

terralock

Ben, Berzelai, Max, Noah, and Liam



Our Motivation



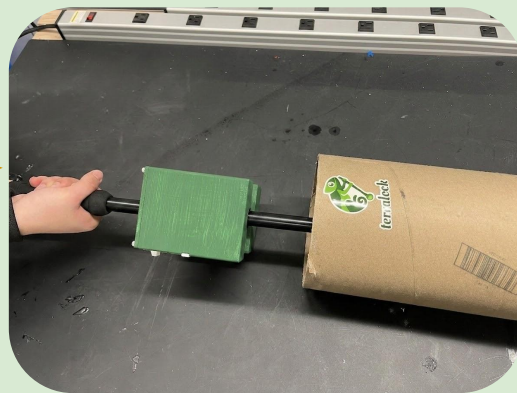




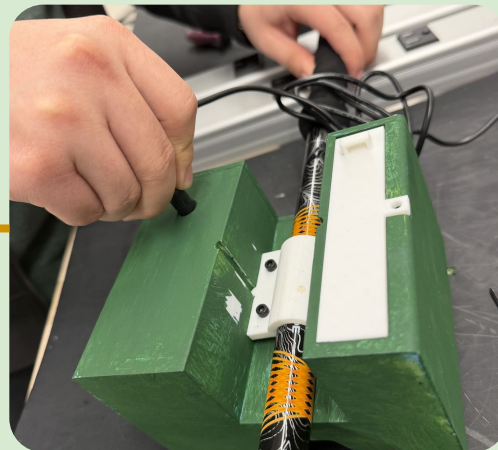
1.



2.



3.

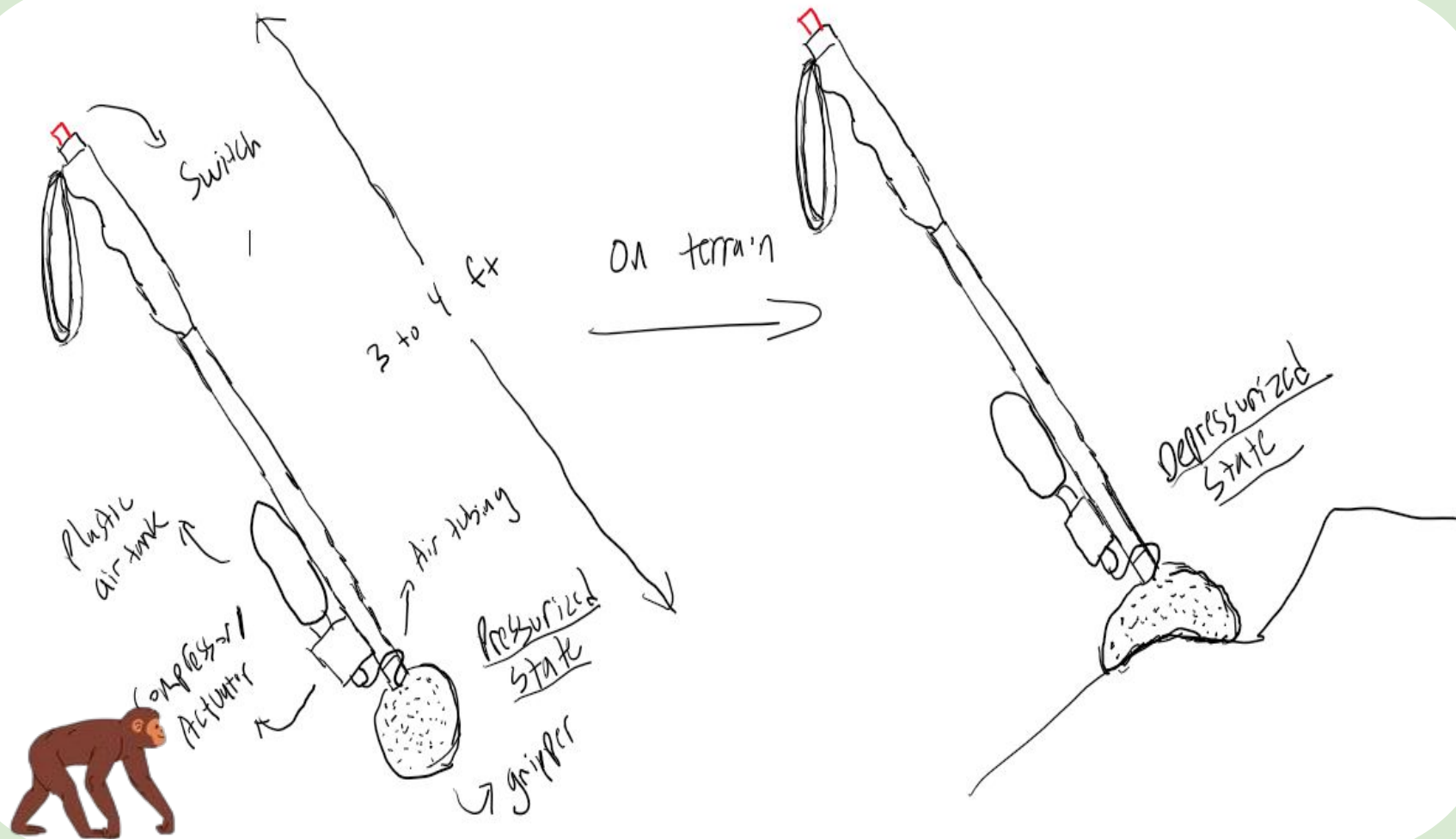


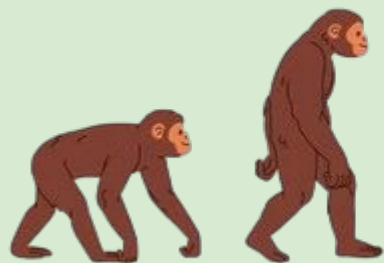
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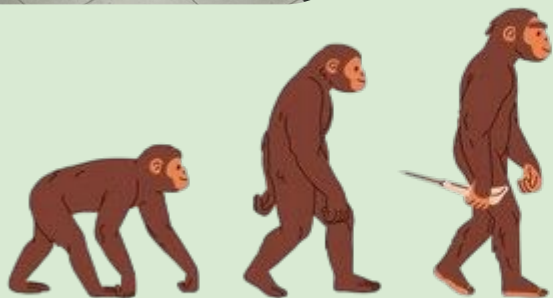


