

Final Design Presentation

Zen and the Art of Glitter Deposition

SEED TEAM 16

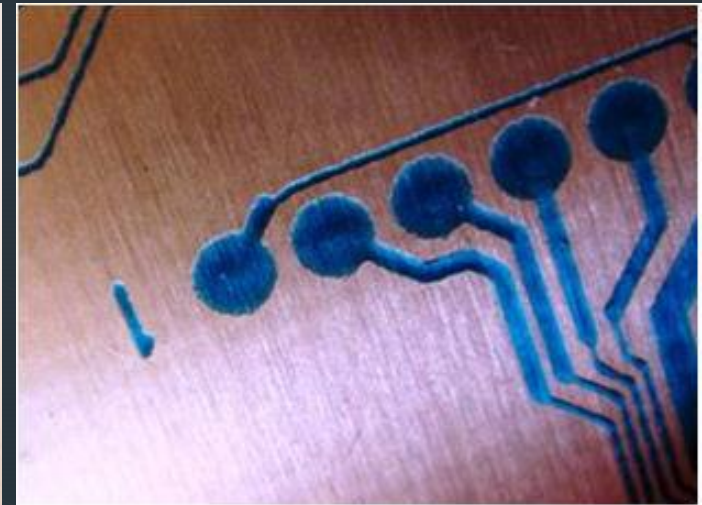
Anthony Vieriu, Emma Marston, Helen Wang, Jake Varakian



