Introduction

This assignment was the assembly of our prototype 3, testing the prototype 3 to meet our objectives for the prototype. We also want to review feedback from the last meeting in our last where we did our final presentation to see if we can improve the design based off that feedback. Based off that feedback it will also benefit us on design day to show our client a better final solution.

Review of last meeting

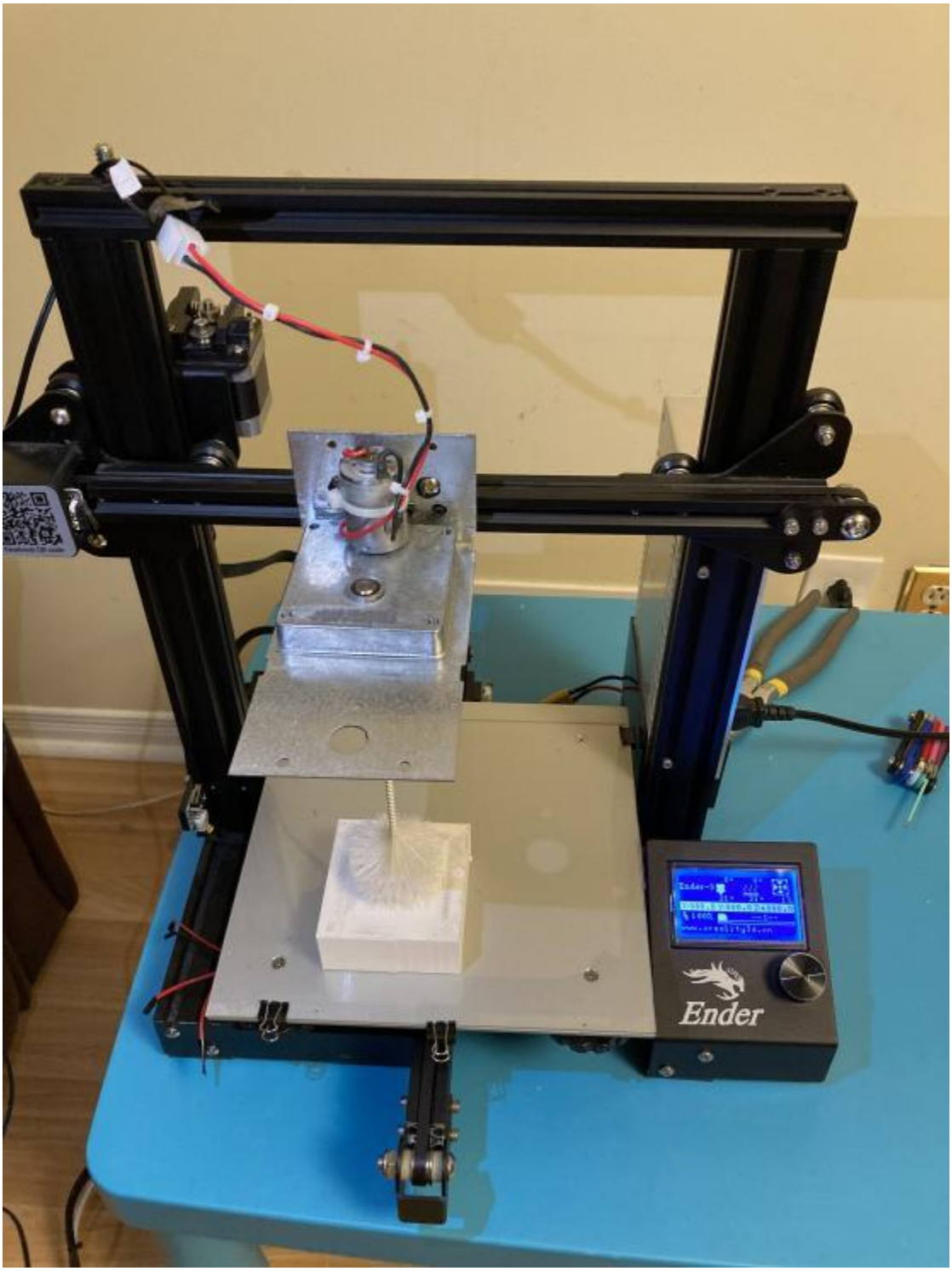
The last meeting was mainly presenting our progress over the whole semester, but we still had received some feedback which we will put into consideration. There were many questions about our stacking system and how they will work. We put this feedback into consideration and redesigned our wedges to work better, they now have a sharper angle to cut into the boards, and a better way for when we turn the wedges into the system. This new design increases the height difference between the bottom board and the next one by 0.5in, which gives it enough space to pass through, the wedge also has a 0.1in indent in it to prevent the wedges from contacting the bottom board letting it pass through. We also had feedback over the fidelity of the prototype 2 test, which was the mud may not be similar to the algae, and that we didn't test the time it took. We will be modifying prototype 2 to get time metrics, and to see if it can clean algae.

