Group 14’s

Design Presentation

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Where we were

Difficulties:

- Bill of Material

Prototype 1

- Simple modelling
- Cheaply made
- Rough but effective


KFC
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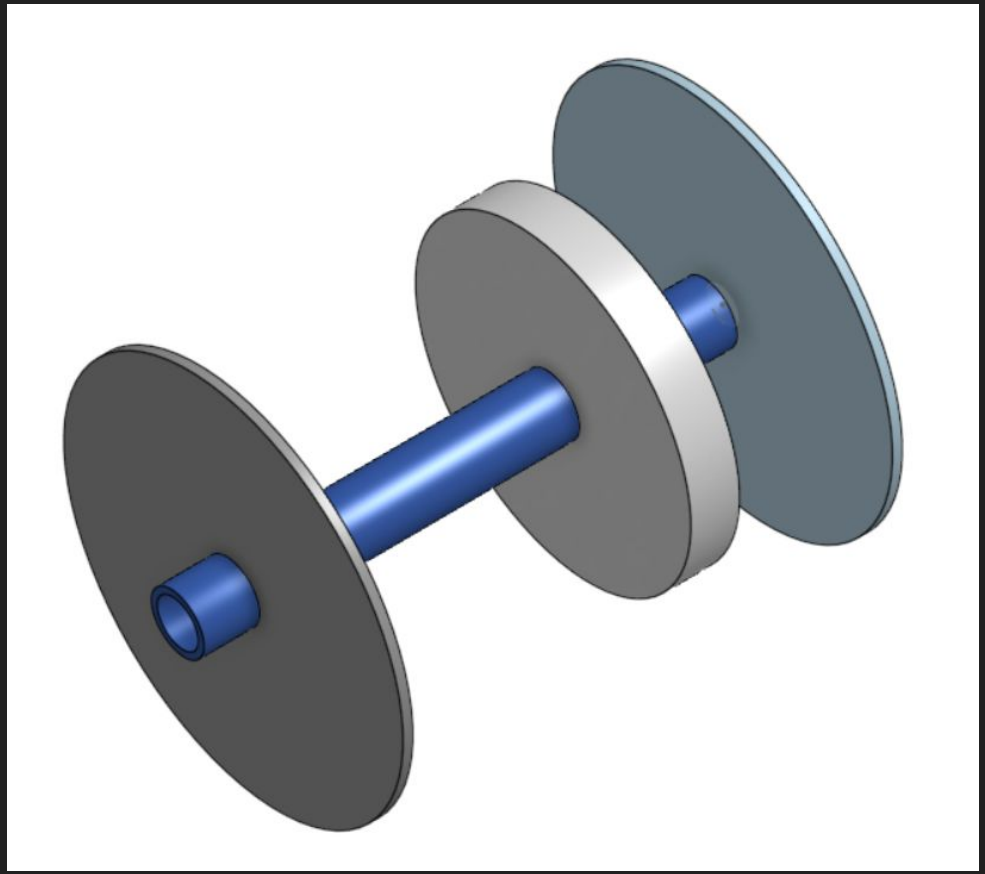
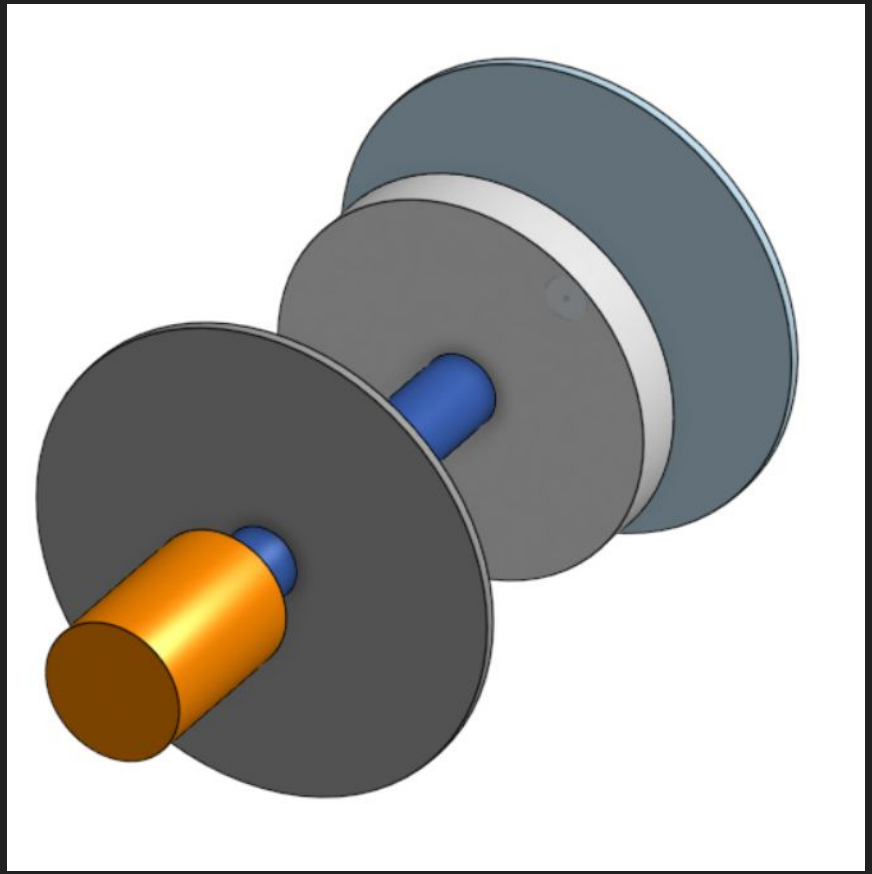
Results of Prototype 1