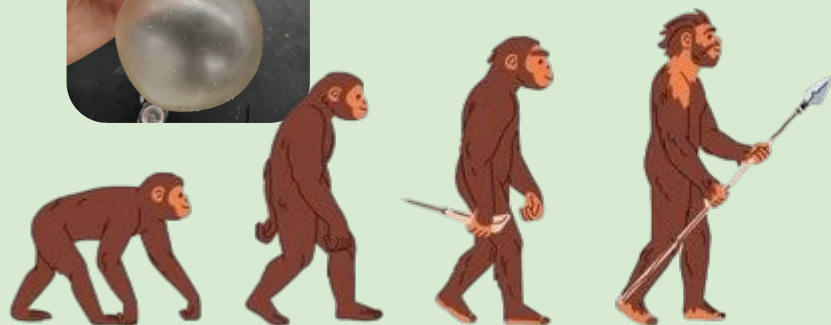
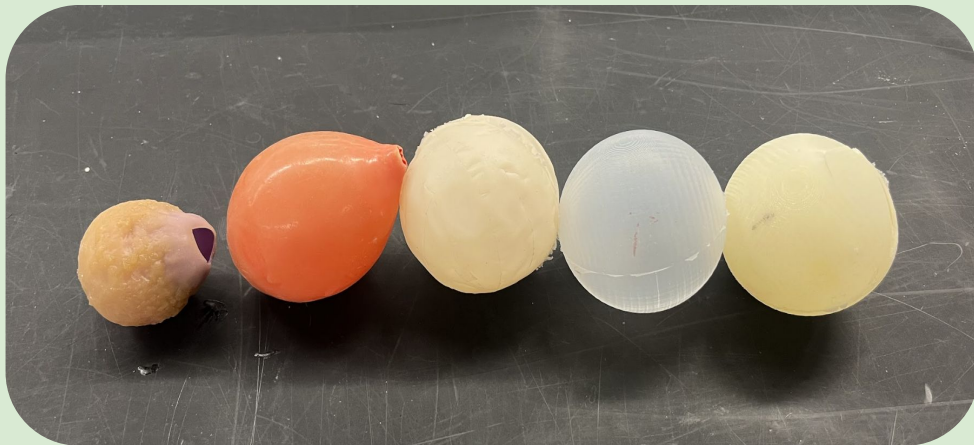
Our Journey

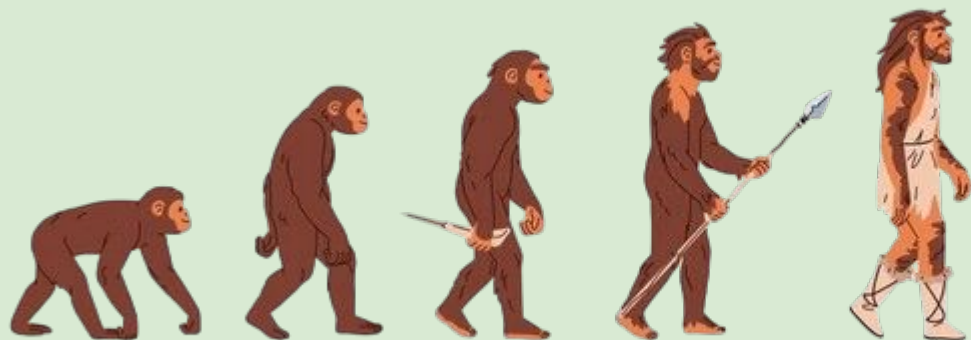
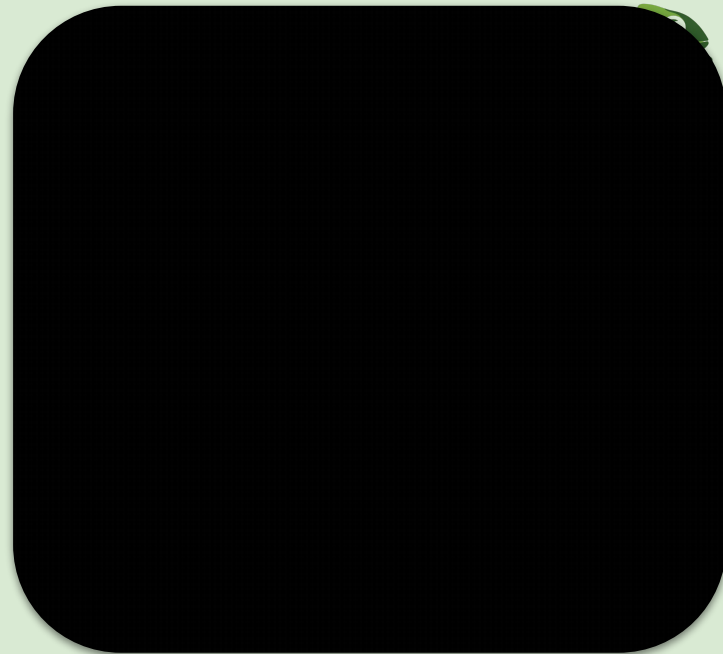
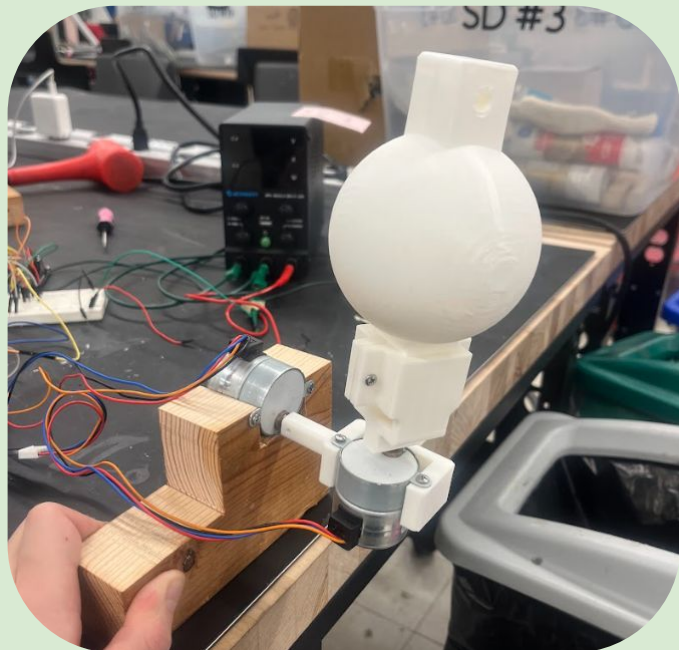


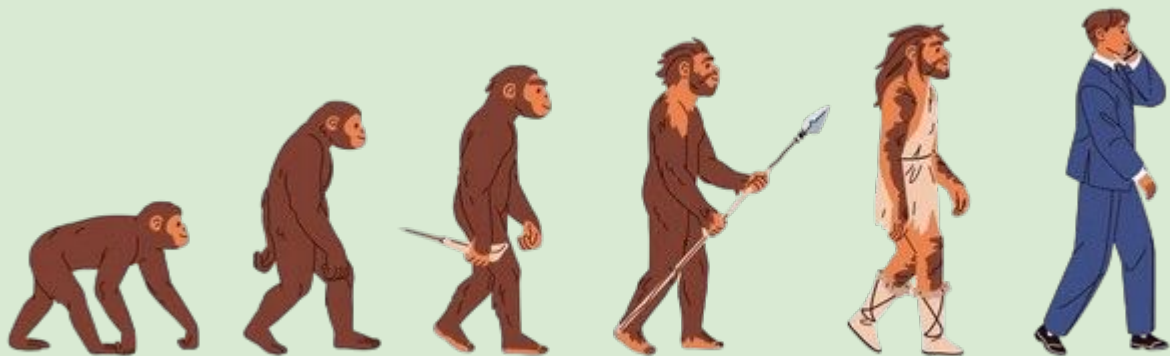
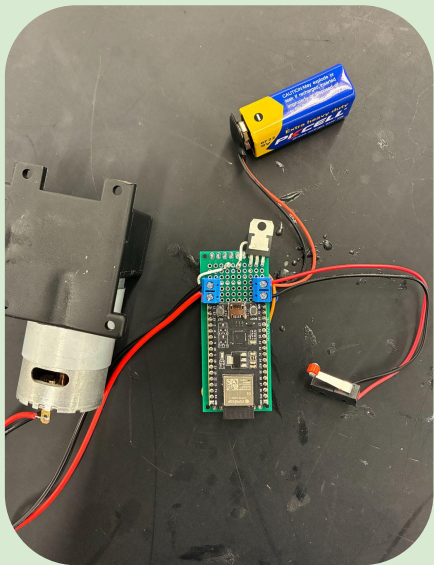