Prototype 3

- Focused, physical, medium/high fidelity
- Materials:
    - 12V dc gear motor
    - L metal bracket
    - 3d printer
        - 5 steel metal bars
        - 3d printer battery
        - Cable to power printer 3d printer display and 3 servo motors for x and z axis movement.
        - Belt to move on x axis
        - Metal spiral to move on z axis
        - 9 small wheels that move on the 2 axis
    - 2 screws to secure motor on 3d printer and 4 more screws to secure motor on L bracket
    - External power supply for 12 V motor
    - brush
- Objectives
    - Ensure motor and brush moves left/right and up/down
    - Ensure motor has enough power to spin the brush when its in the raft hole
- How prototype was built
    - Disassembled extruder from 3d printer to create the surface where the motor will be attached
    - Got a large aluminum L bracket and drilled wholes in it to attach motor to surface where 3d printer extruder was
    - Drilled hole in brush to attached brush to motor and super glue brush to motor
    - Held 3d printed raft hole to see if brush has power to clean hole

- Results:
    - The 12V dc gear motor has enough power to spin while the brush is in the raft hole. It is a significant improvement from the results we got trying the same experiment with a 3V dc motor (the 3V motor didn't have any power to rotate the brush when it entered the raft hole).
    - The 3d printer was able to easily move the motor in the x and z axis.
    - Total time it takes for brus clean hole (which includes moving to hole, descending in it, spinning, and then exiting hole) is around 10-20 seconds
- Transfer of knowledge: we knew the 3V DC motor we had used in prototype 2 wouldn't have enough power to spin the brush when its in the raft hole so we got a stronger 12V motor. We also got a smaller brush since the first one was too large to fit in raft holes.

