ME 486C Kinetic Sculpture 2018-2019
Team 18F02 Kinetic A

Midpoint Presentation

Holden Chapin, Joshua Glenn, Dylan Lovato, Jonathan Walgren

Project Description

Dylan Lovato
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

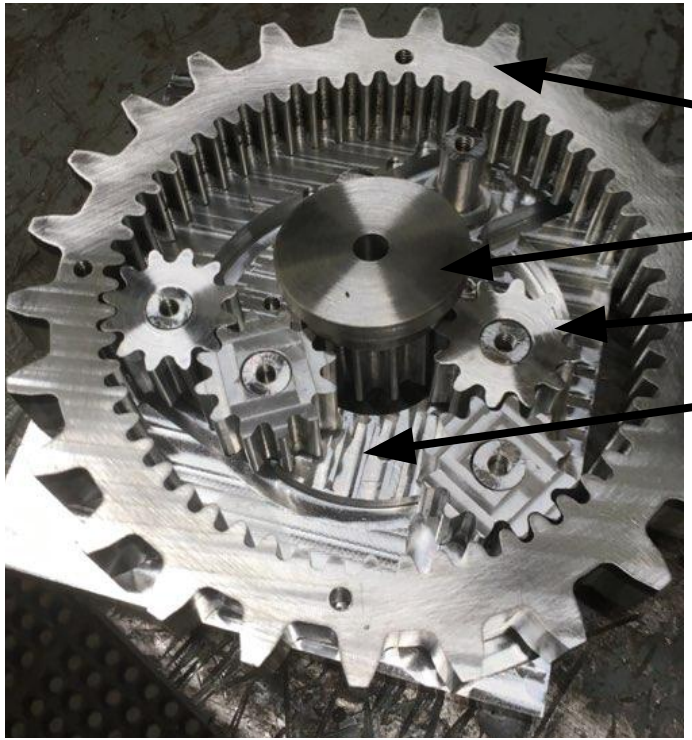
- Create a kinetic sculpture that showcases at least 3 engineering characteristics
- Main CR's: represent engineering characteristics, aesthetically pleasing, and reliable

Archimedes Screw Gear

Worm Gear

Project Description (cont.)

Dylan Lovato
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A



Main Gear Set

Updates

Joshua Glenn
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

- Melted 1480 aluminum cans into 42 (around) ½ pound aluminum ingots
  - 7 hour process
  - Created 34 lbs of slag
- CnC process has been initiated for the major components and is over half way complete

Updates (cont.)

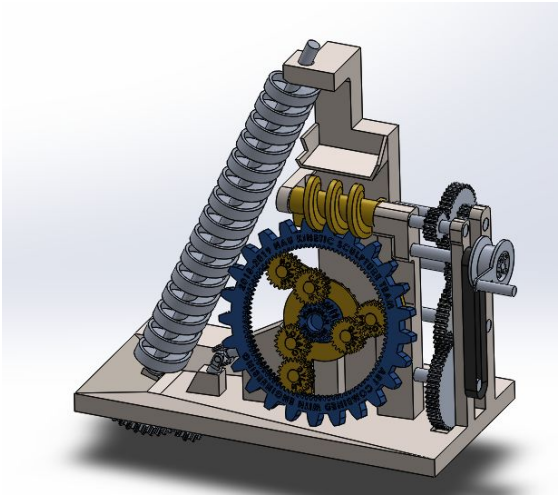
Joshua Glenn
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

- Crucible explosion
  - 2 week setback
  - Inner walls of foundry destroyed
  - Third flawed crucible given by supplier
- Redesign: ½ Scale Model
  - Options were to 3D print or scale down project
  - Client (Dr. Oman) chose to half scale the project

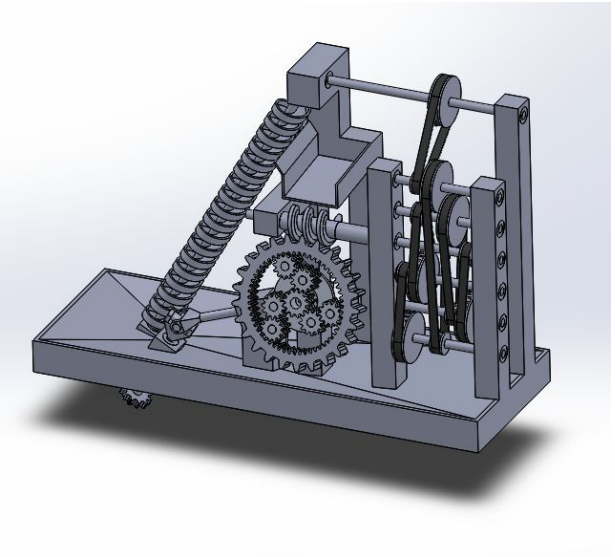
Updates (cont.)