Introduction

Our Client

West Lebanon, New Hampshire



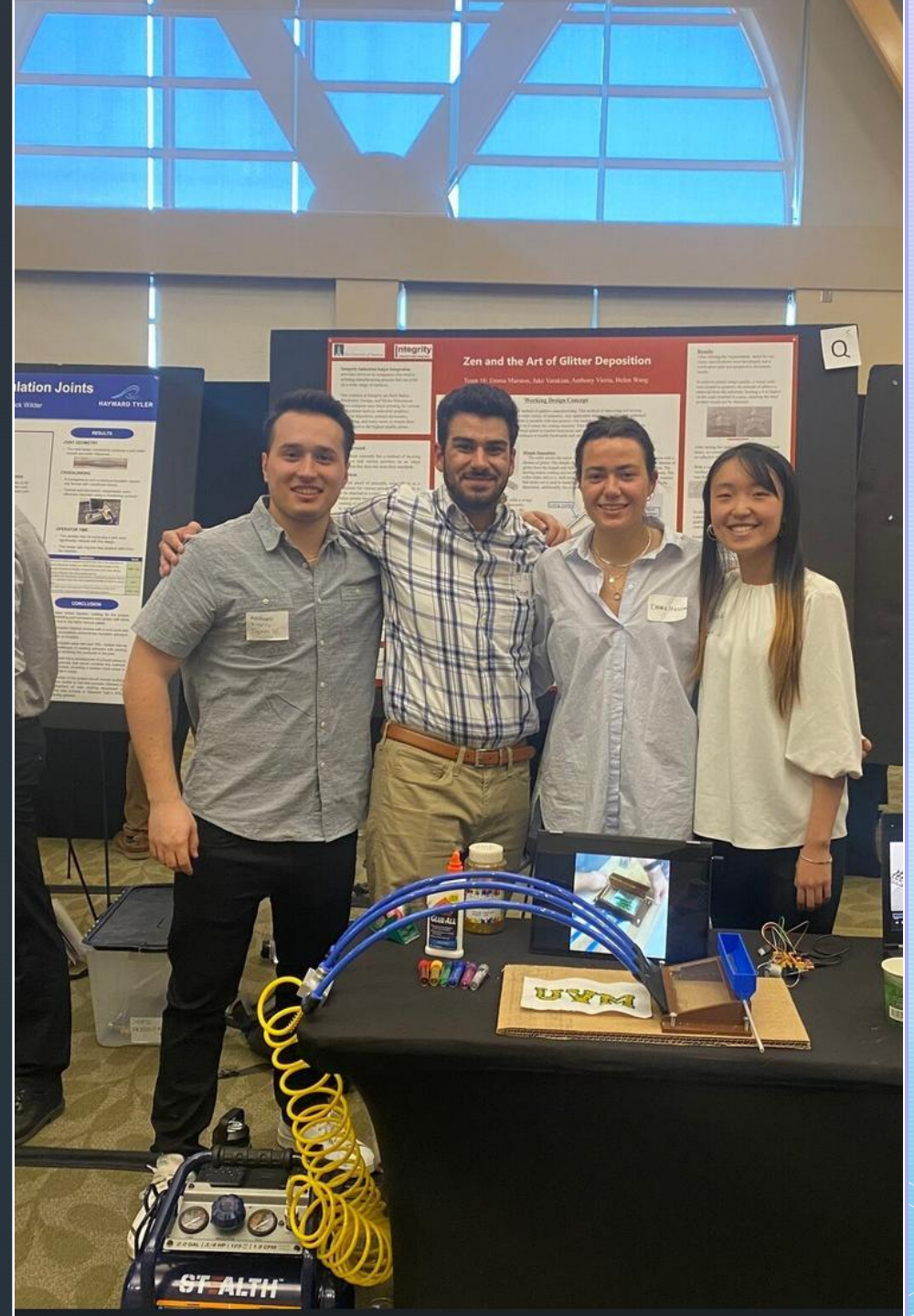
The Team

Anthony Vieriu

Jake Varakian

Emma Marston

Helen Wang

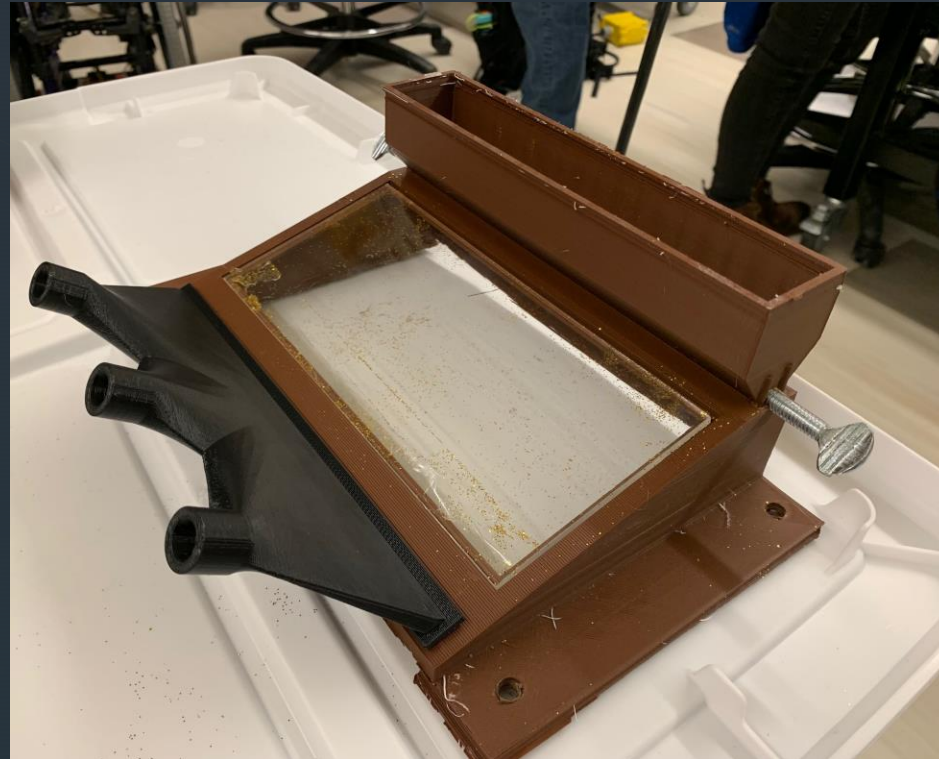




Our Mentor Dr. Marshall

Problem Statement

Develop a module to be attached to an inkjet conveyor that will dispense a uniform coating of glitter on an adhesive with a way to recover excess glitter.

