

Library Makerspace Program

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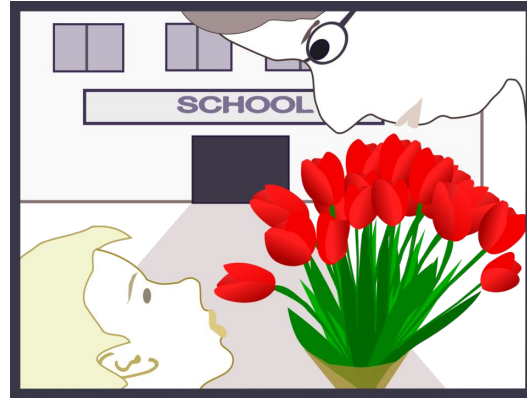


Program Objectives



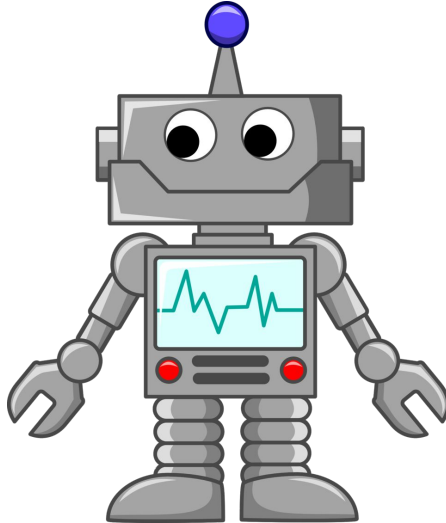
Objective 1

Focus on creating and delivering quality learning experiences for students and teachers.



Objective 2

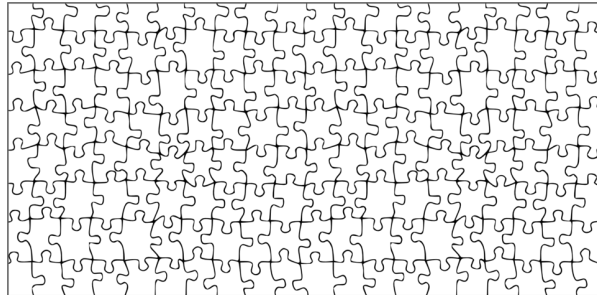
Create curiosity and excitement around technology and design.





Objective 3

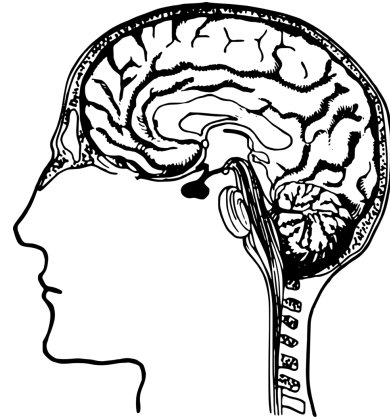
Provide pathways for students and teachers to be creators and inventors in individual and social learning contexts.





Objective 4

Empower teachers to create and deliver makerspace activities that integrate invention, creativity, making and problem-solving.





Objective 5

Provide extensions to the curriculum.

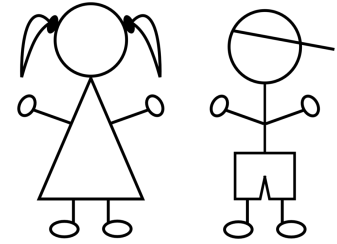




Target Audience



All students grades 6-8



We want to open the makerspace to all middle school students so that they can engage with technology, create, learn, explore, think, and problem solve.



Standards





International Baccalaureate

Learner Profile:

Open-minded

Risk-takers

Inquirers

Thinkers

Approaches to Learning:

Thinking skills

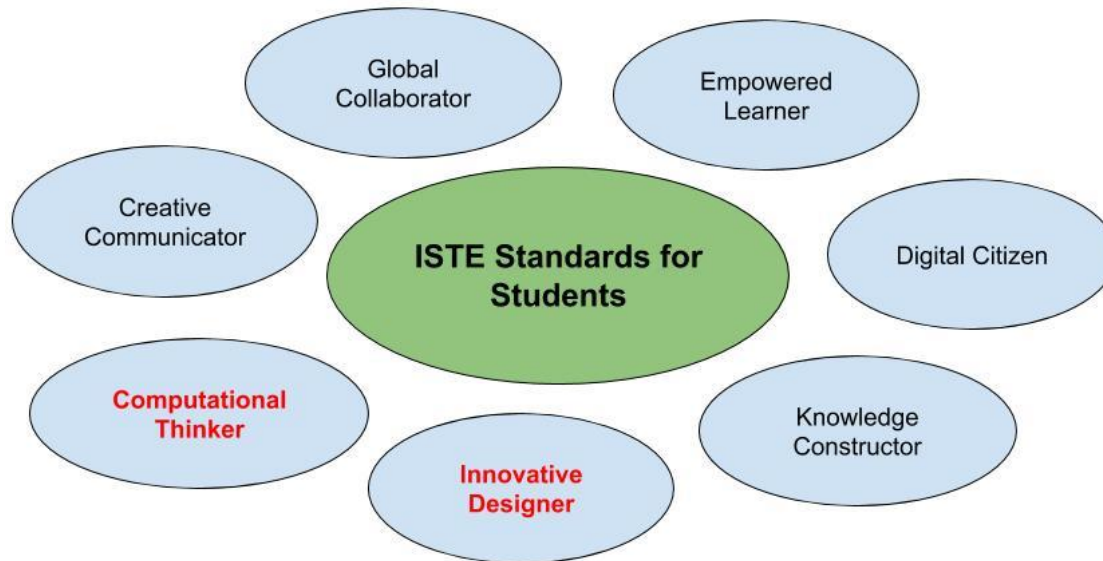
Self-management skills

Research skills



ISTE Standards for Students

The makerspace addresses multiple ISTE Standards directly, including deep learning experiences contributing directly to developing students Innovative Designers (Standard 4) and Computational Thinkers (Standard 5).





