Catapult Design
Dutch Masters Co.

- Group Leader: Teddy Deligianis
- Co-Workers: Frank Mader, Sarah Marnhout, Jonathan Ripper, Jonathan Beckley

Frank, Jon R., Teddy, Jon B., Sarah
Introduction of What to Expect

Teddy:
- Intro Assignment

Frank:
- Brainsotrmimg and Ideas

Sarah:
- Problems and Solutions

Jonathan R.:
- Solutions and Prototype

Jonathan B.:
- Final Design
  - Additional Solutions and Testing

Teddy:
- Advantages and Conclusion
Specifications and Objectives

- **Size:** 1.5’ x 1.5’ x 1.5’ (1.5 Cubic Feet)
- **Object Thrown:** Golf Ball (50 Grams)
- **Target:** 3” Bullseye within a 26” cubic target standing 7.5” off the ground.
- **Miscellaneous**
  - Be able to adjust aiming, force, and height.
  - Not allowed to have a mechanical device. (motors)
  - Has to be and look safe to use.
Brainstorm

- Types of brainstorming we used:
  - Group Discussion
  - Internet Resources
  - Individual Thoughts and Ideas
  - Library
## List of Ideas

- Spaghetti Spoon Arm
- Twisted Rope Force
- Metal Arm
- Wheels
- Flags
- Elastic Pulling Force
- Pin Trigger
- Stopping Bar
- Cloth Pouch
- Back Spring
- Dual Uprights
- Crank Gears and Lever
- Rubber Stopping Bar
- Turning Axle
- Weight Dropper
- Laser Scope
- Wood Arm
- Wood Base w/ Open Middle
Pros and Cons

- Spaghetti Spoon Arm
- Twisted Rope Force
- Metal Arm
- Wheels
- Flags
- Elastic Pulling Force
- Pin Trigger
- Stopping Bar
- Cloth Pouch

- Back Spring
- Dual Uprights
- Crank Gears and Lever
- Throwing spring
- Turning Axle
- Weight Dropper
- Laser Scope
- Wood Arm
- Wood Base w/ Open Middle
-Additional Ideas-

- Rat traps for force.
- Stopping chains.
- Solid, heavy wood base.
- Ice creams scoop arm.
Concerns of Brainstorming

- Safety Factor
- Consistency and Accuracy
- Durability
Safety

- The Stopping Chains
  - A stopping bar could cause injury and possibility of damaging the fire arm.

- The Trigger Mechanism
  - Was used to keep away from being too close to the catapult itself to activate safely.
Consistency and Accuracy~

- **The Chains**
  - The idea of chains was used to keep the length and strength consistent. The chains also allow to differentiate the accuracy of the object thrown.

- **The Rat Trap Springs**
  - The force was consistent every time in usage of the springs.
Durability~

- We chose our materials based on their strength to withhold the force of firing our design and also to remain strong throughout the testing and competitions.
1st Prototype-

- We Used:
  - 1 Rat Trap
  - An egg spoon
  - Steel wire
  - A thin metal chain as a stopping mechanism.
  - No trigger mechanism.
Prototype

- What it looked like.
Test-Results
Problems Found

- Everything:
  - The throwing arm was broken going into the prototype testing.
  - We had no trigger mechanism.
  - The performance wasn’t consistent.
  - The force needed to be increased.
  - The design jumped when launched.
  - The stopping chains broke and slid when fired.
Problems & Solutions

- The Arm: Used an Ice Cream Scoop.
- The Force: Instead of one rat trap, we used two.
- The Chain: A stronger more durable chain.
- The Firing Mechanism: Used a pin release trigger.
- The Moving of the Launcher: Heavy, old aged wood base.
Final Design

- Drawings of final design.
-Additional Problems-

- Not as Many:
  - The trigger mechanism was not in a good position for firing.
  - The accuracy was hitting above the bulls eye.
Testing

- Results from testing.
Advantages Over Competition

- The most accurate!
- The safest design on the market!
- The most creative!
- Very cost efficient!
- Was built by us, and only us!
  - (No Parents HELP!)