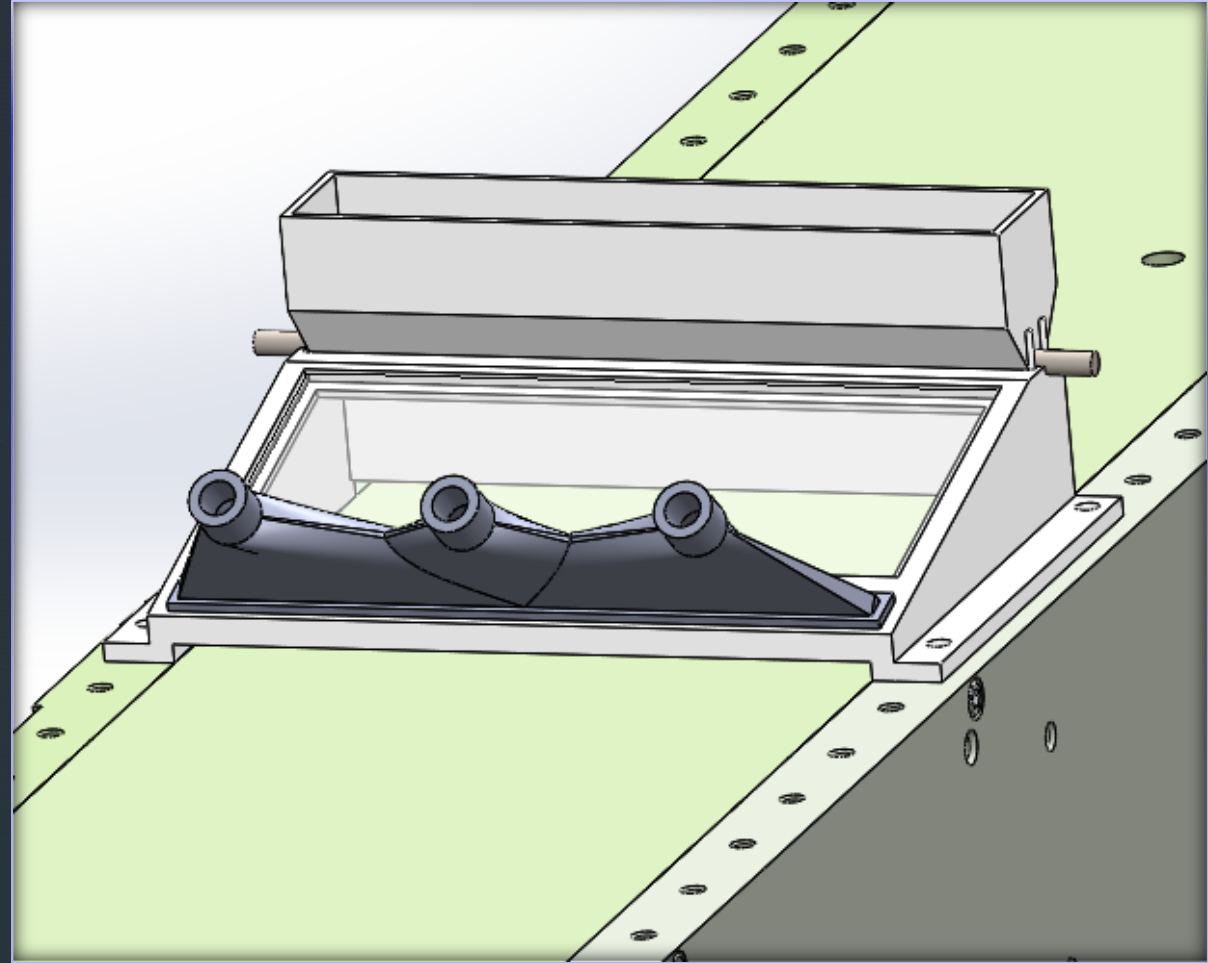
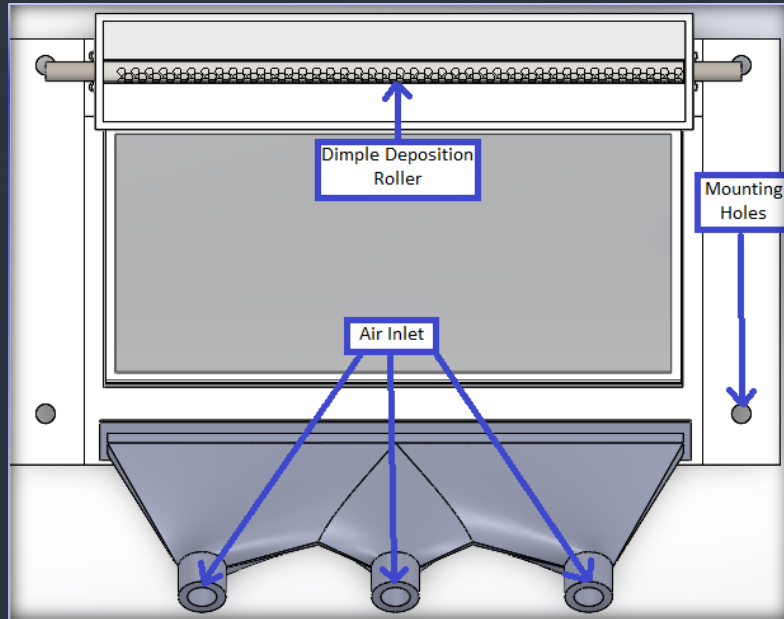
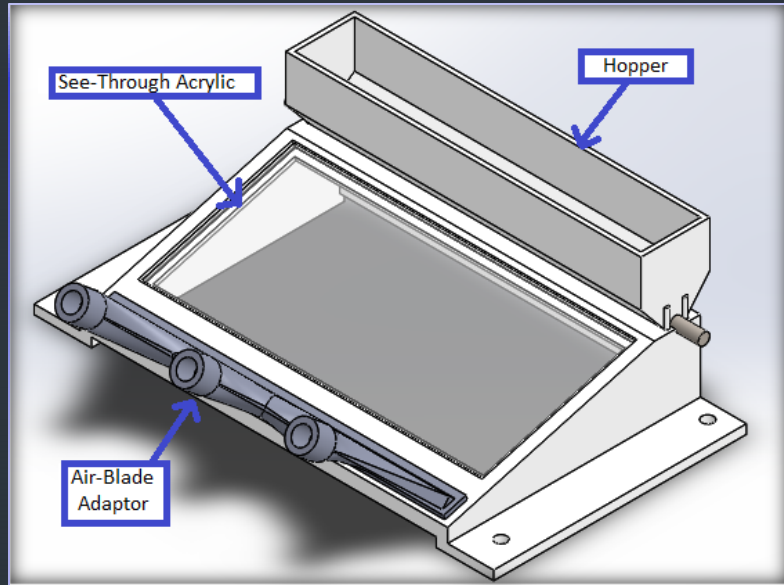


