

Making with Professional Makers

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ABSTRACT

At the school we work with a professional maker from New York University, David. We make different projects, a piano, a interactive coral reef and an interactive part of the ocean. We create it as part of our personal projects and as part of a class where David was a teacher. We learn how to work with people that are not teachers and we learn how to think of ideas for a project, how to make motors work and how a breadboard work. It is important to work with professional makers because they have a lot of expertise in what they do. We think we can learn even from people that are not in just in schools. Also teachers in the school don't know everything, so people outside the school can help. It was challenge for us when someone from outside the school works with us but we like the challenge. This experience is important because it can motivate other schools to bring makers from outside the school to help create personal projects or teach classes.

Keywords

Makey-makey, arduino, laser cutter, programming, professional makers

1. PROJECTS

Pianos: I made a piano out of wood that I laser cutted. Mine was different cause it's theme was hamilton. Hamilton is a Broadway play explaining the life of a man named Alexander Hamilton. Hamilton was George Washington's right hand man, George Washington was the first president of the United States. I wanted to make my piano Hamilton themed because I was so obsessed with the songs. I loved to sing Hamilton with my friend. My favorite characters were Angelica, Peggy and Eliza. I'm also a fan of a character called Aaron Burr a rival of Hamilton. I also like Hamilton himself. I laser cutted those pieces. When my piano was working whenever I pressed the piano it would play either the sound: "Angelica", "Peggy", "Eliza", "Hamilton" or "Aaron Burr sir". When you pressed a different key than one of the laser cutted pieces would pop out. In the back there was a miniature LED with a switch I scooter all together. So I basically made a piano that whenever I pressed a key one of the lasercut characters would pop up and play a part of the song they sung.

Coral Reef and Deep Ocean: I made with my friends a reef. It had the sunken Titanic, a squid, a volcanic eruption. It was motorized. I like I made a submarine with a light on it and when you put your head in the box it lit up and when you pressed buttons, the other LED lights lit up inside the box that looked like the deep ocean. We cut a black box with a knife and made The Titanic with a volcano, an angler fish, an octopus and a mini boat. You can see a video of the exhibition night here: https://www.youtube.com/watch?v=M_PdEpXTyR4&t=1s

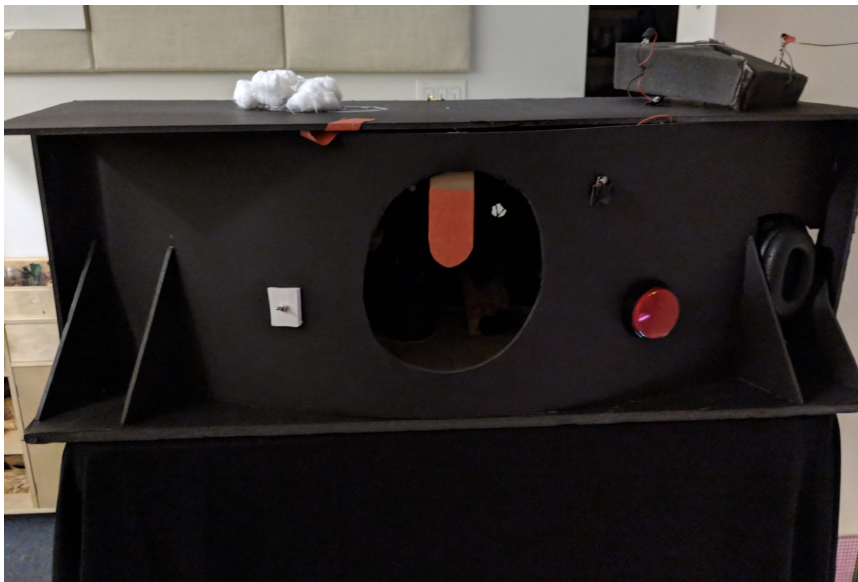
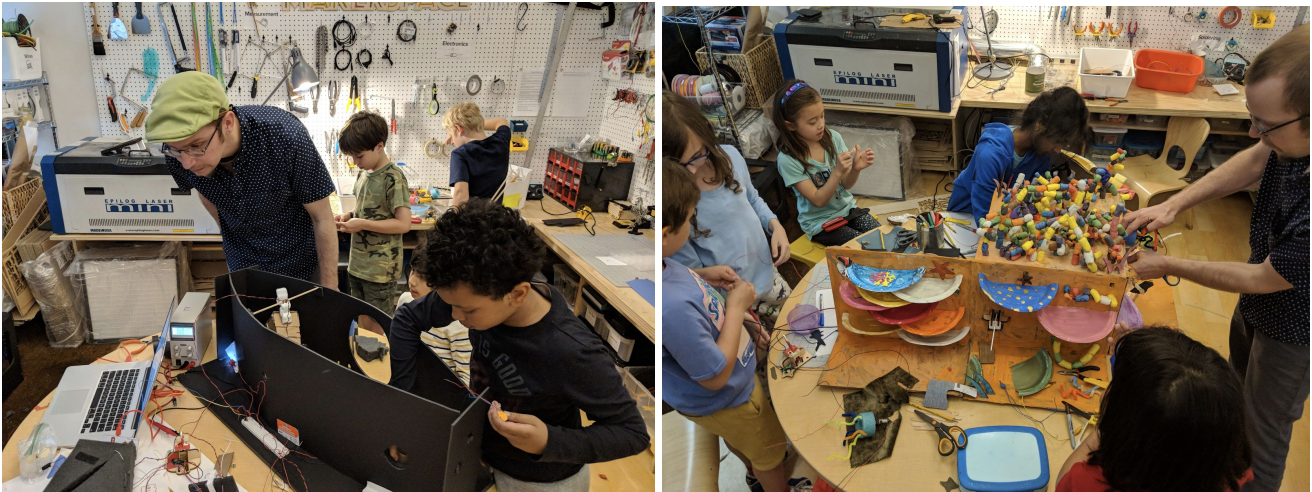