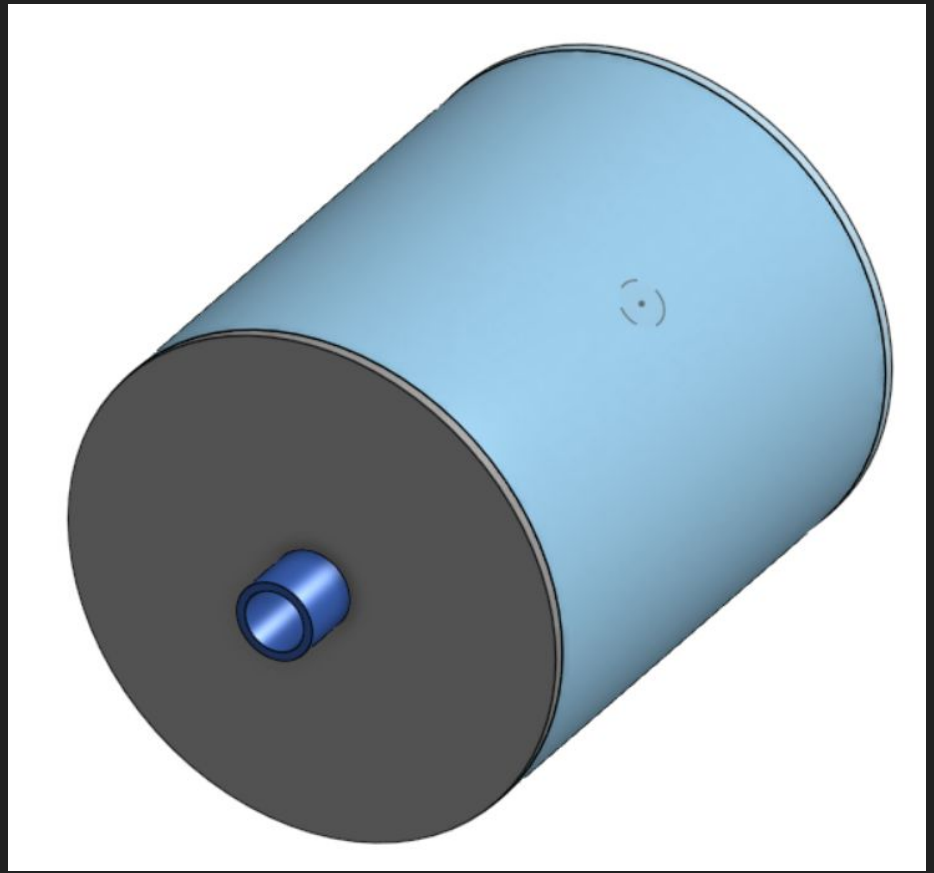
- Establishes how the subsystems connect with one another to perform their intended duties.
- Highlights difficulties in assembly of the overall system.
- Highlights the dependencies of subsystems.
- Simulates the assembly of the overall system.