Customer Requirements

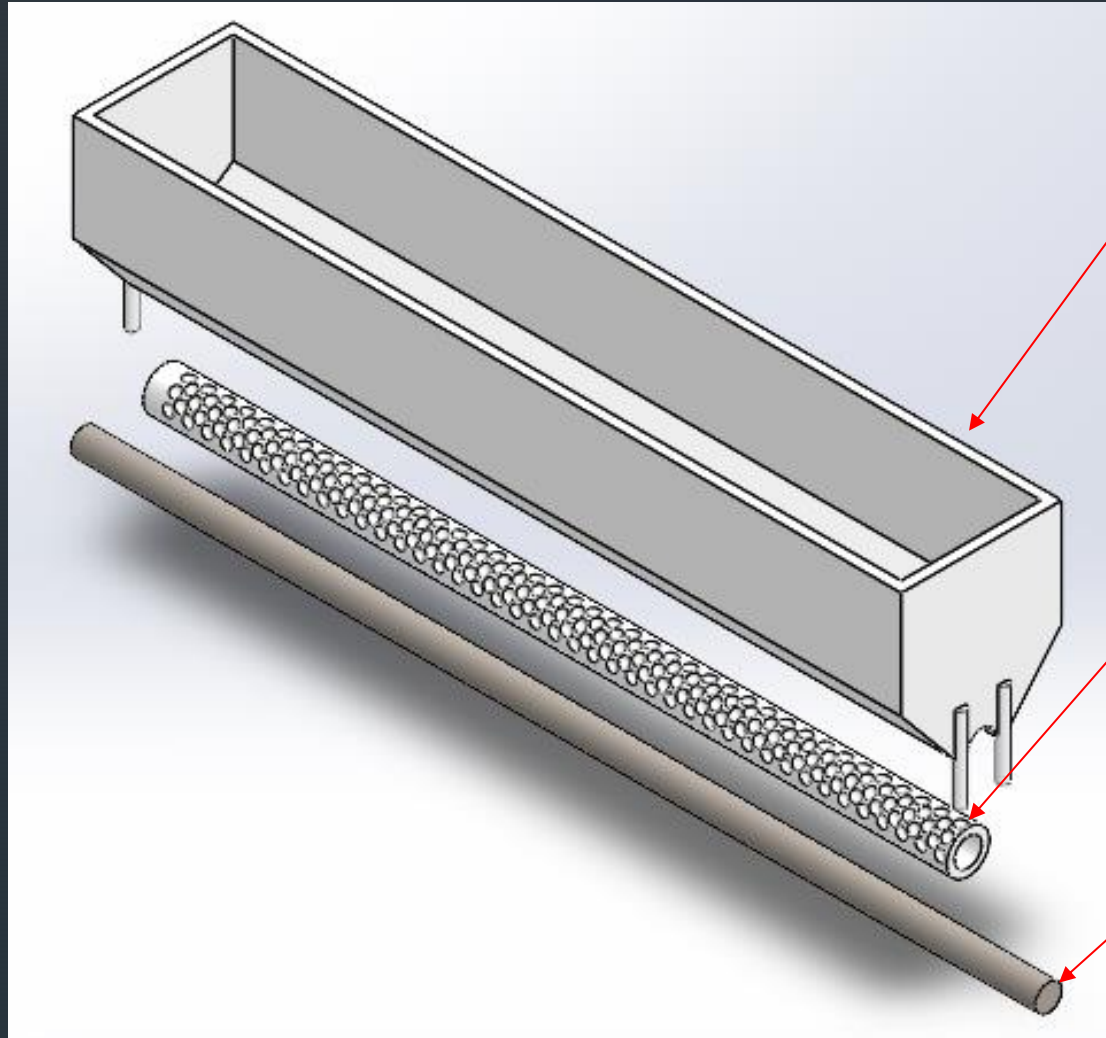
1. Clean workspace
2. Minimal waste
3. Easily controlled
4. Remove only excess glitter
5. Multiple colors
6. Fit within given parameters



Each Part Serves A Specific Function



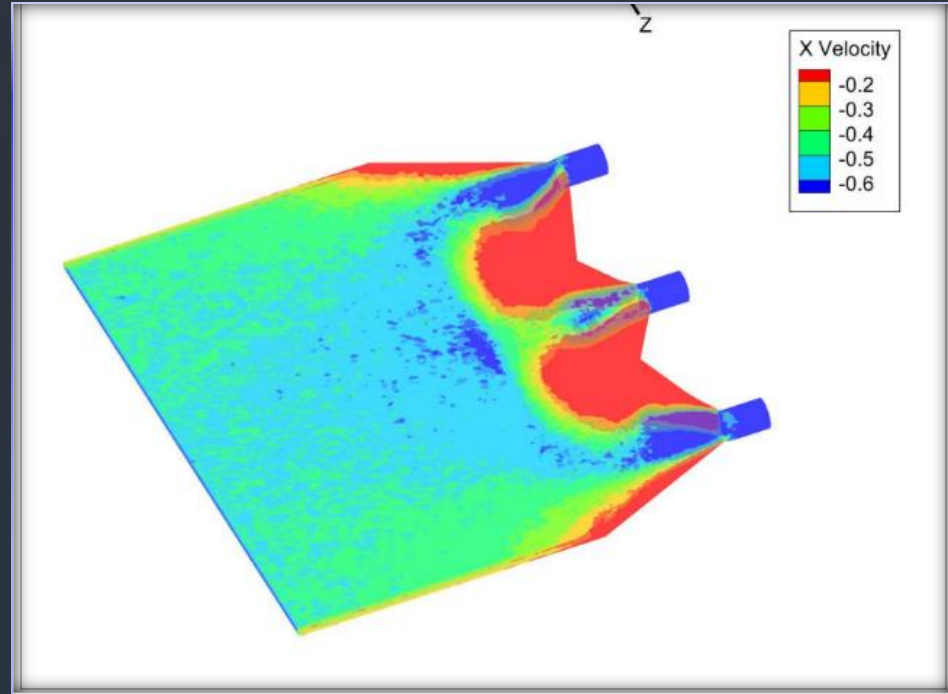
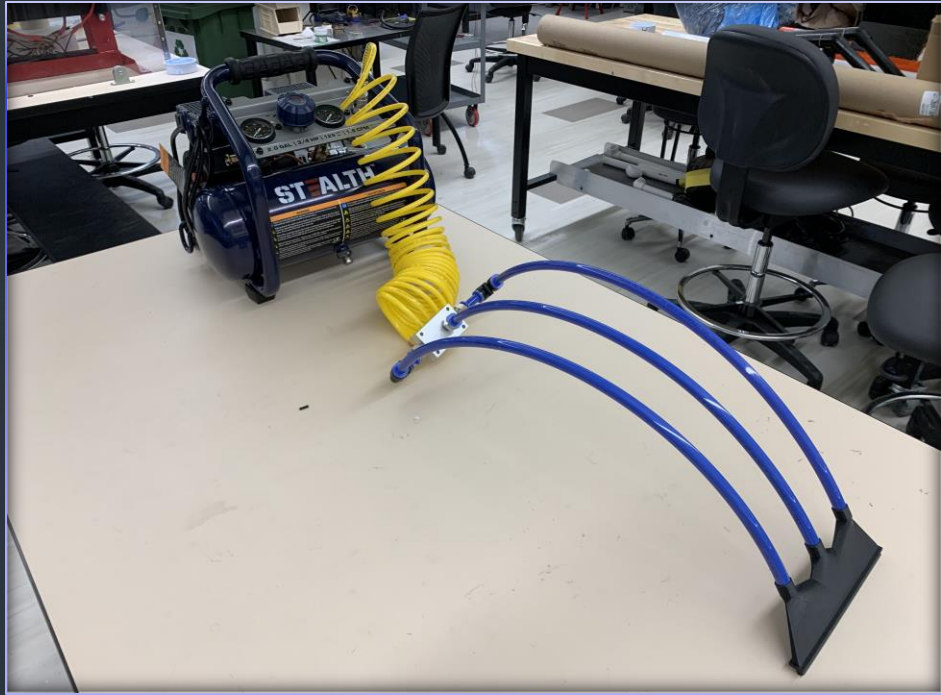
Easily Controllable Deposition



