

Makerspace: Bringing Creative Thinking to the Classroom

By [Melissa Schwartz](#) May 4, 2016 ·

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What do Apple, Google, and Facebook have in common? Not only are they hugely successful companies, but they also use the Makerspace model to create their ideas and products. A Makerspace is a collaborative environment in which people can plan, think, create, and re-develop ideas together.

Makerspace was born out of the idea that when people are given time to discuss, plan and create, amazing ideas are born. It's directly associated with STEM (Science Technology Engineering and Mathematics) and with this method of instruction, students will prosper as innovators of the future. As educators in the 21st century, we can use this concept in our classrooms to help foster creative thinking.

Makerspace Challenges

Students are given the space and time they need to think and create in a Makerspace. In order to create this environment for your class, provide everyone with both a place to plan and materials to carry out the plan that's conceived by your students.

Challenge your class to use their creativity to tackle simple problems or tasks using only household items. One great example of this is called Stack 'Em Up. In this challenge, students work in groups to design and build the tallest tower they can envision, using only paper or plastic cups. To get everyone started, provide the groups with 50 to 100 cups, ranging from 9 oz. to 16 oz. each.

Another example of a Makerspace challenge is called Marble Boat Float, in which students build structures with various materials to create the object that can hold the most marbles while floating in water. Give your groups paper towels, wax paper, aluminum foil, cardboard, modeling clay, rectangular clear containers (the size of shoe boxes) and marbles. Set out a tub of water and have students conceptualize, build, and test structures that allow the greatest number of marbles to float.

With these challenges and others like them, students practice collaborative innovation and foster creativity to solve problems with simple materials — building skills that are useful in the classroom and beyond. Check out the other ideas for Makerspace projects listed at the end of this blog.

How to Create a Makerspace at School

Establish the Space

Find a space in your school that you could use to solely be the Makerspace. This could be an extra classroom, the technology room, or any area with tables and chairs that can easily be moved. Having moveable furniture

allows you to create different groupings of students. In this space, students can store their materials in containers or cubbies, since desks won't be used for individual storage. If an extra room isn't available, consider creating a mobile Makerspace. Purchase a cart to house the materials for STEM/STEAM activities for each grade level, and simply turn the classroom that's using the cart into the temporary Makerspace. Extra materials that don't fit on the cart can be stored in a Makerspace closet.

Gather Materials

Inexpensive materials work well in a Makerspace. For elementary school students, collect household items such as paper towel rolls, tape, glue, paper, cups, plates, bowls, popsicle sticks etc. Determine the type of project you'd like younger students to create, and provide them with constraints regarding the materials they can use. Older students can determine the best materials they can use to create their products. For more information about materials and constraints, check out my post about integrating STEM into the 21st century classroom.

If you have access to them, additional materials could include computers, tablets, 3D printers, OSMO, projectors, interactive whiteboards and robotic materials. Since STEM/STEAM is the new push in education, many businesses will donate these items to your school, or give them to you at a discounted cost. Your local hardware, home improvement and food stores are great places to request donations.

Teach Creative Thinking

In Makerspaces, the creative thinking skills acquired by students are much more important than the products they create. To emphasize this, address design thinking before your students dive into planning their product.

One effective way to do this is to have your class complete short "design challenges" that take 15 to 30 minutes. For example, I recently challenged my students to create Wacky Windmills using materials such as straw, different types of paper, paper clips, and brass fasteners. Before beginning, each person in a group developed a sketch of a design, complete with material labels. Then, they discussed their designs as a group to determine which ones might work. After agreeing on which designs to move forward with, students created their windmills and modified as needed.

Though they created amazing windmills, the most important part of this project were the skills that my students developed through the design process. Learning how to reflect about what worked with their design and how they could make it better is an important life skill that can be applied and refined on future projects. Giving students a chance to practice design thinking before heading into the Makerspace allows you to act more as a facilitator, rather than the teacher.

Using a Makerspace is a wonderful way for our 21st century learners to become our innovators for the future. Help your students become the next Steve Jobs, Mark Zuckerberg, or Bill Gates by teaching them to become thinkers and tinkers!

Resources to Help Create Your Makerspace

- [Makerspace Resources](#) at Renovated Learning
- [Designing a School Makerspace](#) by Jennifer Cooper
- [Defining Makerspaces: What the Research Says](#) at Renovated Learning
- [Setting Up Your Own Makerspace](#) by Lewis and Clark Learns

Makerspace Projects

- [Brown Bag STEM Challenges](#) by Starfish Education
- [The Ultimate STEM Guide for Kids](#) by Master's in Data Science
- [Integrated STEM Ed](#) by the University of Arkansas
- [STEM Challenges](#) by the James Dyson Foundation
- [22 Customizable STEM Project-Based Learning Activities](#) by Global Digital Citizen Foundation
- [STEM Challenges](#) by Practical Action

Makerspace Books to Get You Started

- *Invent To Learn: Making, Tinkering, and Engineering in the Classroom* by Sylvia Libow Martinez and Gary S. Stager
- [Makerspace Playbook](#) download
- *MakeSpace: How To Set The Stage For Creative Collaboration* by Scott Doorley and Scott Witthoft
- *The Maker Movement Manifesto* by Mark Hatch
- *The Art of Tinkering* by Karen Wilkinson and Mike Petrich
- *Worlds of Making: Best Practices for Establishing a Makerspace for Your School* by Laura Fleming
- MAKE Magazine
- [MASL 2015 Presentation](#) by Fisher, Riedel and Rosheim
- *Tinkerlab: A Hands-On Guide for Little Inventors* by Rachelle Doorley

About the Author

Melissa Schwartz, still a kid at heart, is a fourth grade teacher in an elementary school in Northern New Jersey. As a teacher for over ten years, she provides her students with the gift for the passion of learning. She prides herself in teaching lessons that are interactive, educational, and fun. Melissa received a dual degree in both elementary and special education at the University of Delaware. She also received a Masters Degree as a Reading Specialist and Supervision at Fairleigh Dickinson University. In addition to teaching fourth grade, she has taught third grade, gifted and talented, and special education. She also received the honor of “Teacher of the Year” during her second year of teaching! Melissa also has a passion for traveling, history, reading, and a love of her dog, Maggie.