



Final Presentation: Group 5

Pipeline Sampling Tool

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A decorative mechanical frame surrounds the central text. It features teal and yellow gears of various sizes at the corners, connected by green pistons and red rods. The background is a light gray with a fine dot pattern.

What is our Problem?

To design a modular, fail-safe samplings tool for CNL
that can extract metal samples from pipelines

Introduction



Final Prototype III

Wheel Mount and Wheel Design

The final wheel frame was printed using updated CAD and corrected measurement values, significantly improving tool balance and allowing it to pass through the test pipe section more smoothly.

Scarping Tool

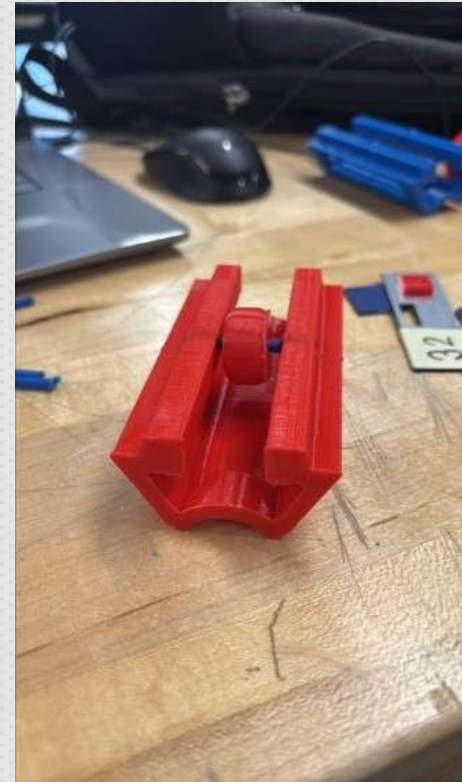
The chosen chisel is designed to remain sharp and resist damage. It's mounted in a 3D-printed rotating holder, which allows it to adjust its angle.

Collection System

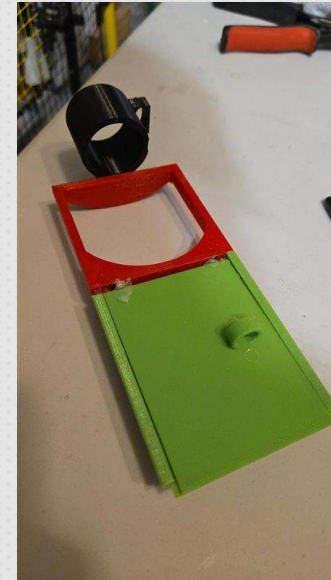
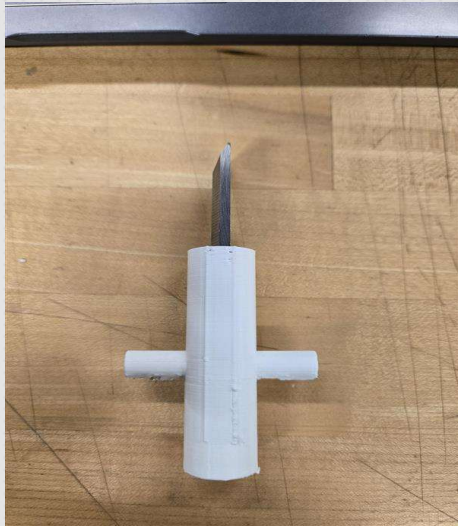
The collection box is now equipped with a sliding cover with a magnet for sealing. Added a circular connector that matches the diameter of PVC to secure the collection box to the main body.