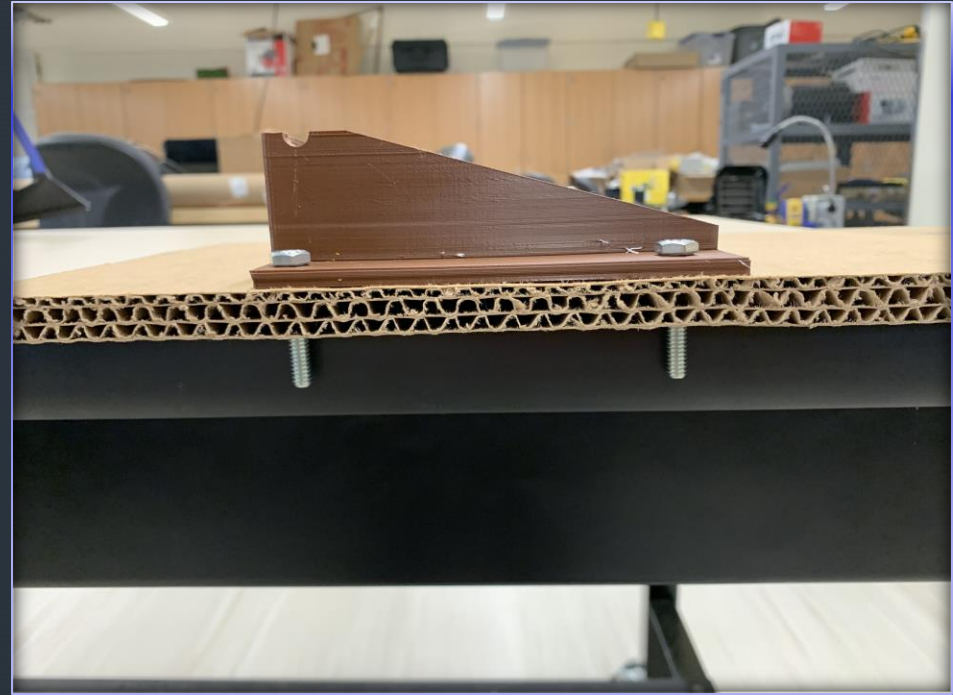
Multiple to coatings prepared at once

Dusting not clumps

Rotation easily controlled



Creating an Air blade From a Compressor

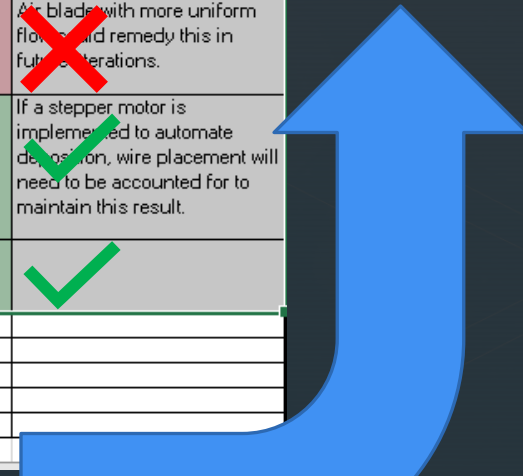


Client Compatibility and Useability

Organizing the Solution to the Problem

Engineering Specifications					Results			
ID	Relative Weight	Engineering Specification	Units	Notes	Verification Method	Verification Result	Verification Status (Pass/Fail/Not Verified)	Notes
10	13%	The hopper shall deposit 1 tsp +/- 1/6 tsp of glitter per coating to prevent material waste	teaspoon (tsp)		Demonstration	One turn of the roller deposits < 1 tsp of glitter	Pass	✓
20	14%	The quantity of adhesive removed from the substrate shall not be below a 4 on the designated adhesive visual scale	Adhesive Visual scale (0-5)		Test	No adhesive was removed from the chamber and the image remained undistorted. The test scored a 5 on	Pass	✓
30	8%	Box shall be compatible with 1/4 20 inch mounting threaded holes on Integrity's conveyor system	inch (in)			Current design is compatible with 1/4 20 inch	Pass	✓
40	9%	Glitter coating process shall be halttable within 3 seconds after command is initiated	seconds (s)		Demonstration	After turning off the air source, glitter mixing halts almost immediately and takes < 3	Pass	✓
50	14%	Box shall be able to continuously displace glitter for 1 minute	minute (min)		Test	Box ran continuously, displacing glitter for over a minute	Pass	✓
60	4%	The chamber length shall be less than 7 inches	inch (in)		Demonstration	Design is 5.5 inches long	Pass	✓
70	8%	The box shall have at least 1 side that can be seen through to visualize glitter flow/adhesion	wall		Demonstration	1 clear acrylic sheet is present to visualize mixing from a	Pass	✓
80	14%	The quantity of escaped glitter shall not exceed a 2 on the designated glitter escape visual scale.	Glitter escape visual scale (0-5)			Current design scores 4 on average on the scale.	Fail	✗ Air blades with more uniform flow and remedy this in future iterations.
90	9%	Shall not have any contact between any pieces of metal or electrical wires that can create heat, sparks, or shavings.	Contact Points		Demonstration	There are currently no contact points between metal and no wires present inside of	Pass	✓ If a stepper motor is implemented to automate deposition, wire placement will need to be accounted for to maintain this result.
100	8%	The quantity of adhered glitter coating the substrate shall not be below a 4 on the designated glitter coating visual scale.	Glitter coating Visual Scale			The current design scored a 4 on the scale	Pass	✓
110								
120								
130								
140								
150								
Total	100%					Relative Pass	86%	