Joshua Glenn
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

Old Model



New Model



Moving Forward

Jonathan Walgren
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

Analytical Analysis

- Belt Life Cycle Analysis - Shortest belt life is 406 hours and longest is 10,700 hours
- Scissor Lift Analysis - Allows us to find the force required for a hydraulic to lift the sculpture
- Surface Treatment Analysis - Carburizing and Tempering are not time effective, Shot Peening is likely to Create added friction throughout system
- Main Gear Set Power Analysis - Allows us to control the flowrate of the oil in the Archimedes Screw

Moving Forward (Contd.)

Jonathan Walgren
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

Manufacturing Left

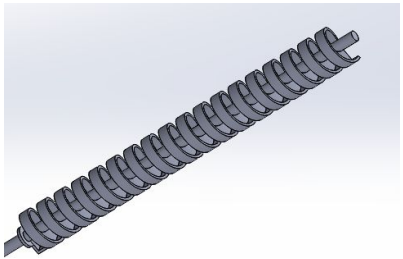
Archimedes Screw - Manufactured with sheet metal and a steel rod

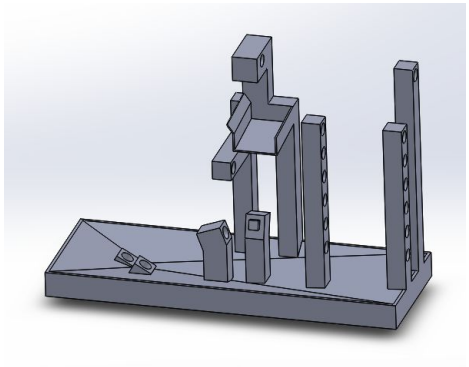
Frame - Manufactured with 1.5” X 1.5” square tubing and plexiglass

