TEAM

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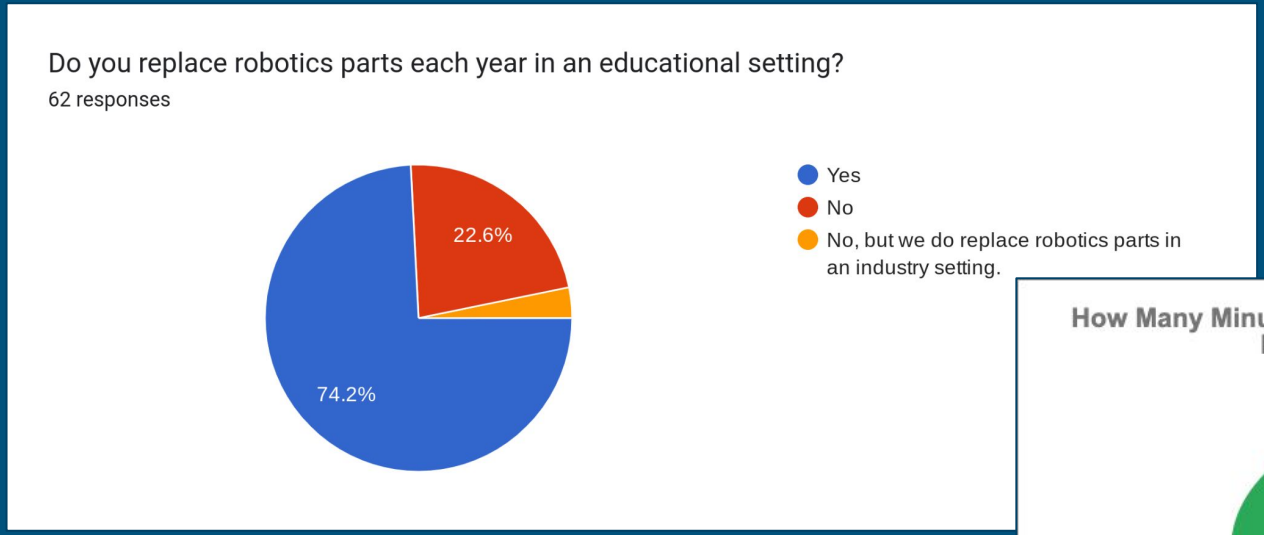
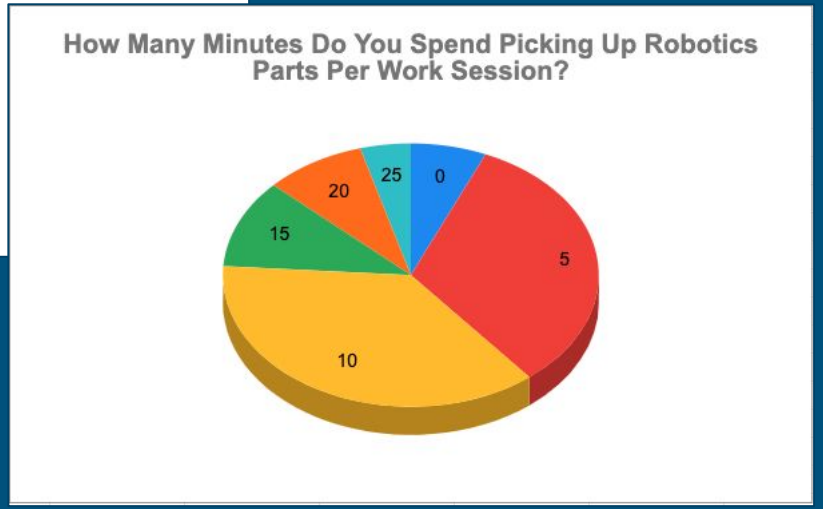
Problem Statement

A survey of educators that use robotics equipment reported spending an average of $350 during the 2022-2023 school year due to parts being lost during project time. Some of this replacement cost is due to parts falling on the floor and becoming lost. Educators do not have enough time to confirm all parts have been acquired.

