project including the population served and the demographics of that population.

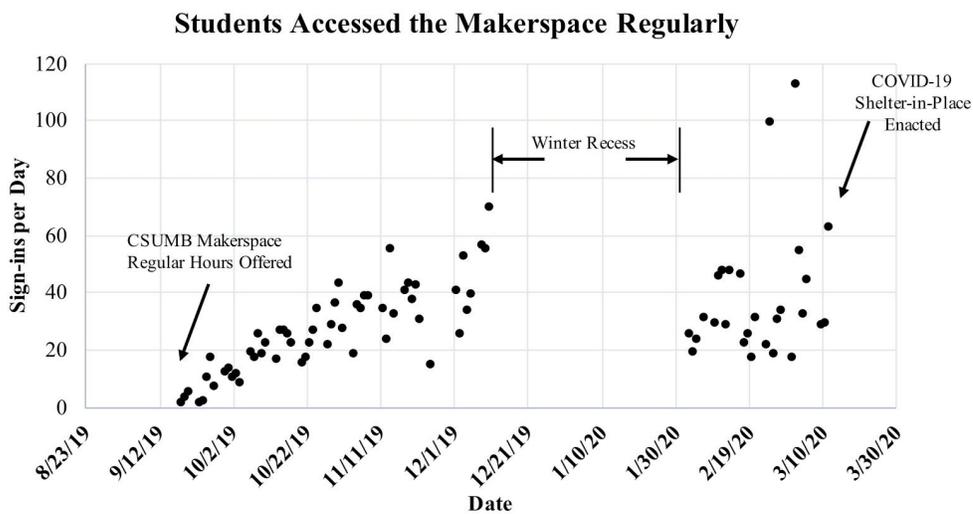
The Makerspace provides opportunities for CSUMB students to engage in creative, innovative, novel, and community-building endeavors through access to supplies, workshops, and other personalized facilitation. Students from nearly every undergraduate major (92%) and some graduate majors at CSUMB (ranging from 3% - 19% of total students within a major) have utilized these opportunities. Data show the inclusivity of CSUMB's diversity (Table 1) and active daily use of the Makerspace in the past academic year (Figure 1).

Table 1:

CSUMB 2019-20 Academic Year Population Diversity		
Race / Ethnicity	CSUMB	Makerspace
African American	4%	7%
Asian American	8%	11%
Latino	44%	38%
Native American	1%	1%
Other/Decline	5%	7%
Pacific Islander	1%	2%
Two or More Races	8%	9%
White	29%	25%
Gender	CSUMB	Makerspace
Women	62%	65.6%
Men	38%	34.4%

Makerspace visitors compared to overall CSUMB student demographics. Demographics represent attendance during the period between December 2019 and the COVID-19 closure of March 2020. Of the CSUMB student body (7416 students), approximately 7% attended the Makerspace one or more times during this period (approximately 34 days open).

Figure 1:



Sign-ins were recorded each day since the Makerspace offered regular open hours (starting 9/18/19). Makerspace usage increased for the on-campus period of the 2019-20 academic year.

Maker Kits would provide equitable access to resources that reflect student preference for project materials, ultimately serving to function as a component for the creation of an off-campus Makerspace equivalent. The contents of the Maker Kits would be samples of STEM/STEAM materials readily available and frequently used in the Makerspace. Analysis of Makerspace usage preferences during the Spring 2020 semester showed ~41% of students utilized materials (e.g. paper, pens, paint) included as Maker Kit components (see budget). The kits would additionally include printed tutorials as a means to provide Makerspace services for those with limited access to the internet. Each kit contains materials for several projects ranging from paper circuit components as a means to introduce basic electronic theory to art supplies to practice and understand design elements and principles. The kits will be tailored to all skill levels through the use of printed tutorials and other resources. Ultimately, Maker Kits would allow hands-on activities – the essence of the Makerspace – to be accessed safely during the pandemic.

The population served by the Maker Kits are CSUMB students currently enrolled for the Fall 2020 semester. Data from September through March of 2020 show an increase in overall usage by student drop-in visitors, faculty with their classes, and campus groups including sports teams and student organized groups. Attendance to the Makerspace has been similar to the overall student demographics represented by the school population (see Table 1 above). Please see [CSUMB's Enrollment Fast Facts](#) for additional information regarding the CSUMB student body.

3. What are the goals and objectives of the project?

Goal: Re-establish the hands-on pedagogy essential to Makerspace functionality.