Prototype 3 Photos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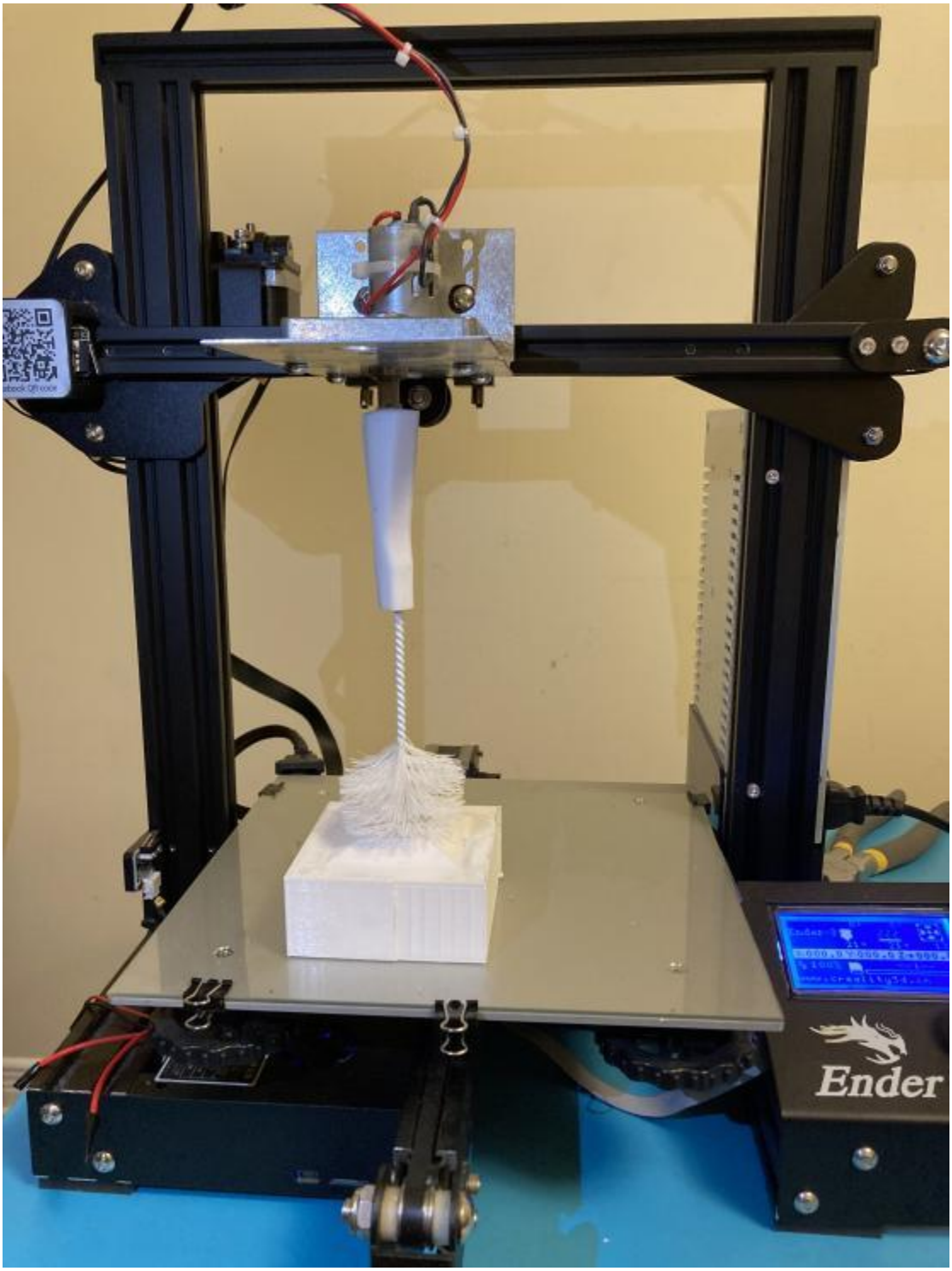