Solution

Final Prototype III



Final Prototype III



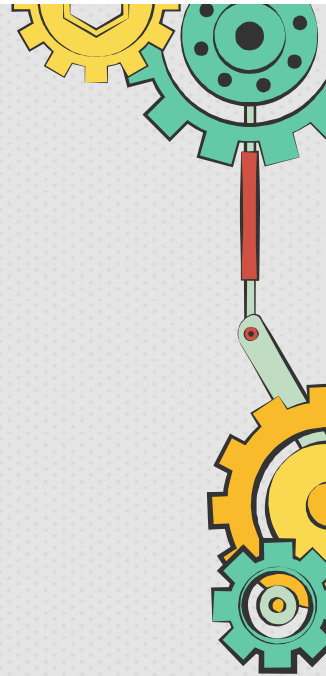
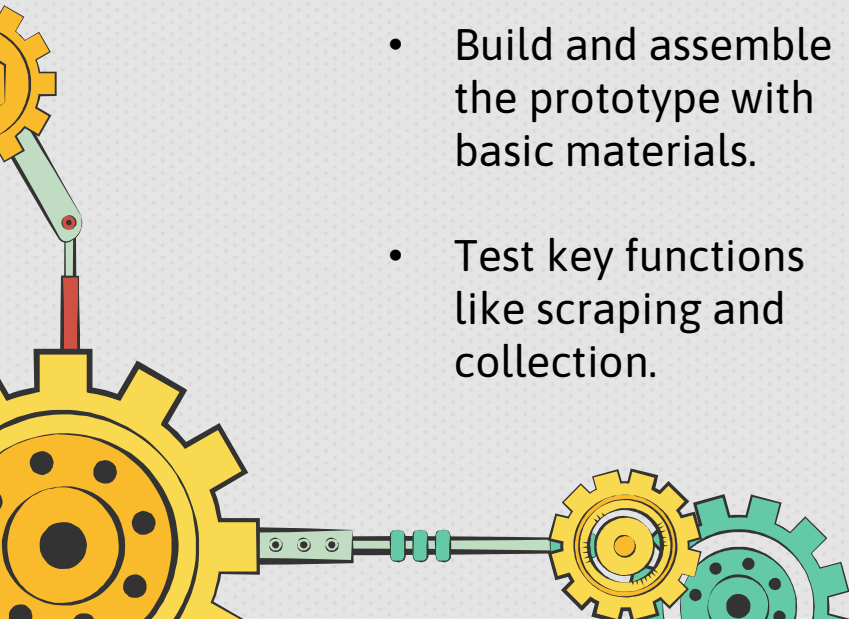
Prototype I

Design Process

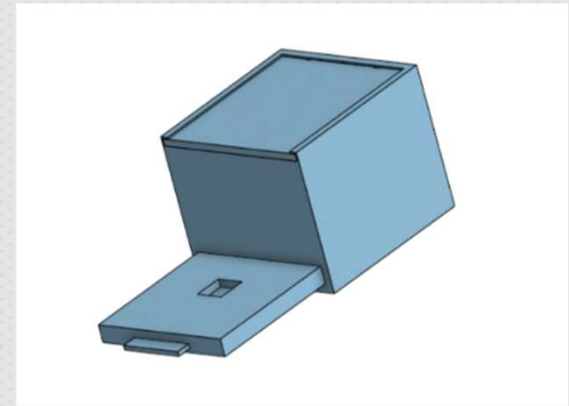
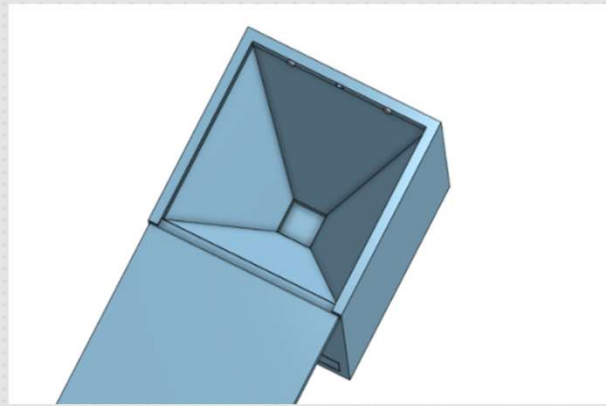
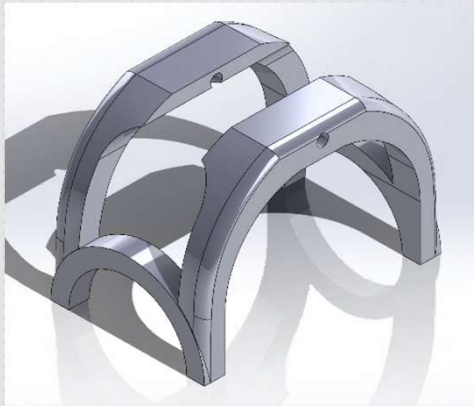
- Sketch designs and modifications based on feedback.
- Build and assemble the prototype with basic materials.
- Test key functions like scraping and collection.