Objectives:

- Provide equitable access for students to supplies, workshops, and related support services that would remain relevant after transitioning back to relative normalcy
- Allow exploration and experimentation of materials on an individual level
- Open up collaborative community endeavors through networking as part of an online community of Makers
- Empower students to proactively further their interdisciplinary education
- Cater to students across multiple disciplines and skill levels

4. Explain how this project fits with the library's strategic directions.

The [CSUMB Library's Strategic Plan](#) recognizes the Makerspace as a priority for innovation and discovery. In addition to supporting the Makerspace, the Maker Kits support the strategic direction of the Library in the following ways:



- **Access** – Maker Kits provide the student community the opportunity, support, and tools to engage meaningfully with a variety of information resources relevant to their academic, intellectual, and creative endeavors.
 - **Innovation** – Maker Kits provide resources in response to anticipated users’ evolving needs (especially in response to COVID-19), and provide a more satisfying, efficient, and successful Library (Makerspace) experience.
 - **Learning** – the Makerspace celebrates inquiry, critical thinking, and the pursuit of knowledge to develop deeper understanding through hands-on pedagogy facilitated by Maker Kits.
 - **Continuous Improvement** – the Library Makerspace strives to create a culture of continuous improvement in which we seek and use feedback, make decisions based on evidence, and embrace learning opportunities that advance professional and organizational growth. Quantitative data will be collected at registration for the Maker Kits, and follow up surveys will collect qualitative data after the kits have been used to incorporate feedback and improve Maker Kit users’ experience.
5. Please include your project timeline (include detail of activities).
- September 2020:** Grant notification
- September 2020:** Kit registration available
- October 2020:** Kit supplies packaged and distributed
- December 2020:** Kit follow up survey emailed to assess success of kits.
- January 2021:** Feedback from survey analyzed in preparation for new kits (Spring 2021)

6. Please include your project budget. (Note: Indirect costs are not allowed).

Each Maker Kit costs approximately \$10 including postage (\$3 shipping and postage, \$7 Maker Kit components). For \$5000 the Makerspace can procure supplies, cover the cost of postage, and provide 500 students with Maker Kits.

Maker Kit Component Breakdown	Cost
STEM – LEDs, paper circuit tape, coin batteries	\$1.10
Art Supplies - Design Elements and Principles 2D – graph, painting, & drawing papers, pencils, pens, paint, paint brushes	\$4.75
Art Supplies - Design Elements and Principles 3D – paracord, buckles, keychain rings, macrame cord, origami paper	\$1.15
	Total Kit Cost \$7

Total Cost 500 Kits	Per Kit	Total
Maker Kit	500 x \$7	\$3,500
Maker Kits Shipping and Packaging	500 x \$3	\$1,500
		\$5,000

7. Please indicate how you will evaluate success of your project.

The Makerspace uses data to evaluate the efficacy of its programs and services. Google Form surveys will provide a data-based means of tracking quantitative information on the population being served by the Maker Kits over the course of the Fall 2020 semester. Follow up Google Form surveys will be emailed approximately 1 month after participants receive the kits to assess their qualitative experience. Data from workshops will be collected and analyzed. Workshops will include short, unobtrusive polls assessing qualitative factors. Surveys will be sent out assessing the strengths and weaknesses of the coordinating workshops. These surveys will collect additional feedback that will be incorporated into future workshops. Outreach campaigns will be expanded to target any missed populations.

Student data accessed through the Institutional Assessment and Research Department will be used to analyze demographics of the students using the program. Demographic data of students requesting the kits will be compared to the demographics of the entire student

population. These data will provide a means of tracking the use and success of the Makerspace Maker Kit program and inform needs for future Maker Kits to better serve CSUMB's student population. Students will be encouraged to submit photographs of their Maker Kit projects and their work will be digitally archived on the Makerspace website.

8. Please indicate how the project will be sustained after the grant term is over.

Pending success, Maker Kits will remain a permanent feature available to students as a means of both outreach and equitable access to supplies. A Makerspace strategic plan has been created which addresses continued funding and a strategy for the growth and success of the Makerspace for the next 5 years. In collaboration with the Colleges of Science and Education, several grant applications are in process that could aid in the continued operation of the physical Makerspace and fund purchases of Maker Kit materials and postage. Internal CSUMB grants had been awarded to the Makerspace before the pandemic, and negotiations to use these funds to provide kits may become possible if the program is shown to be successful based on Fall 2020 data.