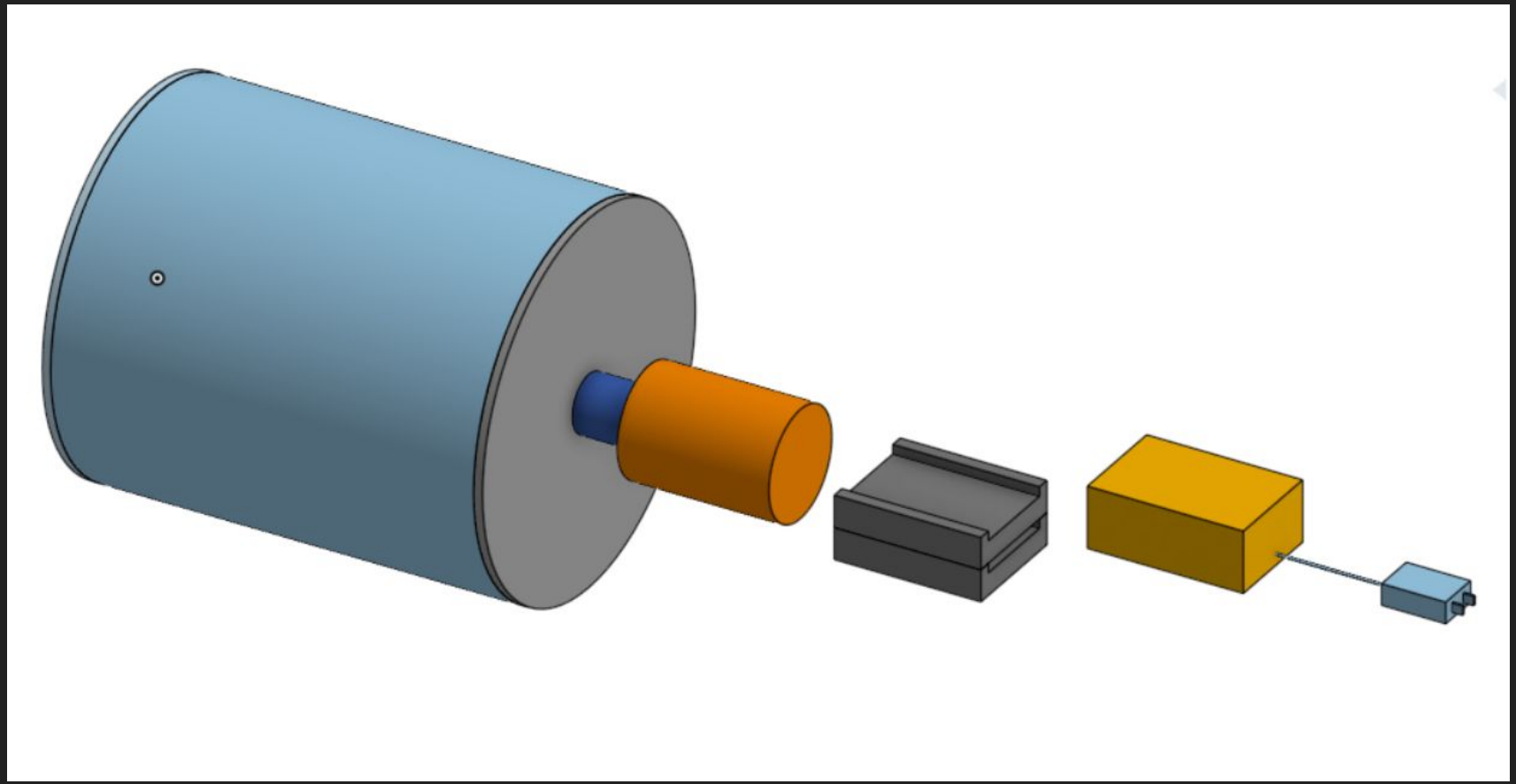
Prototype 2

- Finalized bill of materials.
- CAD designs of subsystems.
- Builds off the ideas of prototype 1.
- Accurately takes into account size and dimensions.









Results of Prototype 2

- Many of the same results as prototype 1

Main key differences:

- Shows the actual scale of the subsystems in proportion to one another.
- Highlights the need for supporting structures for certain parts.

Finalized Bill of Materials

Part	Cost
Bucket Tank	<$10
PVC Axle	$6.30
Seals	$6.00
Plug	$3.65

Finalized Bill of Materials

12V Brushless Motor	$18.80
Arduino UNO R3	$15.25
Motor Shield	$10.10
12V Power Adapter	$17.00
Wiring	$1.60
A/B Cable	$2.75

Test Plan

Determine functionality of motor
Functional prototype using a physical test
Once the motor is set up, the speed would be set in the arduino code and changed between speeds and tests. The end function would also be tested as well.
Roughly ~30-60 minutes, start by the 16th of March

Prototype Testing

Determine Compatibility of parts within the system
Functional prototype using a physical test
Once all of the parts have come in, we will test to make sure that the axle can fit in with the motor head as well as the sample disc which would be connected to the axle
~ 15 - 30 minutes, start by the 16th of March

Test Plan

Examine the involuntary leakage of water through the upper overture where the motor is located.
Beside the movement of water and sand inside, we will move the whole system to prevent any water drainage. Lopsiding it to see if with the pass of time water leaks.
Knowing if the water is coming out or possibly spilling/damaging the motor or electrical components.
30-60 minutes. March 16th

Test Plan

Determine how the abrasives affect degradation. Determine the ideal amount of abrasives to use.
For a set environment and fixed motor speed, run the motor with varying amounts of abrasives used.
Measure the mass of abrasives and water used. Compare the resulting mass change in degraded part.
Run each trial for 10 to 20 minutes. For a test of 3 trials, the test should take 30 minutes to 1 hour.

Test Plan

Long term testing of the whole system
Functional prototype using a physical test in order to determine the longevity of the code use itself
Once the system is set up, it will be run for an extended period of time to measure for any possible issues when operating the system.
~ 2 - 3 hours, start by 23rd of March

Thanks for Listening!

Any questions?