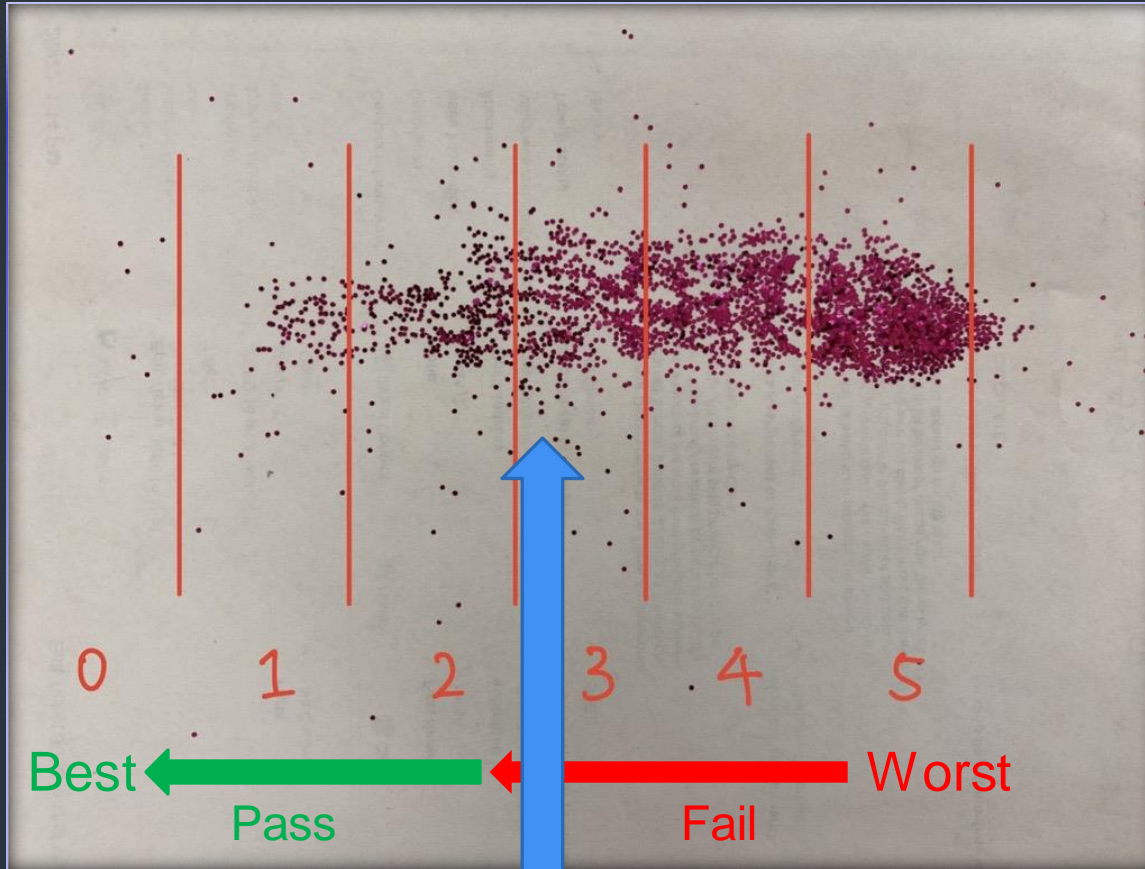
Relative
Pass:
86%



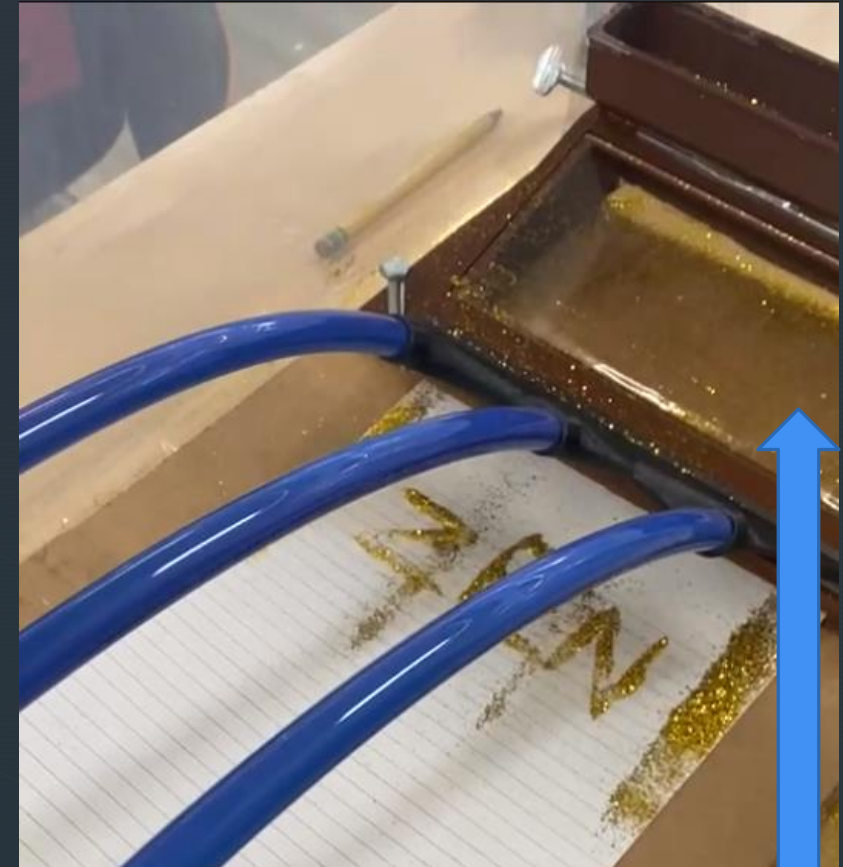


Focusing On What's Most Important

Containing The Particles: ID 80



Testing Average:
Fail



Glitter Escape Rate:
3 on scale

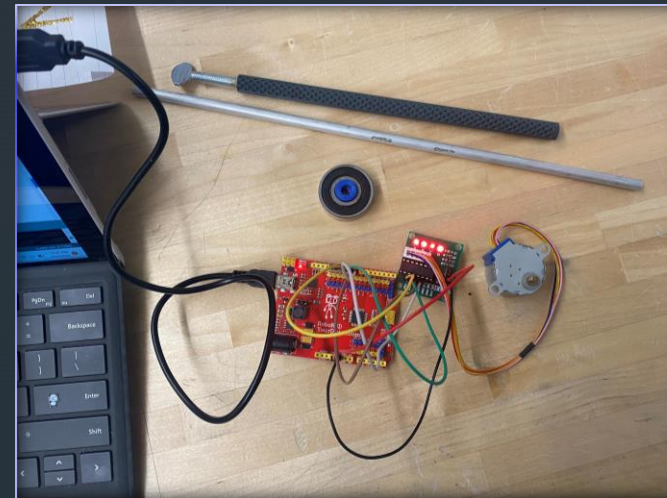
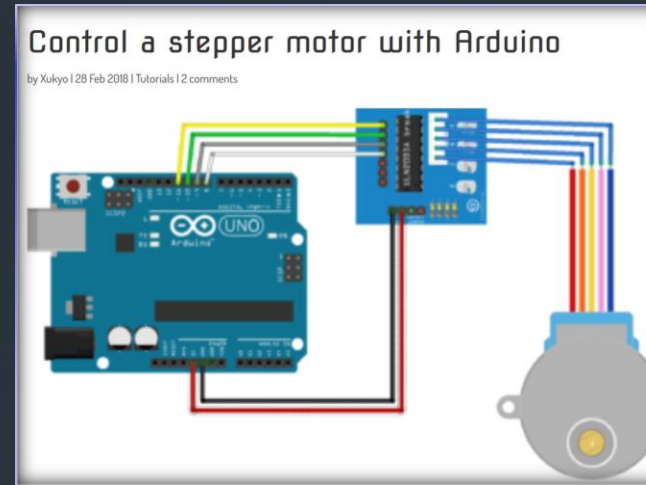
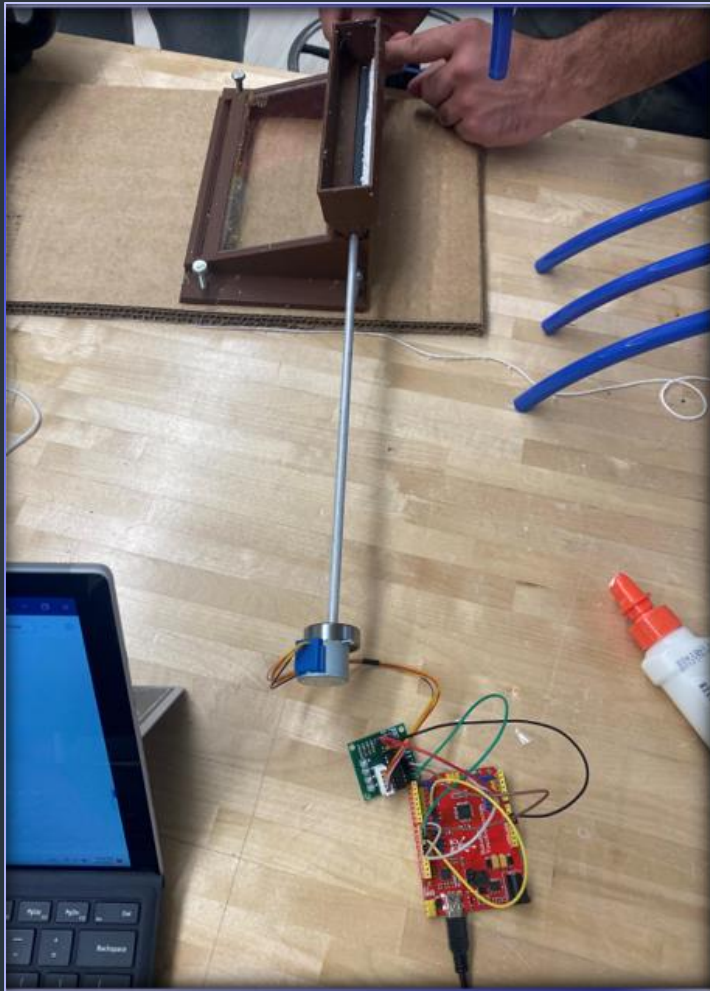
➤ Nonstop Printing Process: ID 50