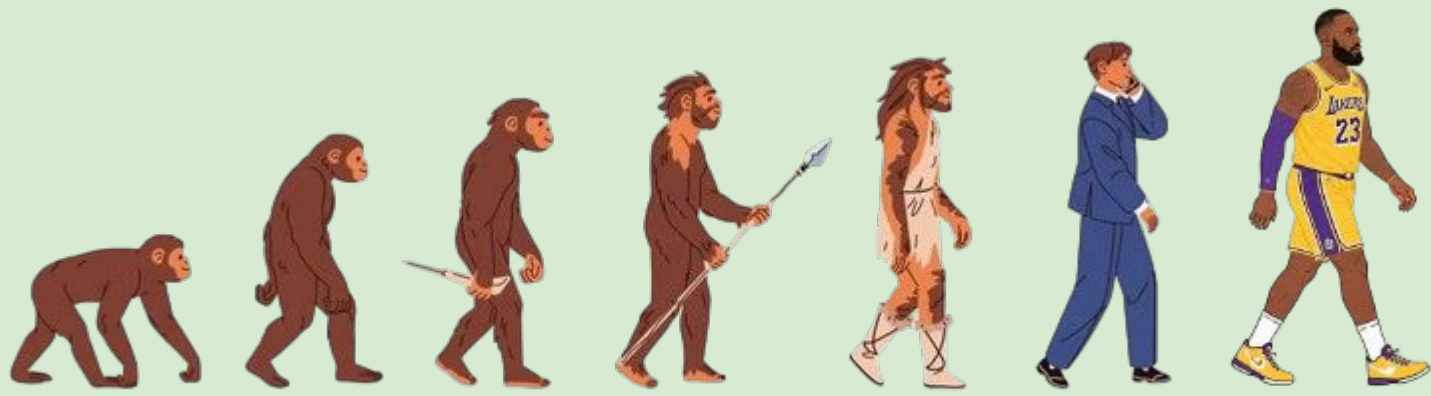
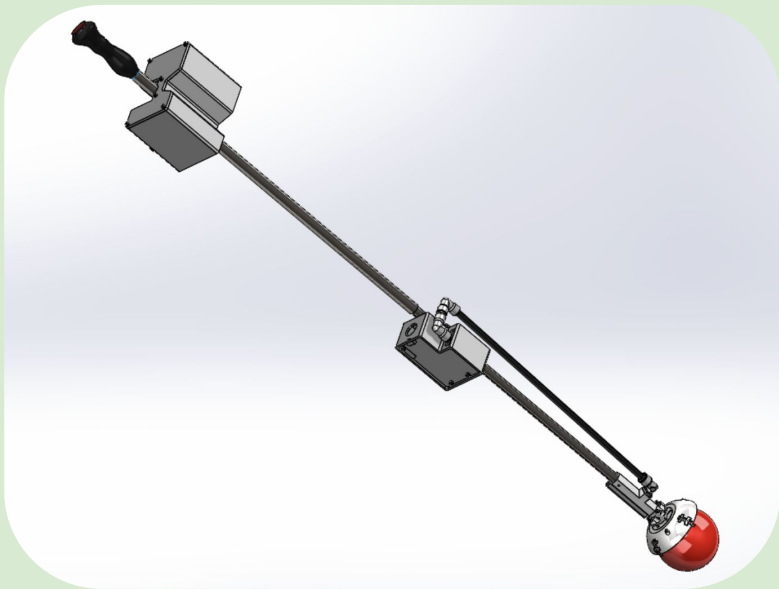


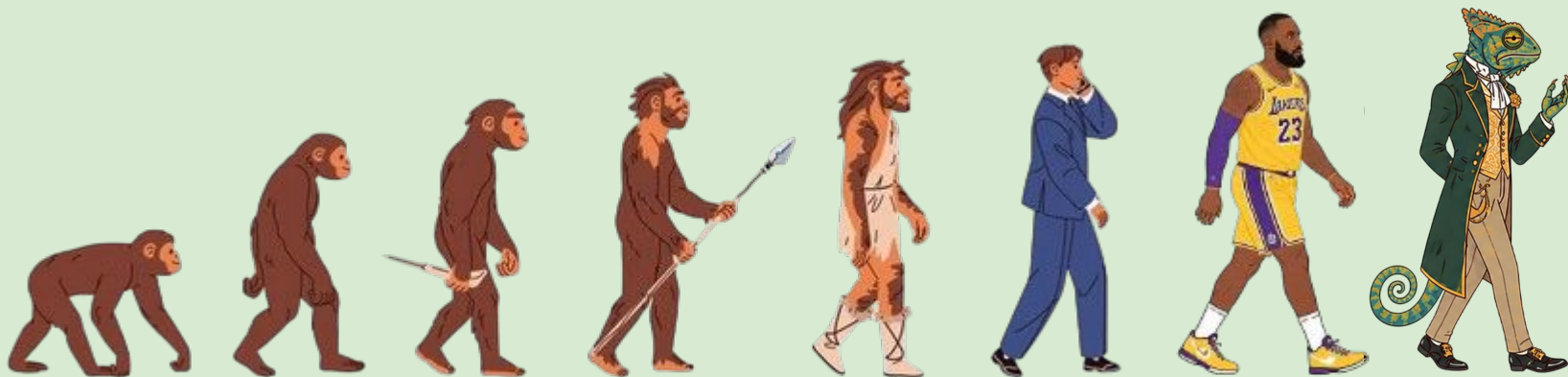
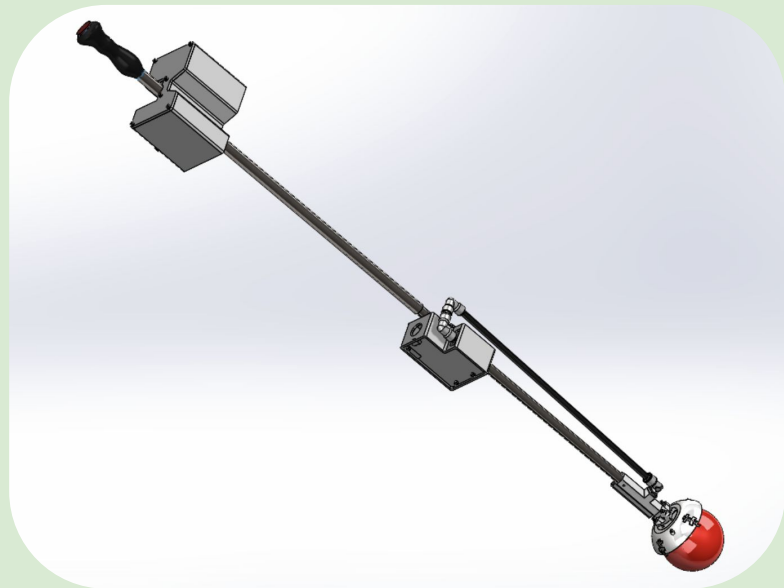