Components

- Scraping System
- Collection System
- Feedback System
- Wheel & Mount



Prototype I





Prototype II

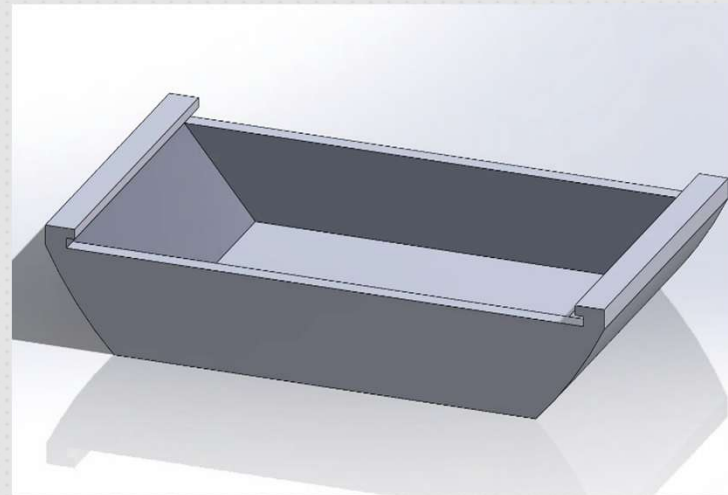
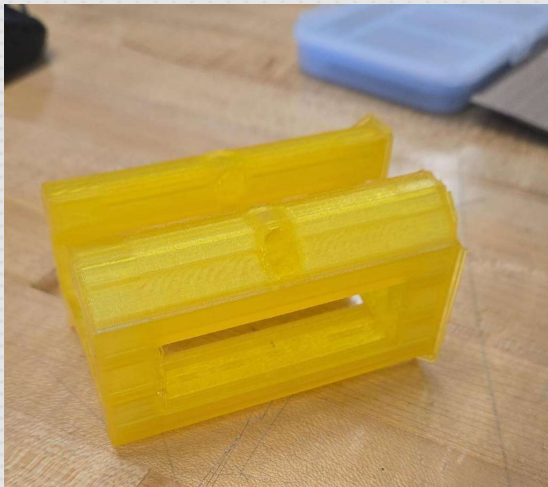
Development

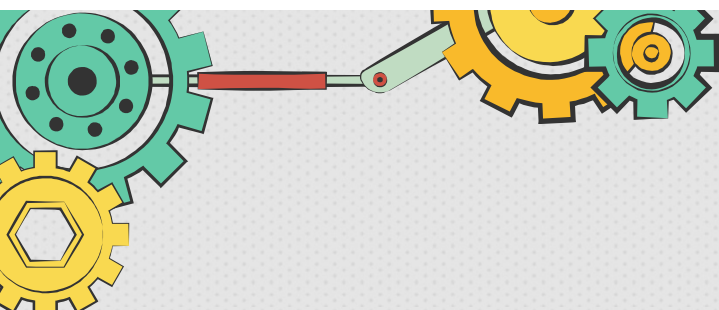
- Use a chisel instead of the knife for scraping.
- Improve collection system with more secure lids.
- Enhance wheel mount design for stability.

Components

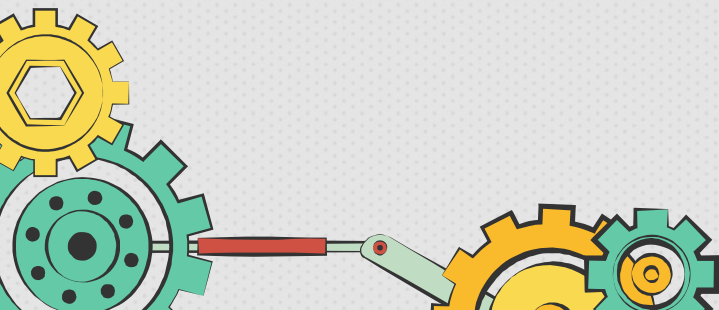
- Scraping Tool
- Collection System
- Wheel Mount & Wheels

Prototype II





Bill of Materials



Material	Amount	Cost (CAD with tax included)	Source
Chisel	1	Already in possession	N/A
3d printing filament	Undetermined	Free	
3/4in diameter, 5ft PEX pipes	3	13.5	Home Depot
Metal Spacers	6	Already in Possession	N/A
10ft PVC pipes (1in diameter)	2	18.23	Home Depot
Female PVC couplings	2	4.23	Home Depot
Male PVC couplings	2	3.44	Home Depot
PEX pipe connectors	2	4.25	
Hot glue gun	NA	Already in possession	NA
PVC glue	NA	1.04	Home Depot
Magnets	60 pack	7.91	Amazon
50ft Metal Wire	1	10.86	Home Depot
Metal Wire Ferrules	10	7.1	Home Depot
Final Total		71.86	

The image features a light gray background with a fine, repeating dot pattern. In each of the four corners, there is a decorative mechanical assembly. These assemblies consist of yellow gears of various sizes, green levers, and red connecting rods, all rendered in a stylized, cartoonish manner. The text "Thank You !" is centered in the middle of the page in a simple, black, sans-serif font.

Thank You !