One Minute
Plus Easily

Printing Back-To-Back

Open issues (continuing development)





Total Spent	\$789.56
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Total Budget	\$2,500.00
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Total Leftover	\$1,710.44
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Successes and Failures



Implementing Feedback Into Design Iteration

Sprint 6 Testing

Feedback from Sprint 5

- Aquarium tubing that releases bubbles (can precisely speed up or down the air with valves)
- Consider flute (manifold tube with multiple ports)
- Can also pinch the tubes and control the pressure



Client Satisfaction

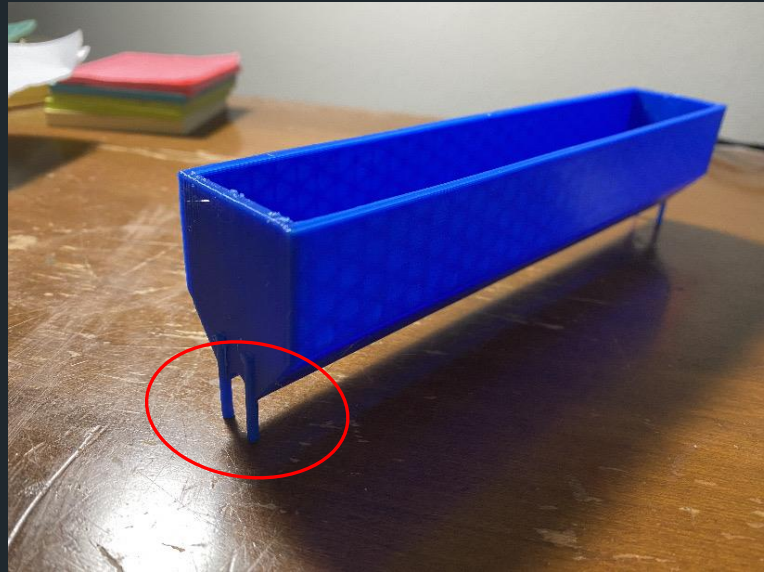
“Right on track with expectations. Making good progress going into the last leg of the course. Narrowed several ideas down to a single more viable one.” – Sprint 6 Review

*“The group has produced multiple designs over the course of the program, and we are happy to see them recognizing issues with past iterations and improving on them”
– Sprint 4 Review*

Sprint	Score	
	“The latest increment meets my expectations”	“I am satisfied with the overall progress of increments throughout the SEED program so far”
1	4	4
2	4	4
3	4	4
4	4	4
5	4	4
6	4	4
7	4	4

Lessons Learned

1. prototyping tolerance issues

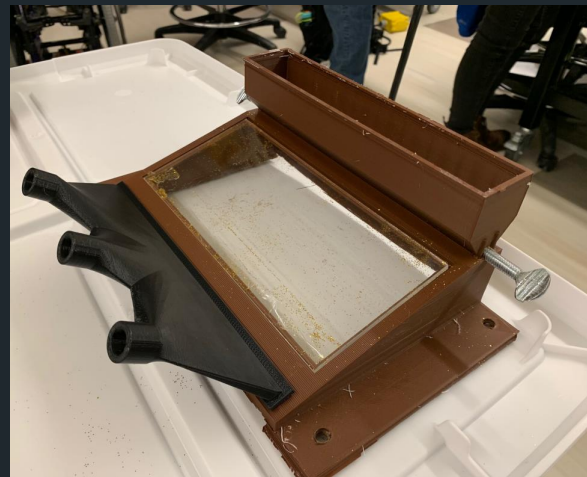


Lessons Learned

2. communication between teammates and clients



First Design



Final Design

Thank You