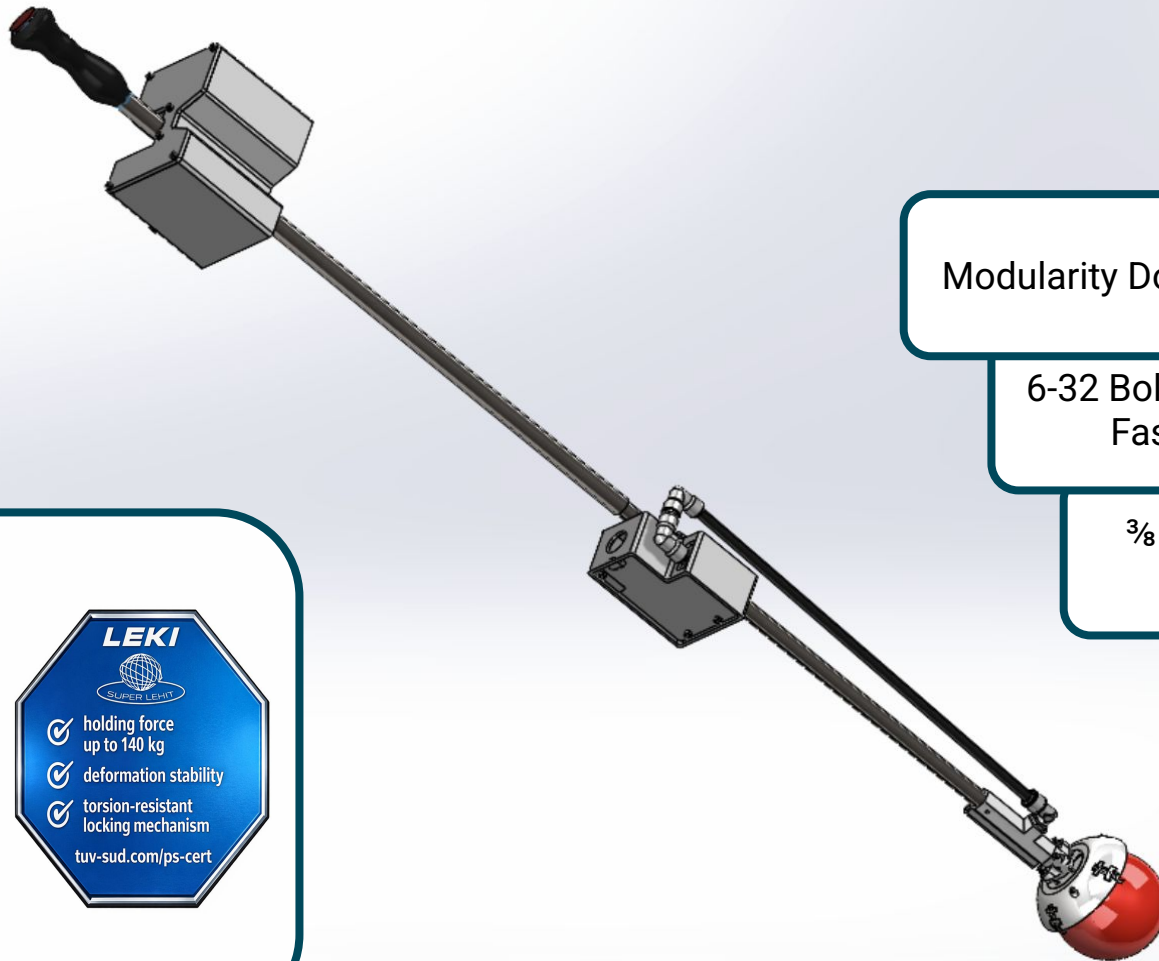












Modularity Doctrine

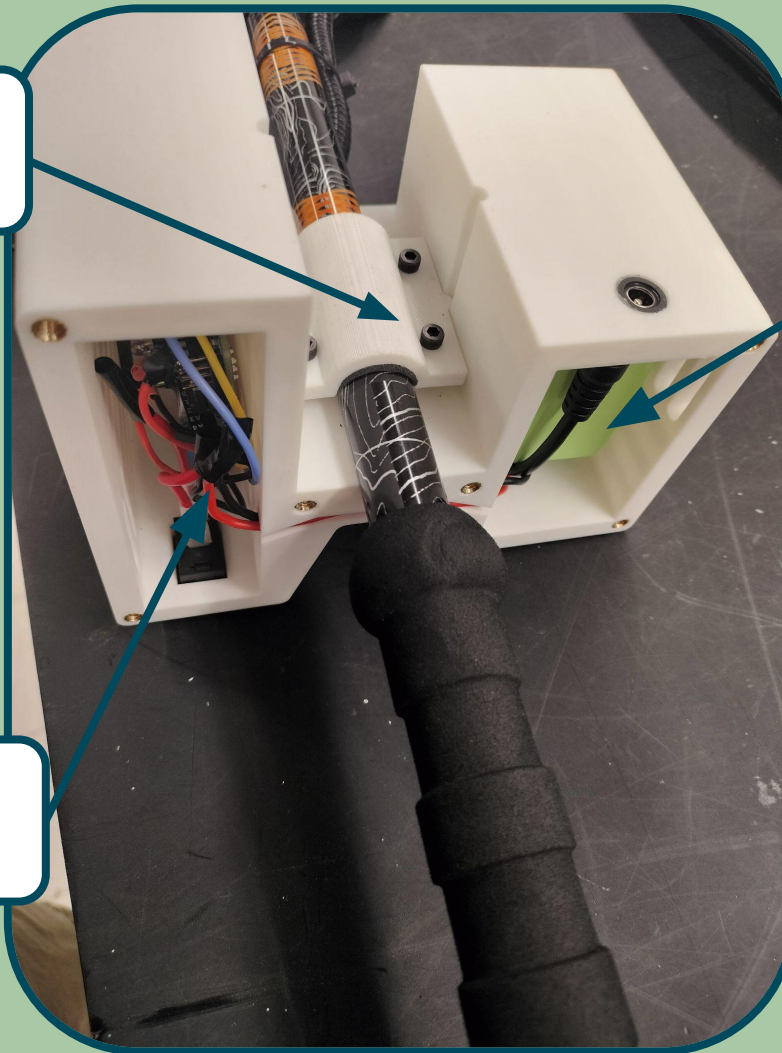
6-32 Bolt & Heat Set
Fasteners

$\frac{3}{8}$ NPT Fittings &
Piping



Pole Clamp

Electronics



IEC 62133 - Battery
Safety Standards

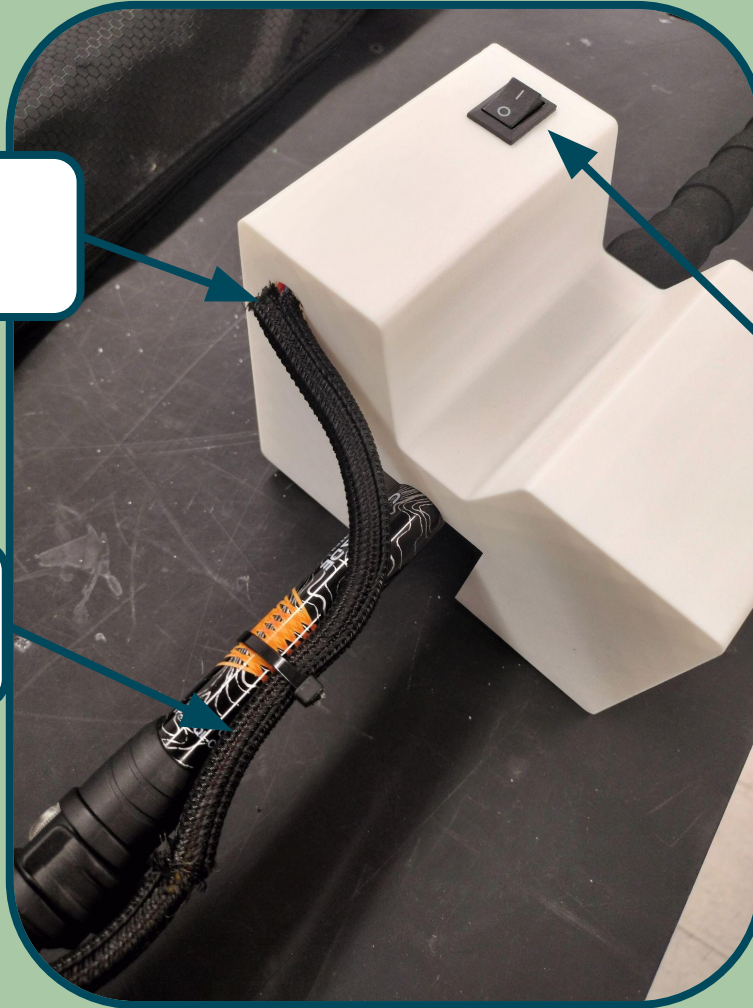
NEC 725 Low
Voltage Wire
Standards

Electronics Housing

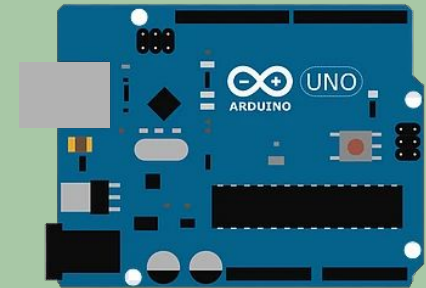
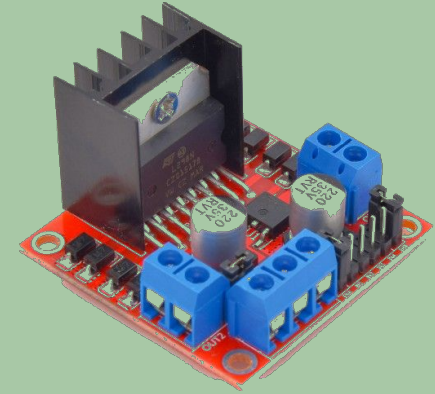
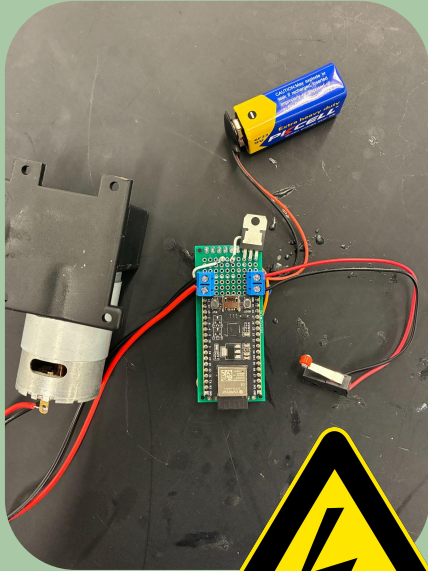
Wire Port