Market Research



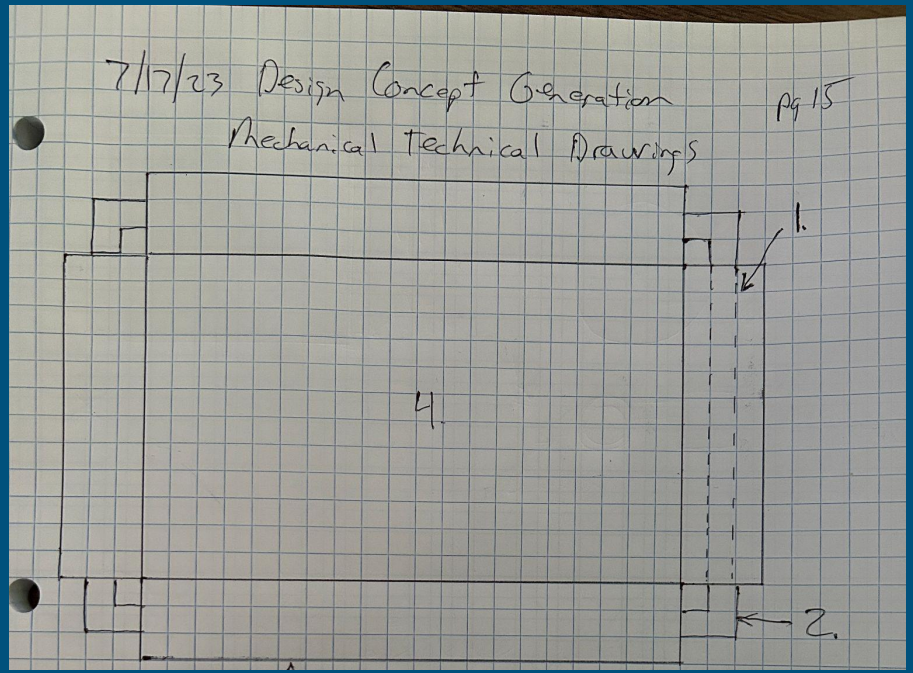


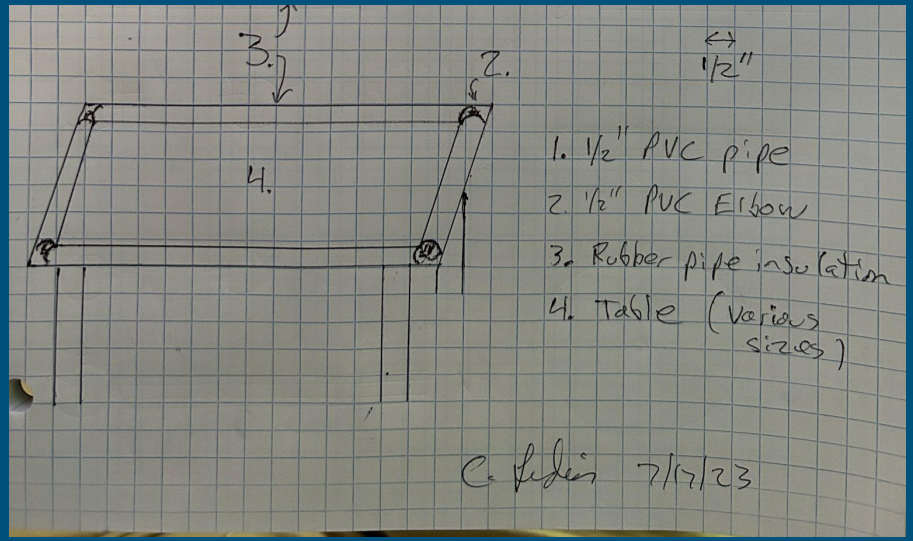
Present Solutions

Design Requirements (Constraints)