Budget





Phase 1 Expenses

Makey Makey Station Kits (4) \$200

Lego Building Center (1) \$200

Low-Tech Making Materials \$300

Squishy Circuits Deluxe Kits (5) \$357



Phase 1 Expenses

Locking Cabinets (3) \$1000

Makerspace Books \$100

Storage Bins \$100

Miscellaneous Items/Consumables \$500



Phase 2 Expenses

Strawbees Coding & Robotics Kit \$695

Sphero Sprk+ Robot (2) \$300

3 Doodler 3D Pens (5) \$200

The background is a solid orange color. In the top-left corner, there are three vertical bars of varying heights, each composed of several overlapping semi-transparent orange circles. In the bottom-right corner, there are four vertical bars of increasing height from left to right, each also composed of several overlapping semi-transparent orange circles.

Benefits of the Program



Four Dimensions of Making Activities

Research indicates that when tinkering/making, the user shows the following:

1. Engagement
2. Initiative and intentionality
3. Social scaffolding
4. Development of understanding

Researchers further observed users taking an interest in the activities, coming up with ideas, communicating with and helping each other, and verbalizing new understandings (Bevan, Gutwill, Petrich, & Wilkinson, 2014).



Social Learning

Providing a makerspace in a school setting allows and encourages students to take what they learn in class and apply it in their own way on their own terms, deepening their understanding of core concepts (Sheridan et al., 2014). It also provides opportunities for peer mentorship and collaboration.



Career Considerations

Engaging students in makerspace activities that ignite their interest has the potential to inspire more students to consider STEM careers (Tofel-Grehl et al., 2017).



Measuring Impact





Measuring Impact

Quantitative Data

- Test scores
- Attendance data

Qualitative Data

- Student & teacher surveys
- Online suggestion box
- Photos & videos





Test Scores

Measuring impact of the makerspace must connect to the goals of the makerspace. Several of the goals of this makerspace focus on quality learning and extending and supporting the curriculum. Therefore, one measure of impact will be analyzing standardized test results from the year prior to opening the makerspace and the year after. The makerspace may take time to impact students' growing and changing minds, so it may be several years before a noticeable change is evident.



Attendance

Another way we will measure the impact of the makerspace is by keeping track of its attendance numbers. This will be accomplished by a simple headcount each time the makerspace is open and recording it on a tracking document. This would best be performed by a library paraprofessional or student aide.

A	B	C	D	E	F	G
Week of:	Number of Students Visiting the Makerspace					
__/__/__	Monday	Tuesday	Wednesday	Thursday	Friday	Totals:
Before School						0
Lunch						0
After School						0
					Weekly total:	0

Suggestion Box

The committee will also measure impact through an online “suggestion box” for students to submit ideas and opinions about how to improve the makerspace as they wish. This will be done through a google form with the link posted in QR codes around the makerspace. This will aid in our selecting materials for phase 2 and for the future.

Makerspace Suggestion Box

Form description

Image title



Please share your ideas about how to improve the library Makerspace:

Long answer text



Student Surveys

The most important feedback we want from students will take the form of a survey. We will ask that students answer the survey when it is their first time using the makerspace. This will be in the form of flyers with the link/QR codes at the beginning, then have a dedicated computer with the first time survey pulled up as students become more regular users. We will then ask students to take a very similar survey at the end of phase 1 to provide results. We will then send the survey again at the end of phase 2.

First Time Makerspace Survey

Answer this your first time using the makerspace!

How much do you know about coding and programming? *

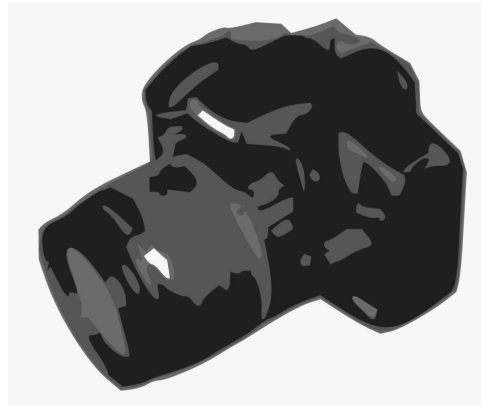
	1	2	3	4	5	
None/very little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A LOT

How comfortable do you feel using the makerspace? *



Photos

The librarian will also take photos and upload them to the library website and share via school library social media platforms to help promote the makerspace. The photos can help show which resources are being more frequently used.





Reference List

Bevan, B., Gutwill, J. P., Petrich, M., & Wilkinson, K. (2014). Learning through STEM-rich tinkering: Findings from a jointly negotiated research project taken up in practice. *Science Education*, 99(1), 98-120. doi:10.1002/sce.21151

Sheridan, K. M., Halverson, E. R., Litts, B. K., Brahms, L., Jacobs-Priebe, L., & Owens, T. (2014). Learning in the making: A comparative case study of three makerspaces. *Harvard Educational Review*, 84(4), 505-531.

Tofel-Grehl, C., Fields, D., Searle, K., Maahs-Fladung, C., Feldon, D., Gu, G., & Sun, C. (2017). Electrifying engagement in middle school science class: Improving student interest through e-textiles. *Journal of Science Education and Technology*, 26(4), 406-417. doi:10.1007/s10956-017-9688-y



Credits

Clip art Images collected from publicdomainfiles.com

ISTE information collected from <https://www.iste.org/standards/for-students>

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