Power Switch

Mesh Wire Sleeves



Updated Electronics

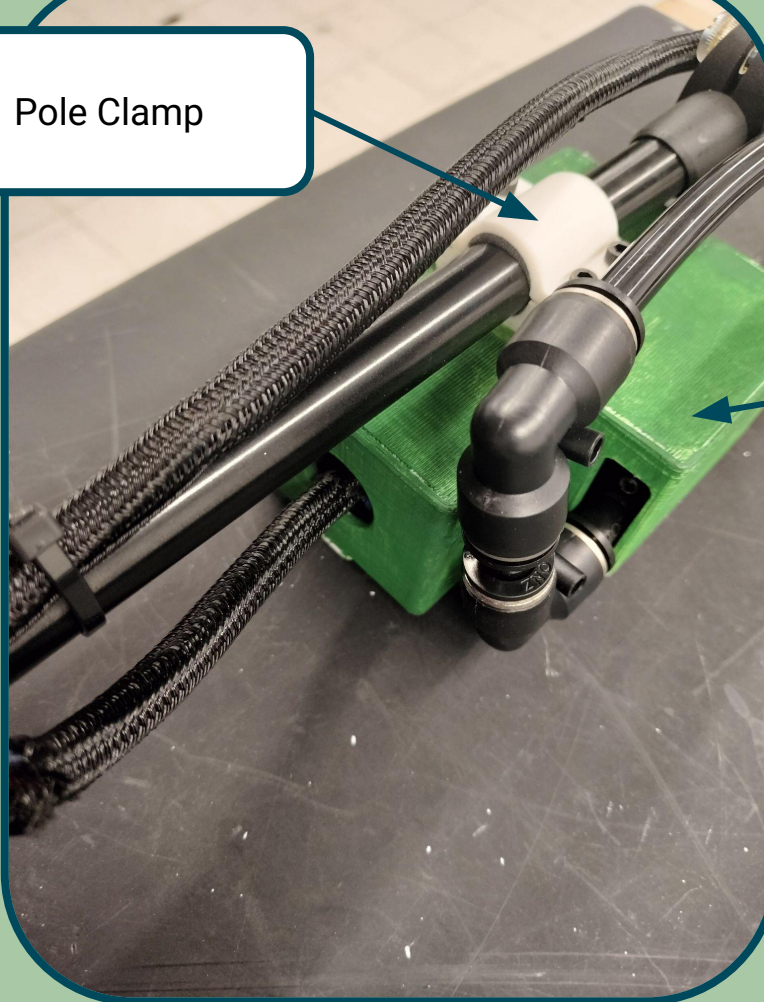


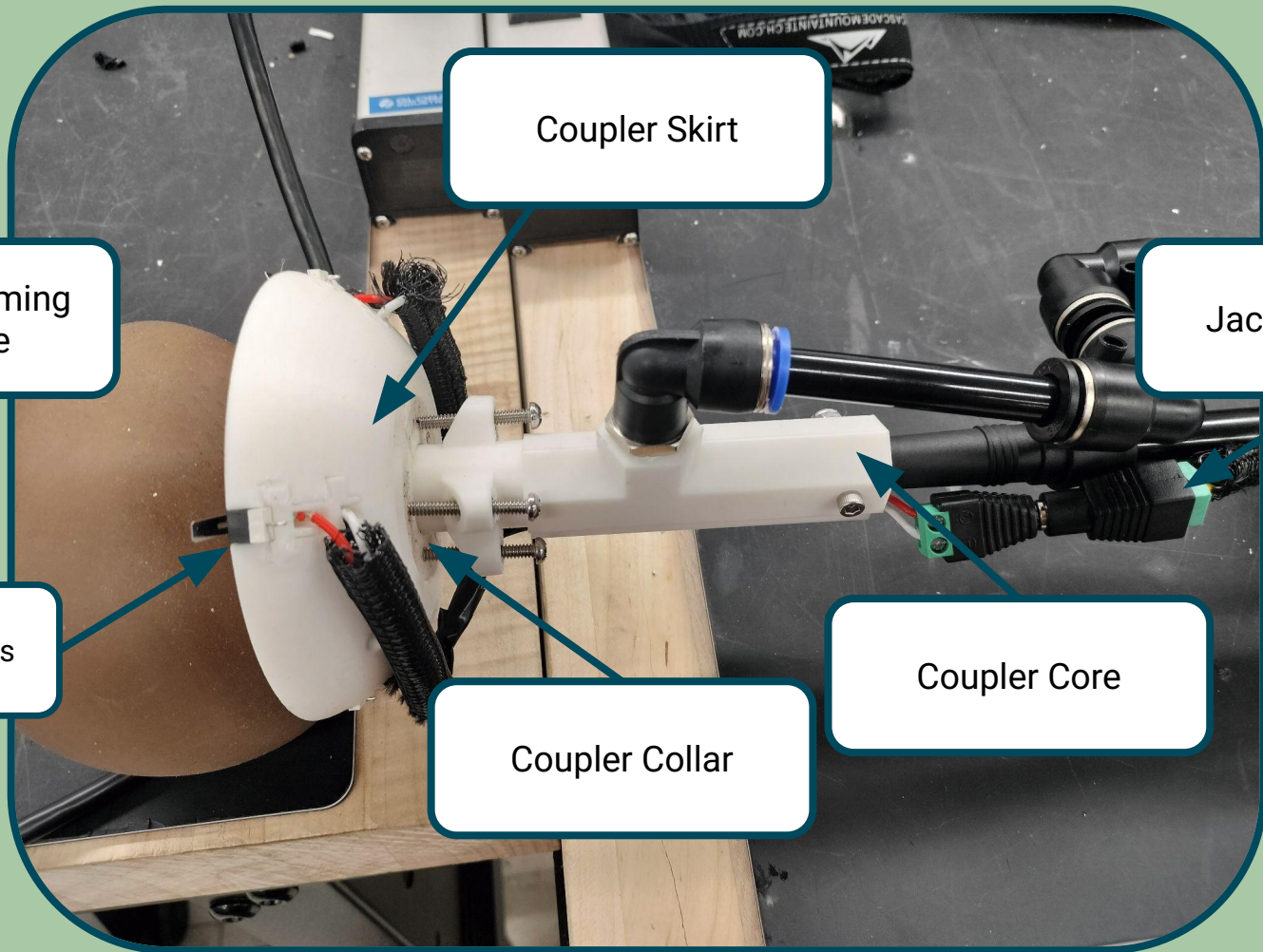
NFPA 70-75 Compliant

Pump Housing

Pole Clamp

81 kPa Pump
Housing





Core

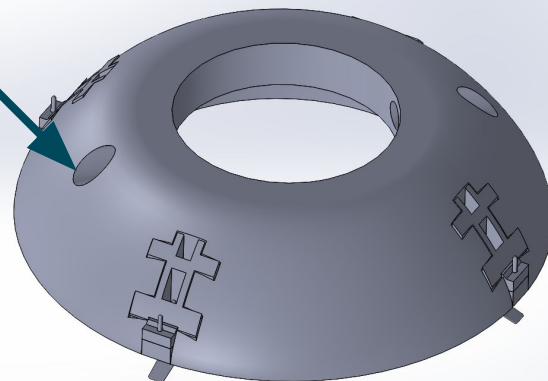
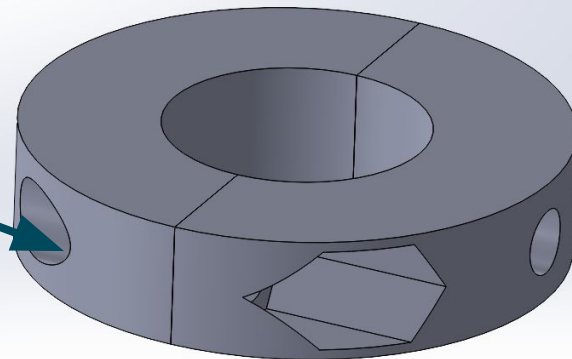
Wire Channel