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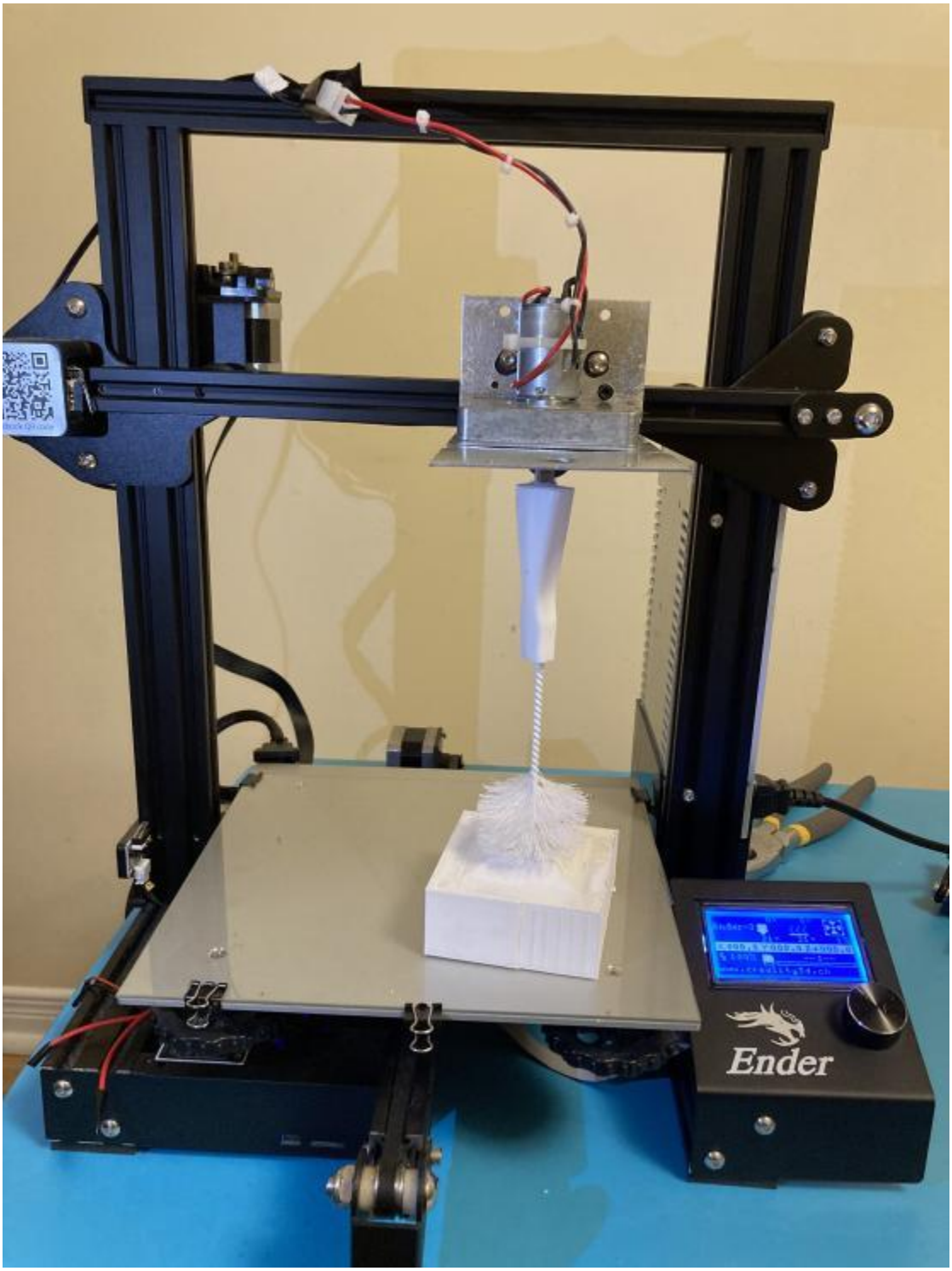
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