Stand - Manufactured with 1.5” X 1.5” square tubing and sheet metal

Gears - Some gears still need to be Machined from Aluminum

Plaque - Engraved with engineering principles with CNC mill

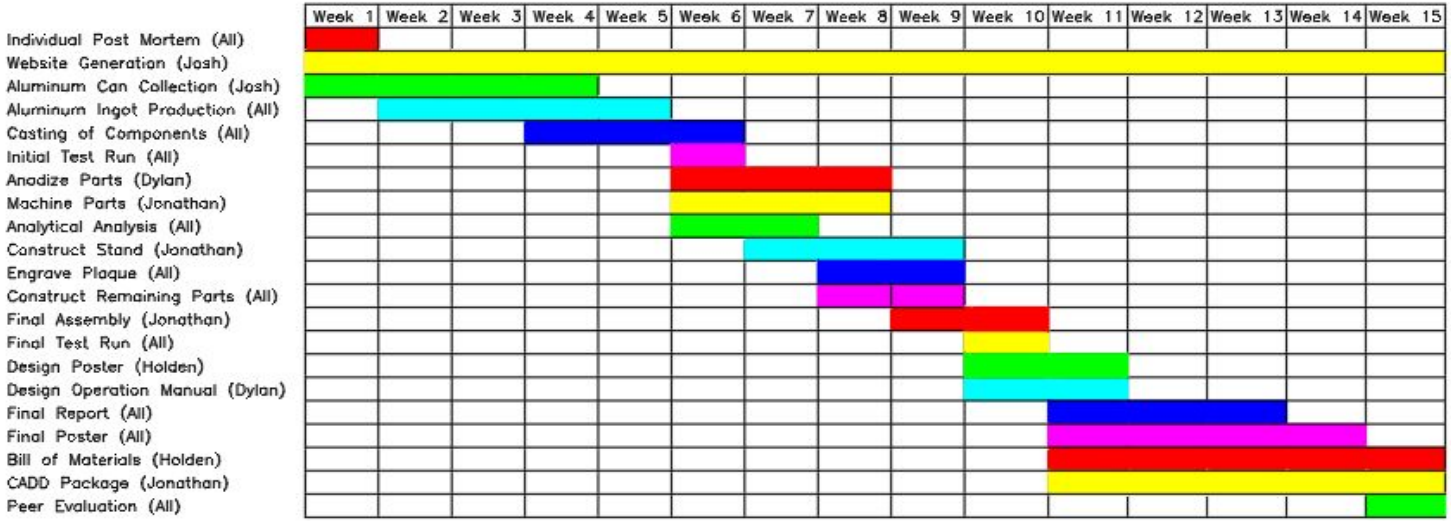




Schedule and Budget

Holden Chapin
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

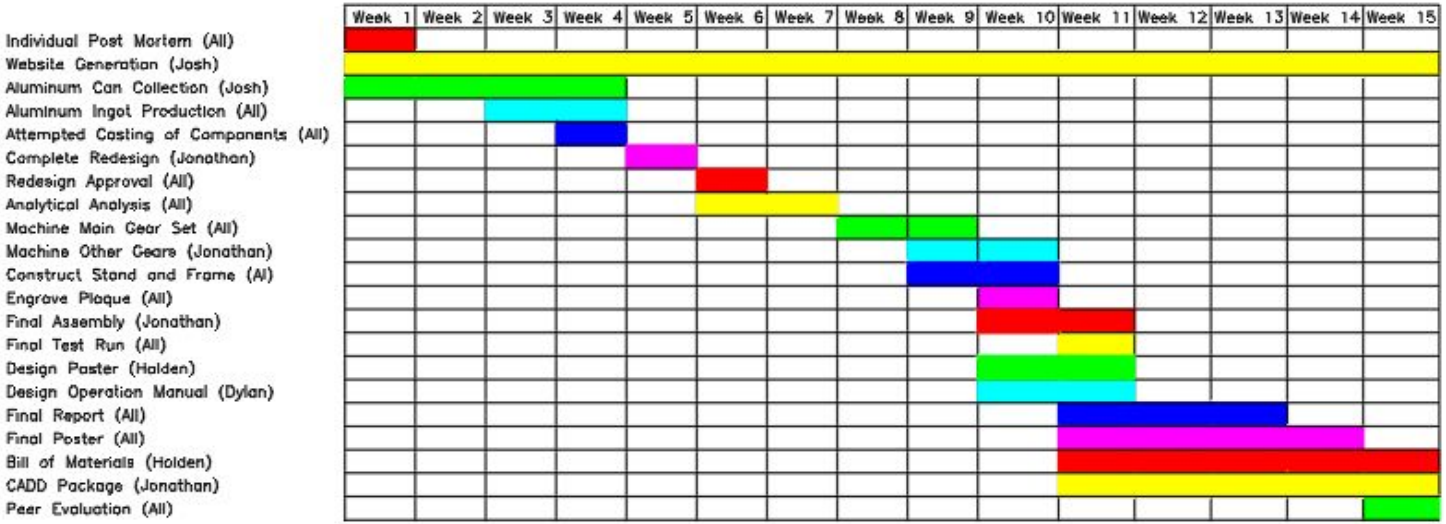
Previous Gantt Chart



Schedule and Budget (Cont.)

Holden Chapin
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

Updated Gantt Chart



Schedule and Budget (Cont.)

Holden Chapin
March 11, 2019
Kinetic Sculpture
Team 18F02 Kinetic A

Currently Spent

Total: $1699.24
Prototype: $190.01
Foundries: $213.91
Casting Process: $402.60
Can Collection: $21.94
Raw Materials: $349.42
Timing Pulleys and Belts: $413.75
Plaque: $27.31
Wheels and Bearings: $80.30

Anticipated Expenses

Archimedes Screw: $50.00
Steel For Frame: $100.00
Plexiglass: $100.00

Total Budget: $2525

Anticipated Total: $1949.24

Remaining Budget: $575.76

Thanks & Sponsors

GREEN FUND

PONDEROSA FIRE DEPT.

Special Thanks To:
Dr. Constantin Ciocanel, Dr. Stephanie Hurst, Dr. Michael V. Lee, Dr. Sarah Oman, Kay Pinto, Singne Slayton, Dr. Jennifer Wade

Questions?