

Paxton High School 3D Printing Grant Report

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Thanks to your grant, I was finally able to bring 3D printing to my classroom! At the same time I wrote a grant proposal to your organization for a Makerbot Mini, I also wrote a grant to another generous organization for a Makerbot Mini. I wanted to make sure if one fell through, I would have a back-up plan for providing 3D design and printing to my students this year. As it turns out, I was awarded both grants, so I was able to combine the funding to purchase a much larger Makerbot 3D printer that will enable my students to print much larger items to solve problems and share their creativity.

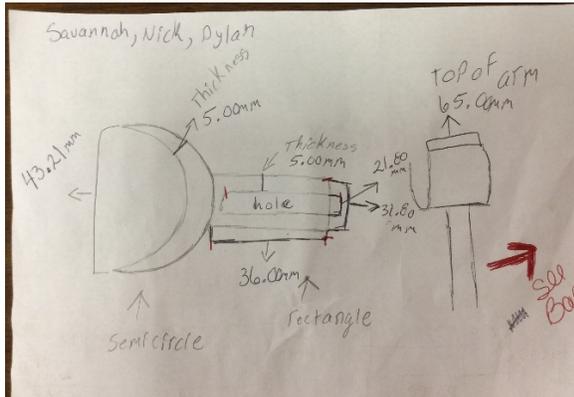
Since that time, multiple groups of students have utilized Tinkercad to design objects that were later printed on the 3D printer. First, my middle school critical thinking students learned about 3D printing through a series of lessons regarding current use of the technology, how 3D printers work, and acquiring a common vocabulary common to the technology. Students then learned the basics of additive and subtractive design by using play-doh to make additive and subtractive shapes. After acquiring the requisite background knowledge, students began to learn how to use Tinkercad, an online 3D design program through various tutorials. Finally, students used their new knowledge to try their hand at their own designs. As a culminating project, students designed keychains, each of which were printed for the students. Many of these same students will be in my class again next year, and it is my hope to continue their design experience with more robust, real-world problem-solving projects.

Second, my aerospace students participated in an annual underwater robotics competition called Seaperch. Students designed and built their underwater robot that would later be used in a regional competition. For one part of this competition, students were required to create an arm with a claw-type device that could grab a pipe and slide it across a ladder type device that was located under water. Students hand drew the perfect claw that they wanted to use for their robot utilizing digital calipers to gather accurate measurement data. They then designed the claw in Tinkercad and printed it on the Makerbot 3D printer. One of the groups that utilized a 3D designed and printed claw went on to win third place out of 70 teams in the finesse portion of the Seaperch challenge.

Not only is it my desire to continue the utilization of the 3D printer in my classes next year, but it is also my plan to find ways to utilize the 3D printing technology to inspire elementary students as well. Among my plans are to schedule visits from elementary classes for a presentation and to watch the printer in action, then give the class the 3D printed object for use in their classroom. This might be something usable like a hall pass, or perhaps a science model for an upcoming lesson. I also plan to use the 3D printer at our science night held each fall, so that students of all ages and their parents can view samples of items designed and printed by my students and watch the printer in action.

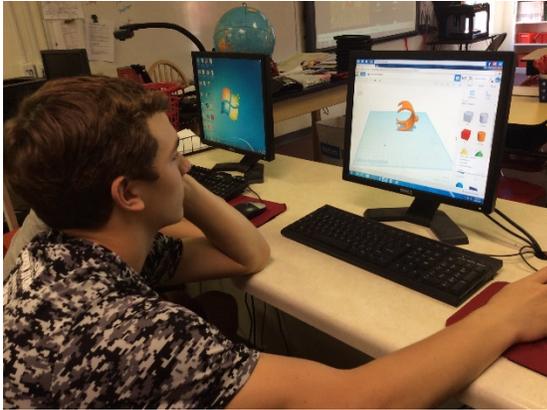
Please accept my heartfelt gratitude for your contribution to expand STEM education at Paxton School! On the following page I have included photos of some of the students' work with the 3D printer.

Designs for the Seaperch claw.

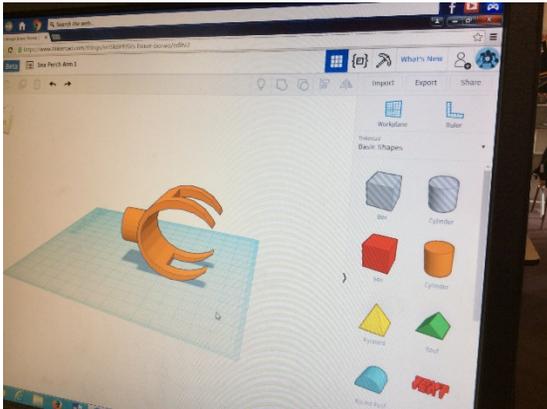


Design printed.

Student designing the claw in Tinkercad.



Tinkercad design.



Printing the claw on the Makerbot.



Design fitted on the Seaperch robot.



Students went through multiple renditions of the claw before they settled on the design to be utilized in the competition.