Figure 1. On the right it's the interactive coral reef and on the left the artificial deep ocean world

1.1 Working with a Professional Maker

We liked working with David because he was really nice and gave us motivation on what we wanted to make. For example: one of us wanted to make a marble run piano and David gave us ideas about it and then that person made a really funny one. David was collaborative. He wouldn't just tell us how to do something and then we would do it, we would figure out together. Also he was good at problem solving. Whenever we did something that had not work we would figure it out under David's guidance. He was good at teaching and taught us lot's about how electronic robots work. David was knowligible in what he was doing. He gave us challenging things to do like designing horses in inkscape. Inkscape is an app that lets you design things out of shapes and then you can cut the shapes with the laser cutter. Then we cut them out of fabric and made shadow puppets and made a show which we video taped.

Because David is not a teacher it was important to help him in class by not distracting other children and participating. Also he sometimes didn't know what we understand or can do so it's important to tell a professional maker about those things.



1.2 Learning with a Professional Maker

We learned how to make a piano and how to fabricate things which you can think of. For example I thought of making a funny piano and I wanted it to have something to do with a marble run and we made it funny and it had something to do with marble runs. We learned from him how to wire the breadboard (boards that have wire connections so you can connect wires together), how to use wire cutters (cutters that strip wires easily), about positive and negative, how to make LED lights light up, connecting the wires between the leds and the breadboard. Also we learned how to use inkscape to make the cardboard body of the titanic. We also learn about the projects that David did outside the schools and the things he likes. That was very important for us because we can see projects were what we were learning was used.

We can also teach David things. The Rube Goldberg piano (a piano that makes different sounds when a marble hits places of a Rube Goldberg machine) inspired David to make a sound Rube Goldberg machine that he displayed in the window of an NYU building.

1.3 Making the Project

Making the project we learned how to use electronics, how to use equipment safely, how to work with community and more about the zone the coral reef was in. We learned that it wasn't easy to program our Amazon Alexa right out of the box, how to make a piano and that you can do anything if you try to do it. We learn that you need switches to turn The Underwater Volcano on and off and that you can use motors to move stuff (motors can move only with a battery because they need energy).

I was very exciting finishing the coral reef because it was very hard to do. It was hard because there were many wire connections and big lights on it that were controlled by an Amazon Alexa. It was challenging working with wires because we had to figure out which wires go where. We overcame that because David explained to me where the wires go. To connect wires on the breadboard was also challenging because you had to twist it- it was physically difficult, but also challenging mentally- to remember which connected where Another hard part of the project was thinking of what we were going to make.

2. CONCLUSION

It is important to work with makers because they have a lot of expertise in what they do. We think we can learn even from people that are not in just in schools. Also teachers in the school don't know everything, so people outside the school can help. It's a challenge for us when some from outside the school works with us but we like the challenge.

David was strict. He lets us do, he lets us create, he lets us make up our ideas and make them on our own, but helps us when we need it. David challenged me and I used my growth mindset to overcome these challenges.

3. BIOS

Anjali and Lucas 5th grade, Aiden, 4th grade, Eamon and Ashley 3rd grade, Orion and Nicholas 2nd grade.