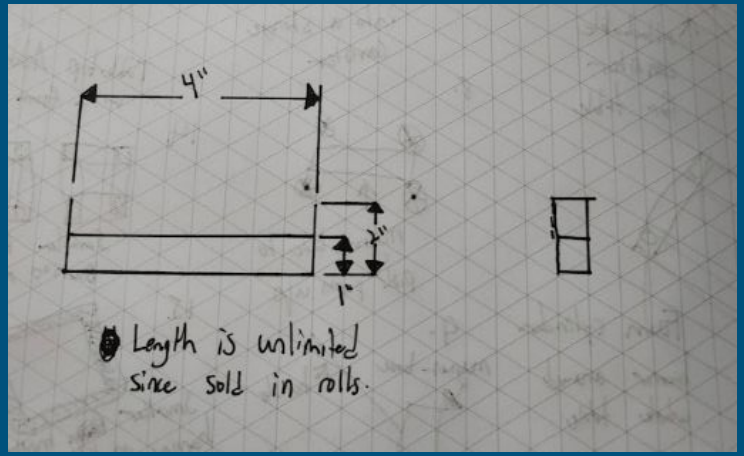
1. Mechanical only
2. Quiet operation
3. Able to collect large items
4. Efficient/Quick Operation
5. Collection bin is easily emptied
6. Lightweight
7. Prevents objects from falling off table