Air Channel

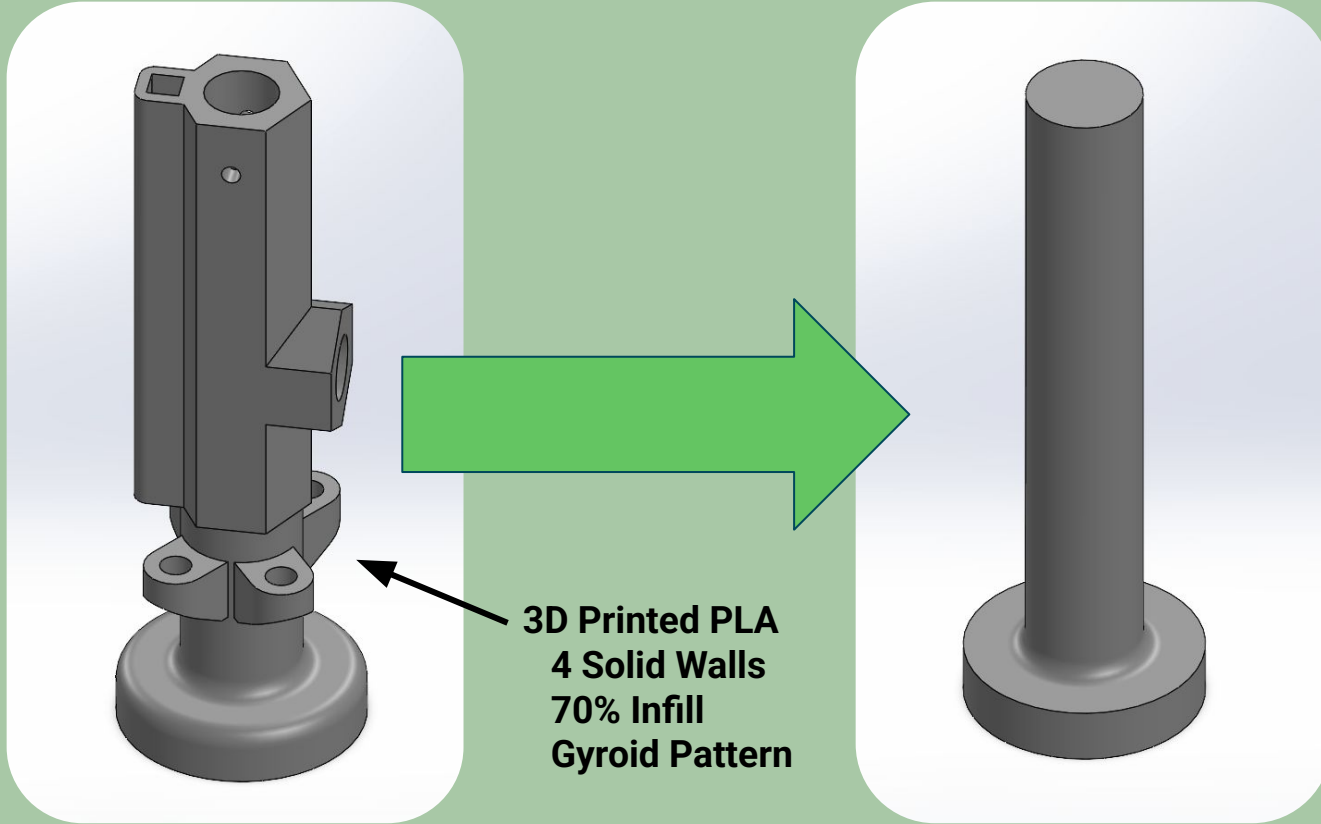
Replaceable Filter

Retention Collar

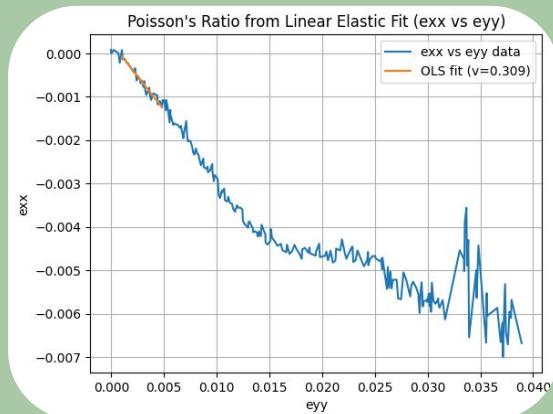
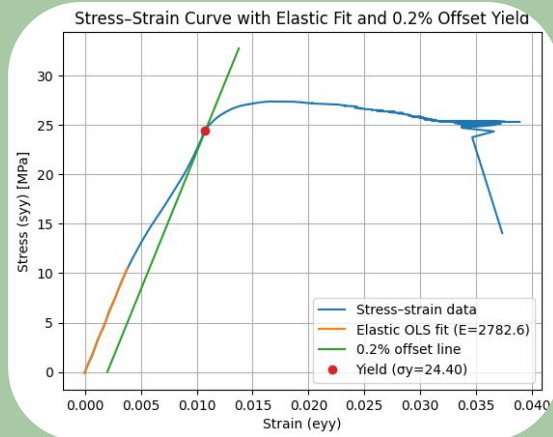
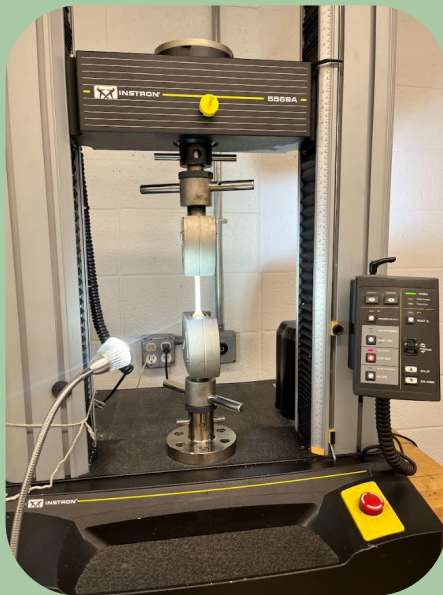
Skirt & Sensors