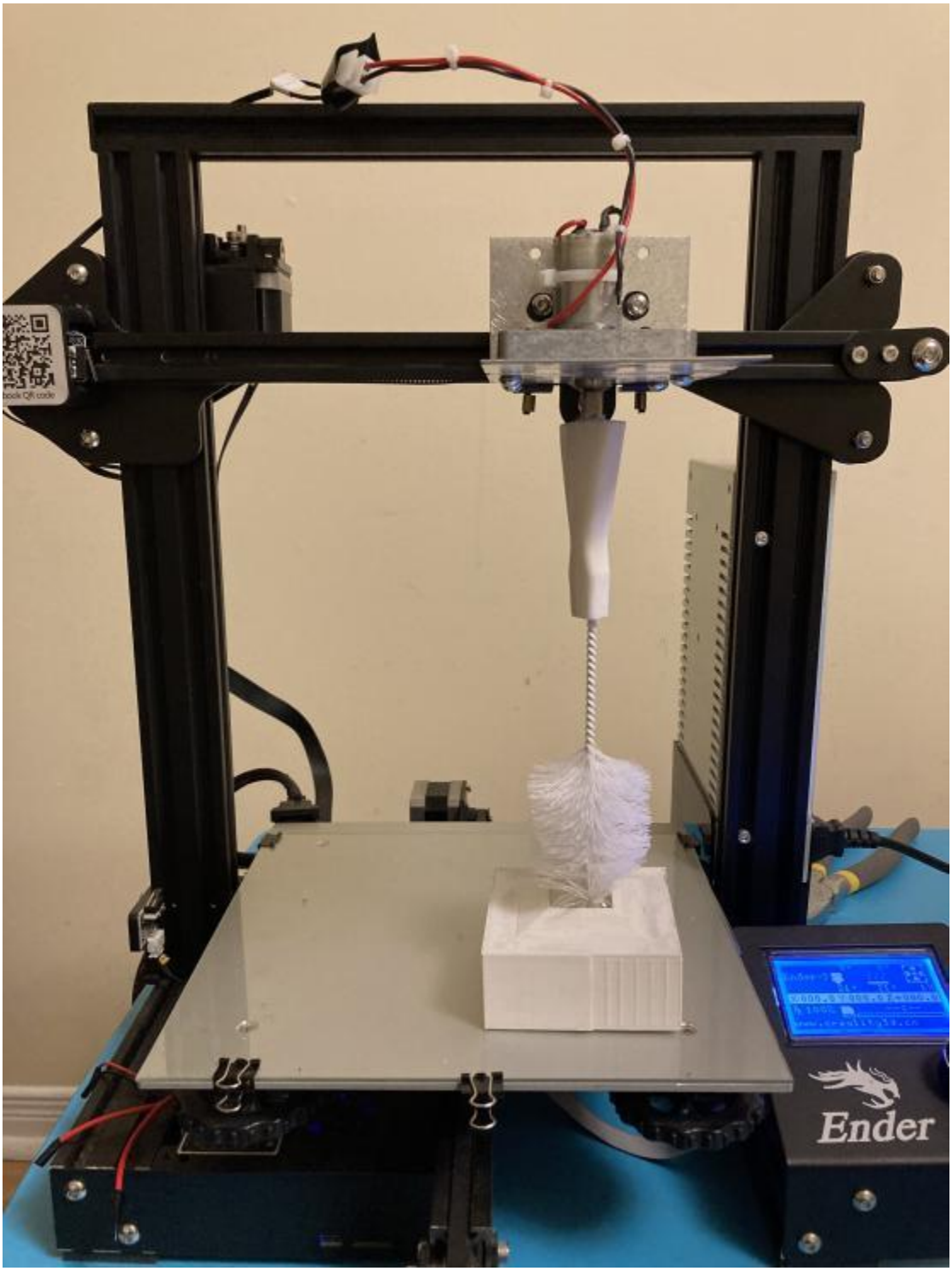
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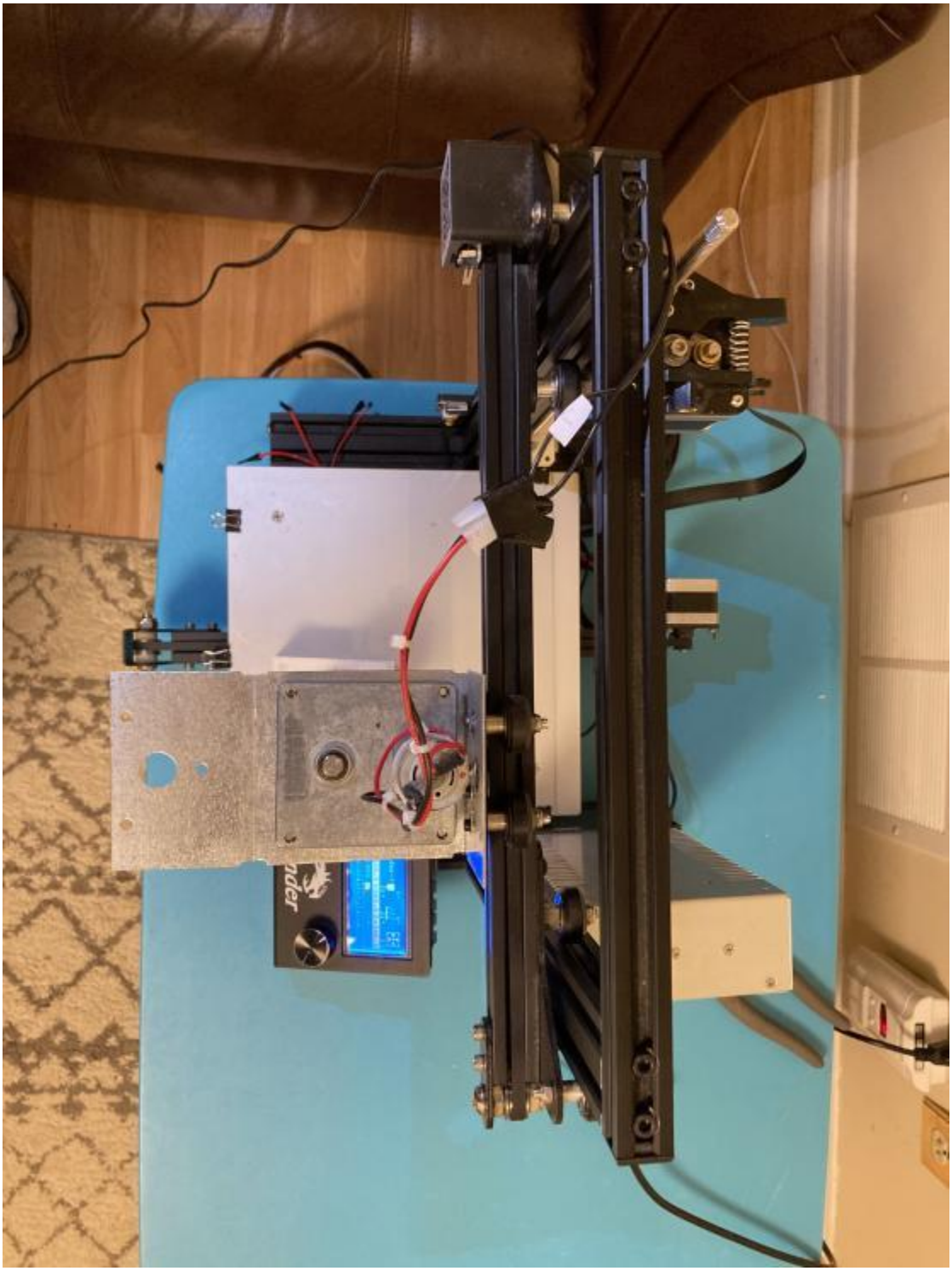