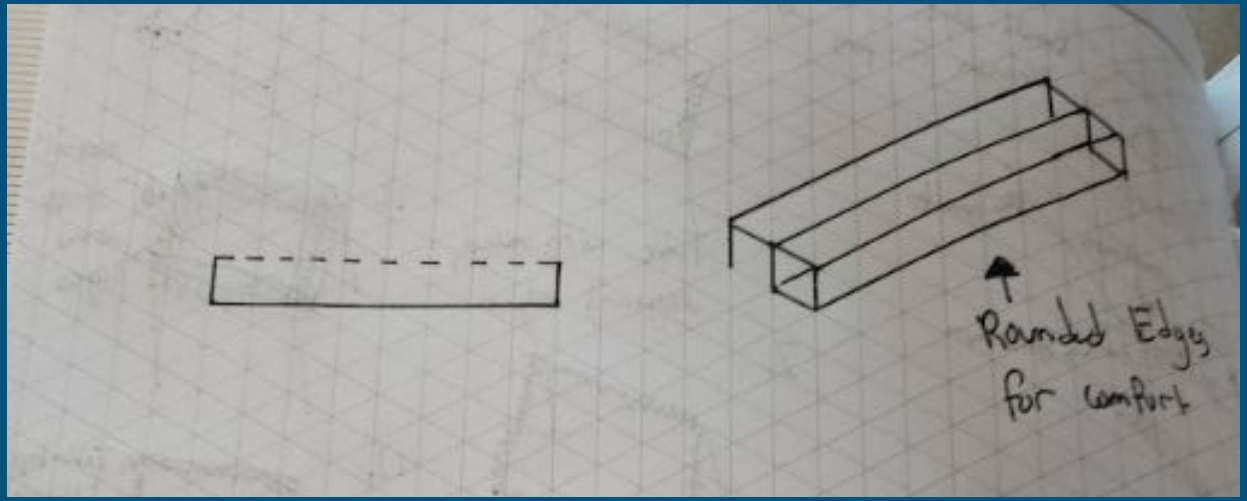
Potential Solution #1



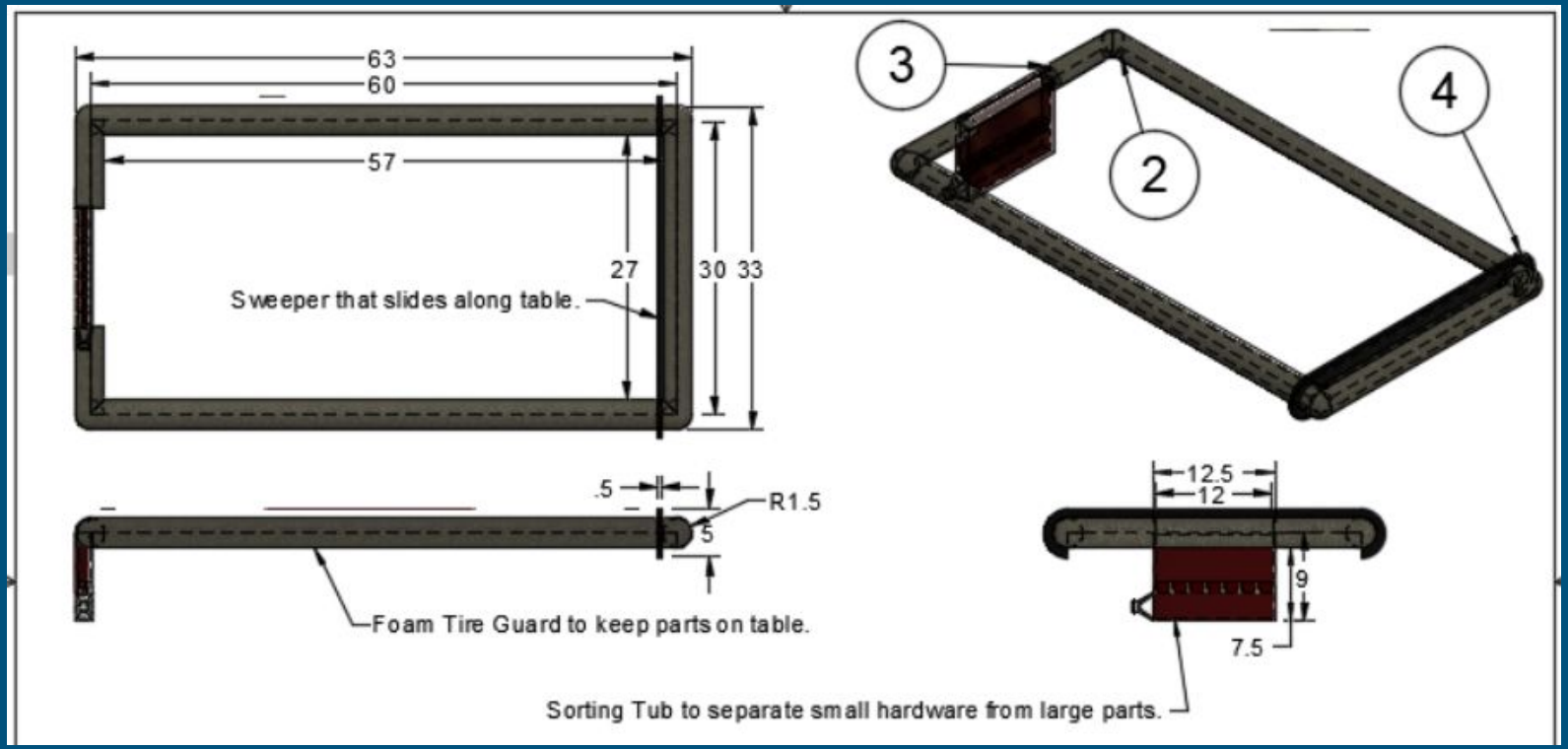


Potential Solution #2

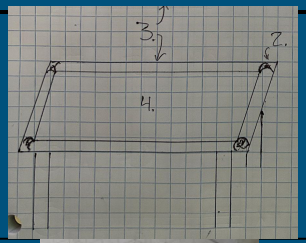
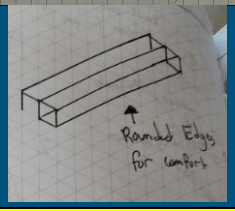