Coupler FEA Analysis



PLA Properties

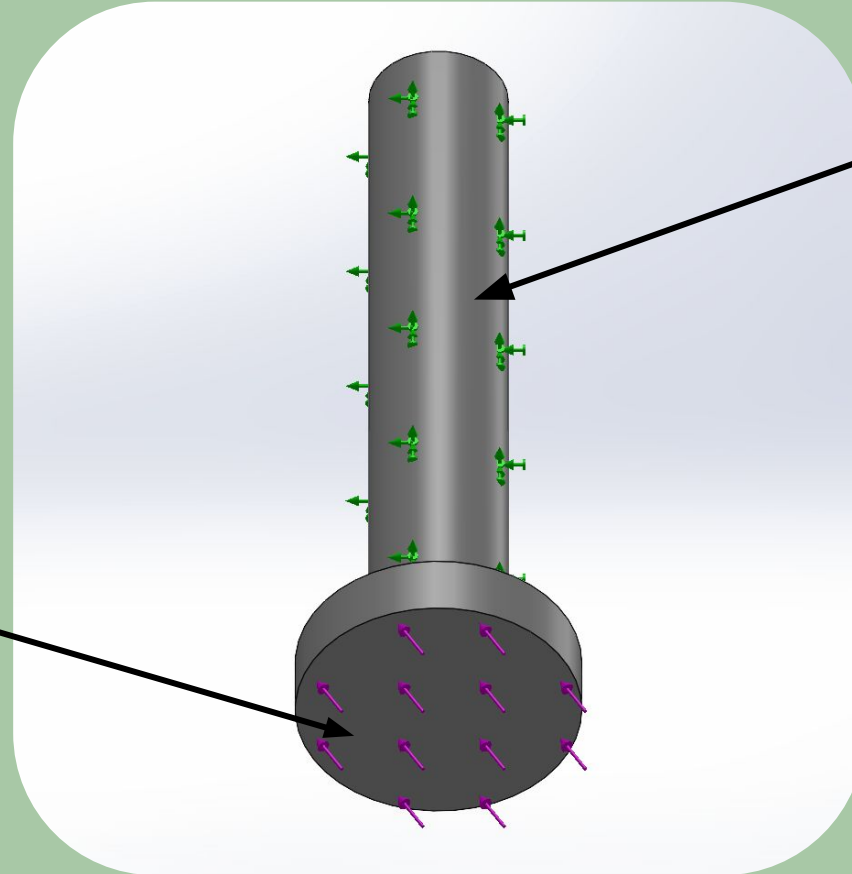


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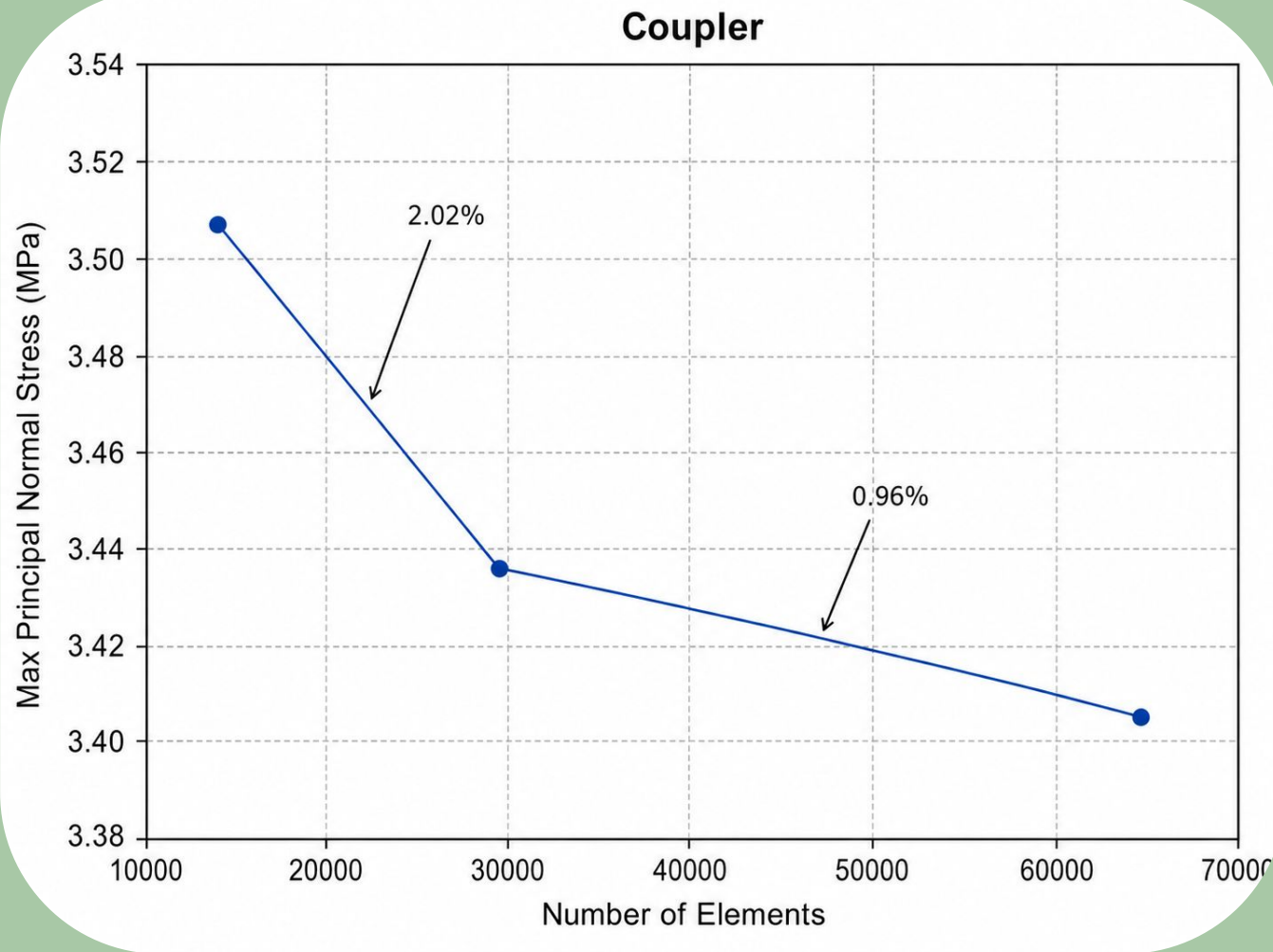
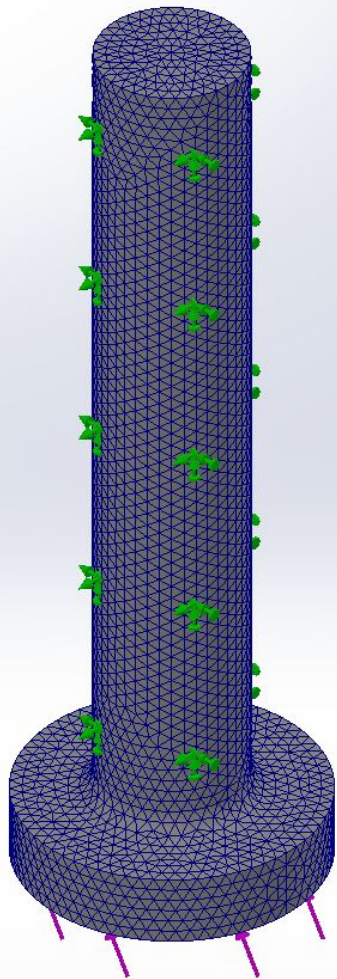
Hiking poles are rated to take 30% of the average weight

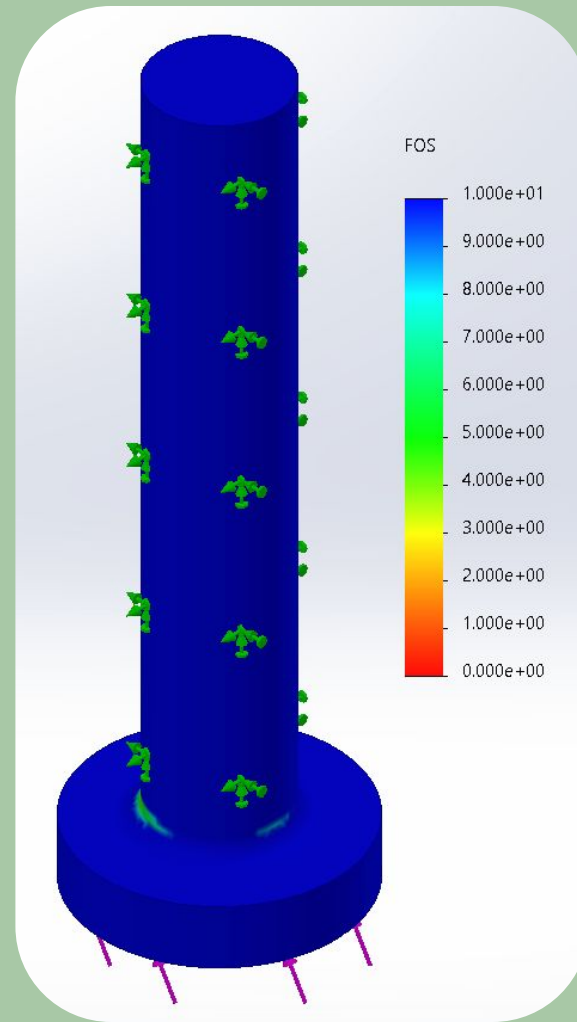
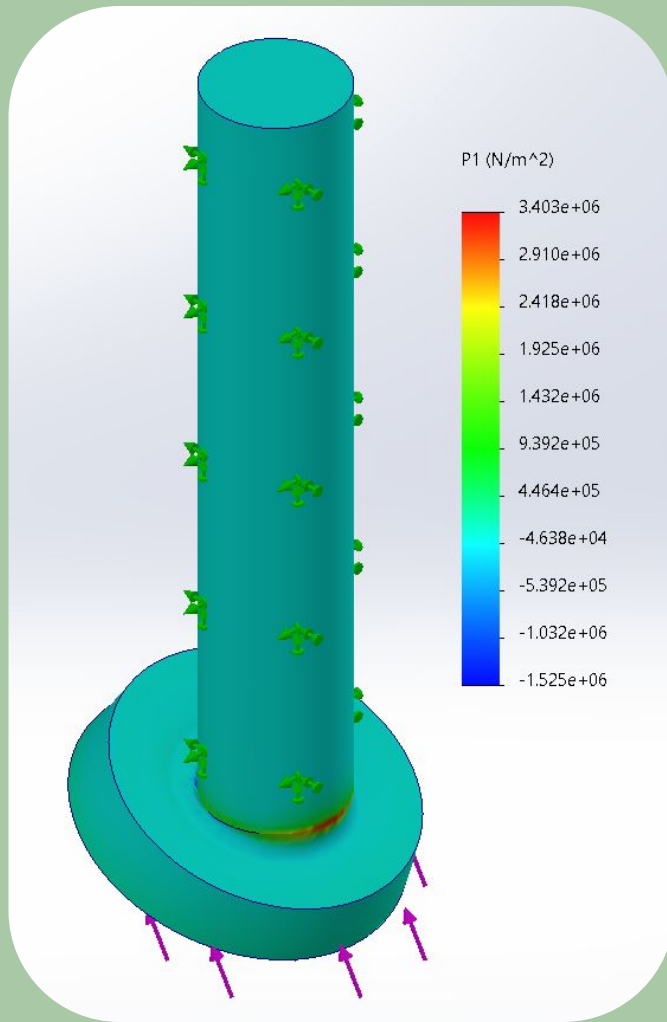
30% of average male weight of 90.6 kg is 27.18 kg = ~ 266.6 N

Worst case assume all load is acting 45° to this face



Assume fixed since the couper is attached to the hiking pole here





Experimental Comparison (Shear Analysis)



50 lbs!

Future Goals

- Reversible Airflow
- Smaller Electronic Packages
 - Lightweight Pumps





CLOSING THOUGHTS