Project Plan (Green are completed, dependencies can be found on wrike)

Tasks	Duration	Who's Responsible
Prototype 1		
Create test plan	Start 10/21 Due 10/23	Gabe

Plan assembly of prototype one including all parts we will need	Start 10/21 Due 10/25	Gabe, Sharmarke, Aiden
Gather Materials for prototype one	Start 10/23 Due 10/30	Gabe
Assemble Prototype One	Start 10/30 Due 11/2	Gabe, Sharmarke, Aiden
Test Prototype One using our test plan	Start 11/3 Due 11/3	Gabe, Sharmarke, Aiden
Analyze Test results	Start 11/3 Due 11/5	Gabe, Sharmarke, Aiden
Prototype 2		
Review Feedback from prototype one	Start 11/10 Due 11/10	Gabe, Sharmarke, Aiden
Create Test plan	Start 11/1 Due 11/6	Sharmarke
Plan assembly of prototype two including all the parts we'll need and how we will assemble it together	Start 10/23 Due 11/7	Gabe, Sharmarke, Aiden
Gather Materials for prototype two	Start 10/23 Due 11/7	Gabe
Create subassembly of prototype 2	Start 11/6 Due 11/11	Gabe
Create subassembly of prototype 2	Start 11/6 Due 11/11	Aiden
Create subassembly of prototype 2	Start 11/6 Due 11/11	Sharmarke
Assemble the whole prototype	Start 11/11 Due 11/12	Gabe, Aiden, Sharmarke
Test Prototype Two	Start 11/12 Due 11/12	Gabe, Aiden, Sharmarke
Analyze Test Results	Start 11/13 Due 11/13	Gabe, Aiden, Sharmarke
Prototype 3		
Review Feedback from prototype two	Start 11/17 Due 11/17	Gabe, Aiden, Sharmarke
Create Test Plan	Start 11/11 Due 11/14	Aiden
Plan assembly of prototype three including all the parts we'll need and how we will assemble it together	Start 10/23 Due 11/16	Gabe, Aiden, Sharmarke
Gather Materials for prototype three	Start 10/23 Due 11/16	Gabe
Assemble the prototype	Start 11/16 Due 11/26	Gabe, Aiden, Sharmarke
Test Final Prototype	Start 11/27 Due 11/27	Gabe, Aiden, Sharmarke
Analyze Final Prototype	Start 11/27 Due 11/27	Gabe, Aiden, Sharmarke

Project is complete!

Conclusion:

Based off the results of the tests of prototype 3, the prototype was successful in giving us a time metric for cleaning the holes of the board. We also learned which motor we should use in our system. We also improved the 3D design, and printed out a model of the wedge to prove that it would work well in our design.