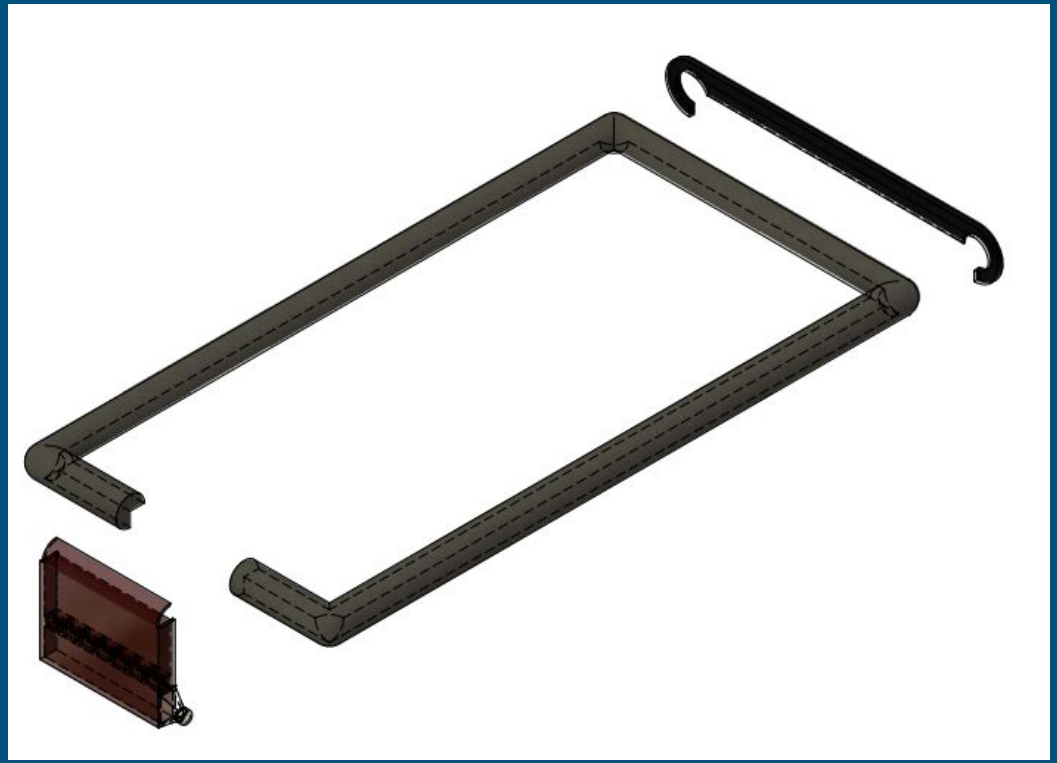
Potential Solution #3



Decision Matrix

	Mechanical only	Quiet operation	Able to collect large items	Efficient/Quick Operation	Collection bin is easily emptied	Lightweight	Hand held	Long handle/ Upright Design	Autonomous	Cost	Prevents objects from falling off table	Total
	5	5	1	3	1	4	5	4	1	3	5	37
	5	5	1	3	1	5	1	1	1	4	4	31
	5	5	3	4	4	3	5	4	1	5	5	44

Chosen Solution



https://www.youtube.com/watch?v=nqtecW_vDuY

Bin for sorting VEX robotics parts - YouTube

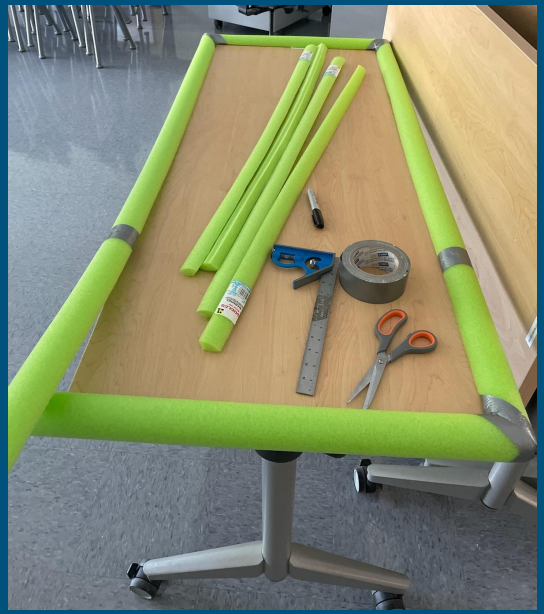
Prototype Build

Bill of Materials

Product Description	Picture	Supplier	Quantity	Price Each	Total Price
Pool Noodle		Dollar General	4	$1.08	$4.32
Foam Board		Amazon	1	$9.80	$9.80
Duct Tape		Amazon	1	$6.99	$6.99
3D Printer Filament		MatterHackers	1	$20.87	$20.87
Velcro Strips		Amazon	1	16.98	16.98
				Total Cost	$58.96

Total Cost	$58.96

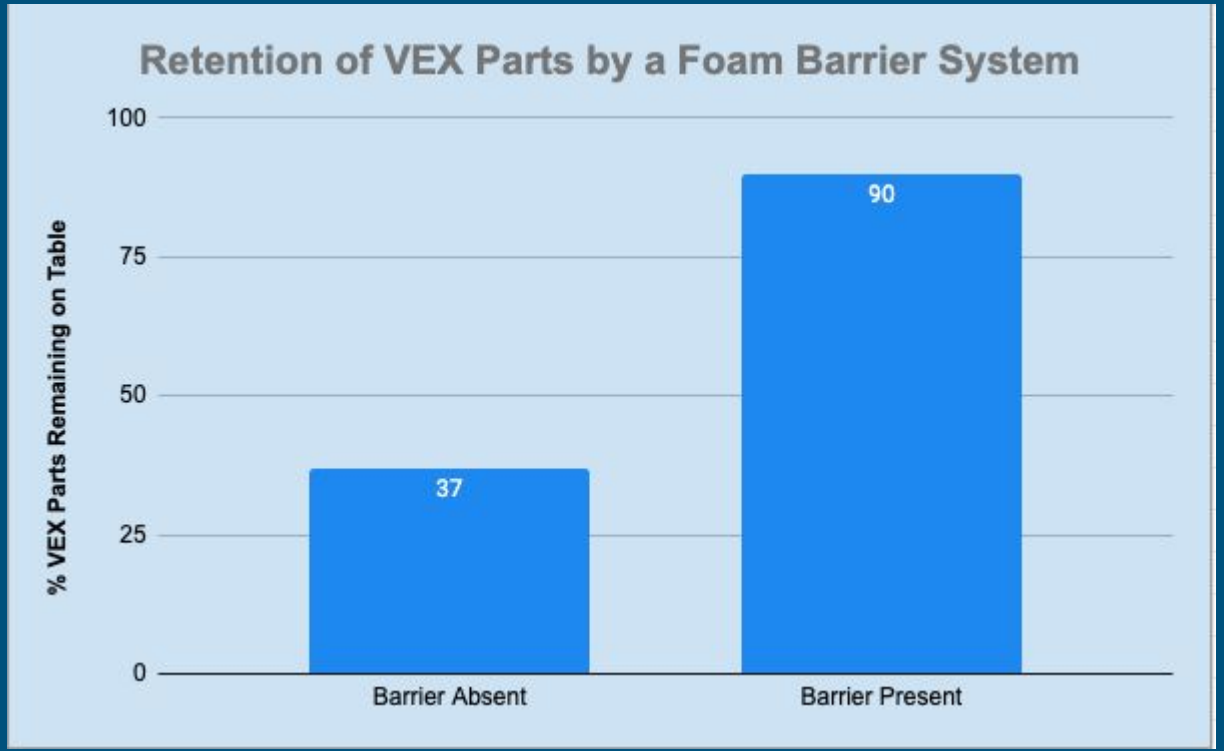
-Barrier-



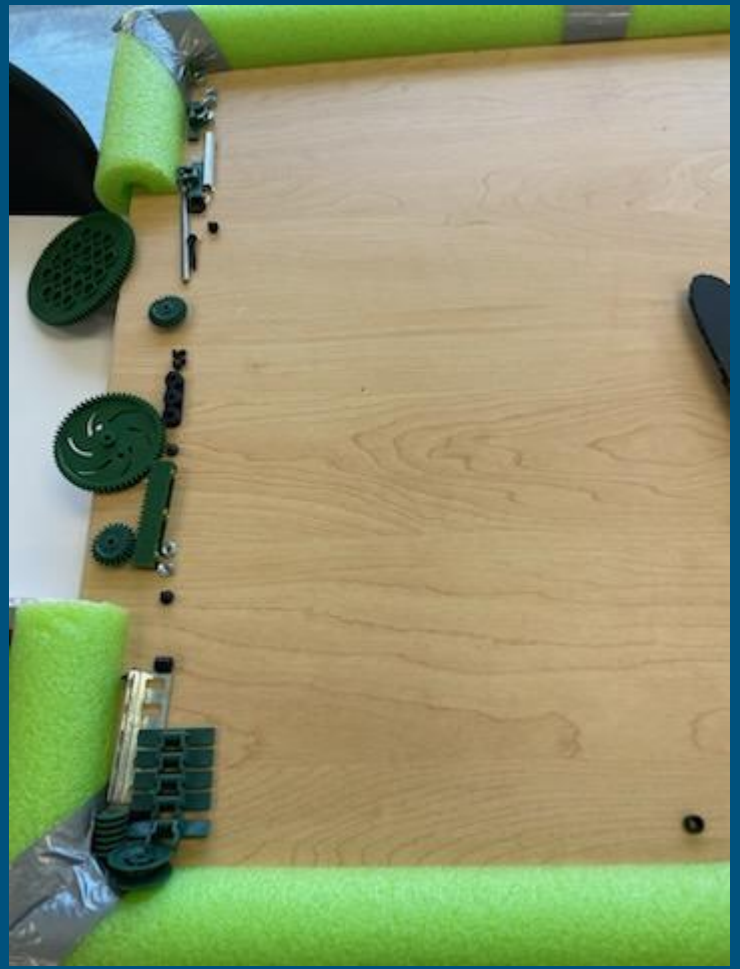
Bin-

Broom-

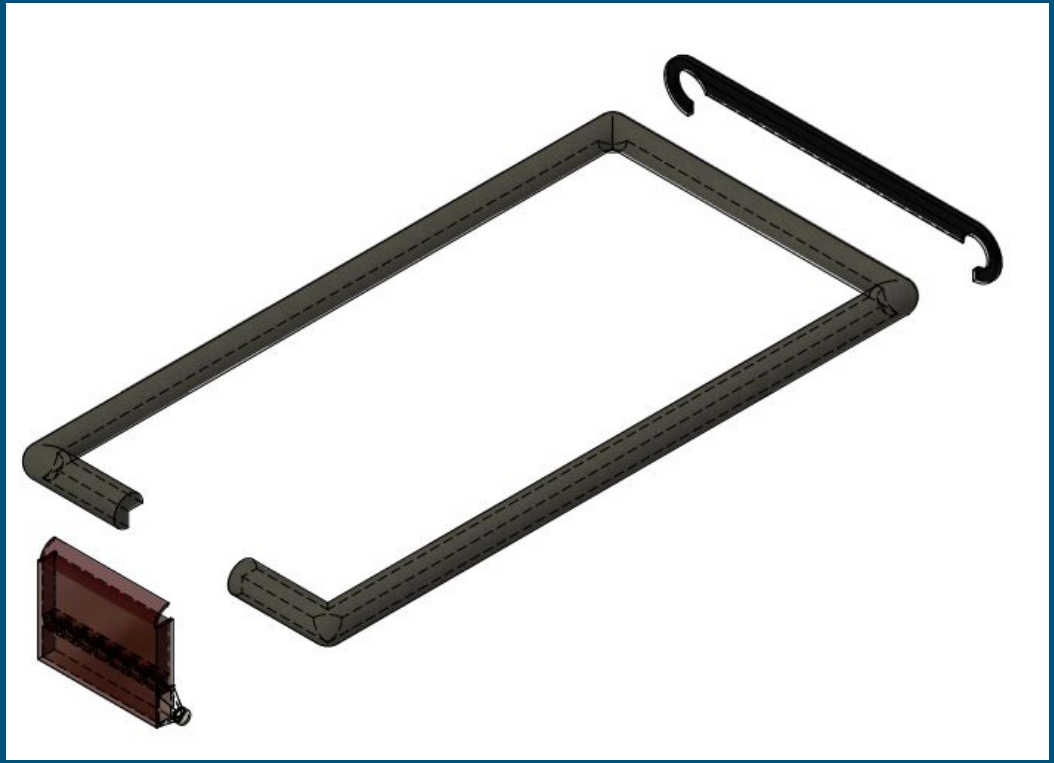
Testing


Retention of VEX Parts by a Foam Barrier System
% VEX Parts Remaining on Table
100
75
50
25
0
37
90
Barrier Absent
Barrier Present

What's Next?



Questions?

Your Best Solution:

Barrier - Broom - Bin