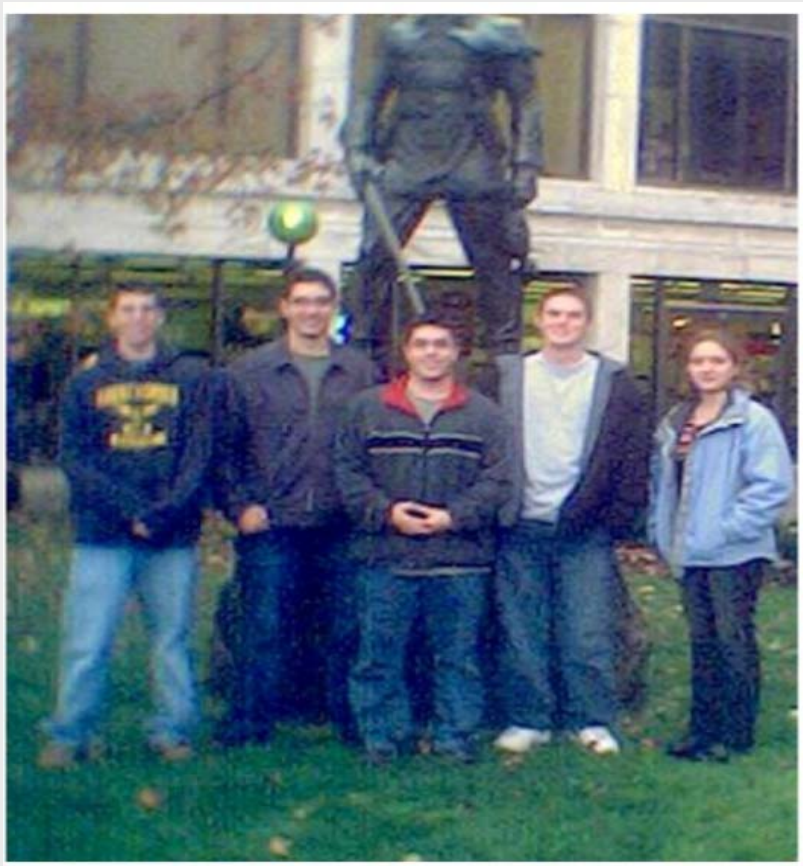
Catapult Design

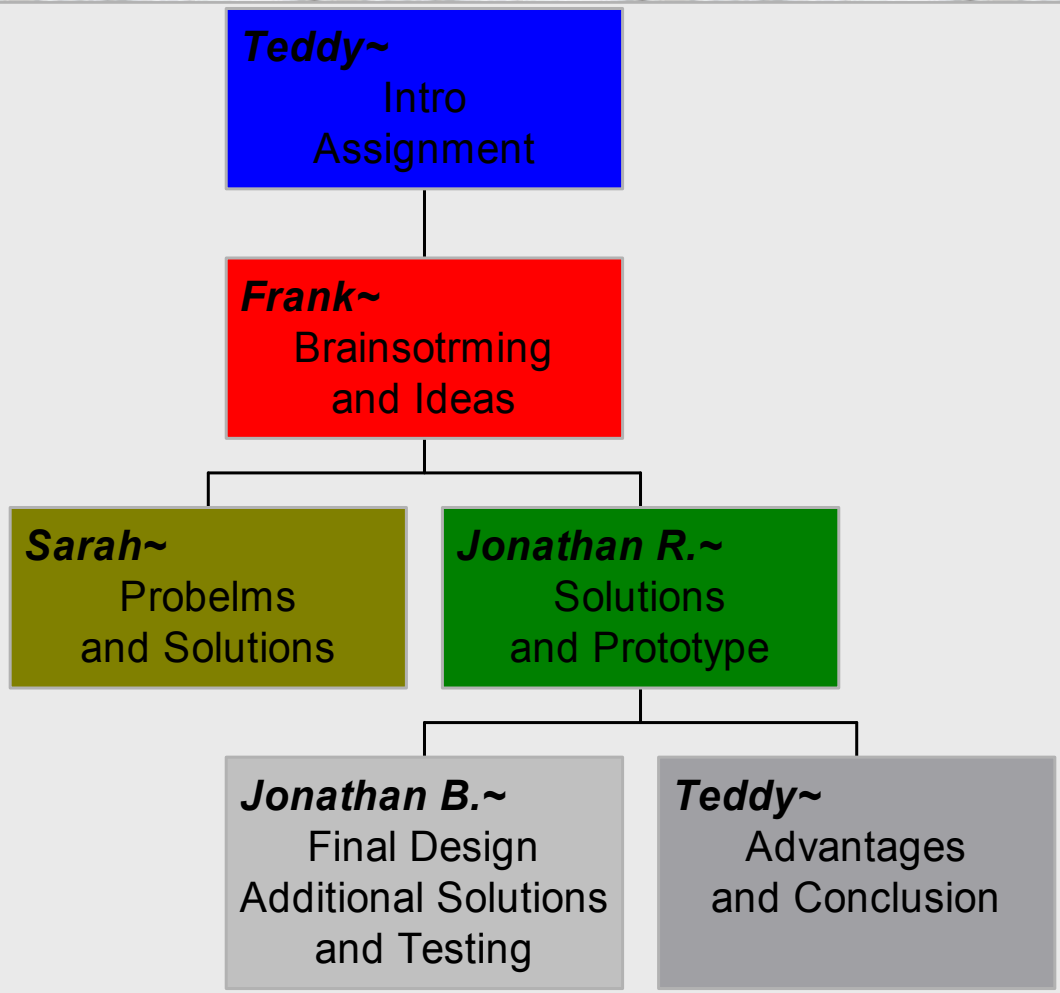
Dutch Masters Co.



Frank, Jon R., Teddy, Jon B., Sarah

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

Introduction of What to Expect

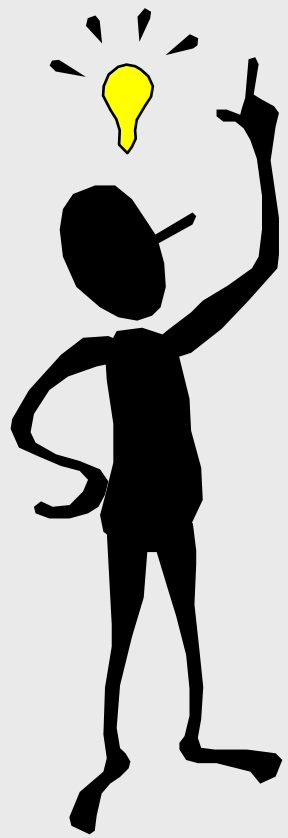


Specifications and Objectives

- **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.

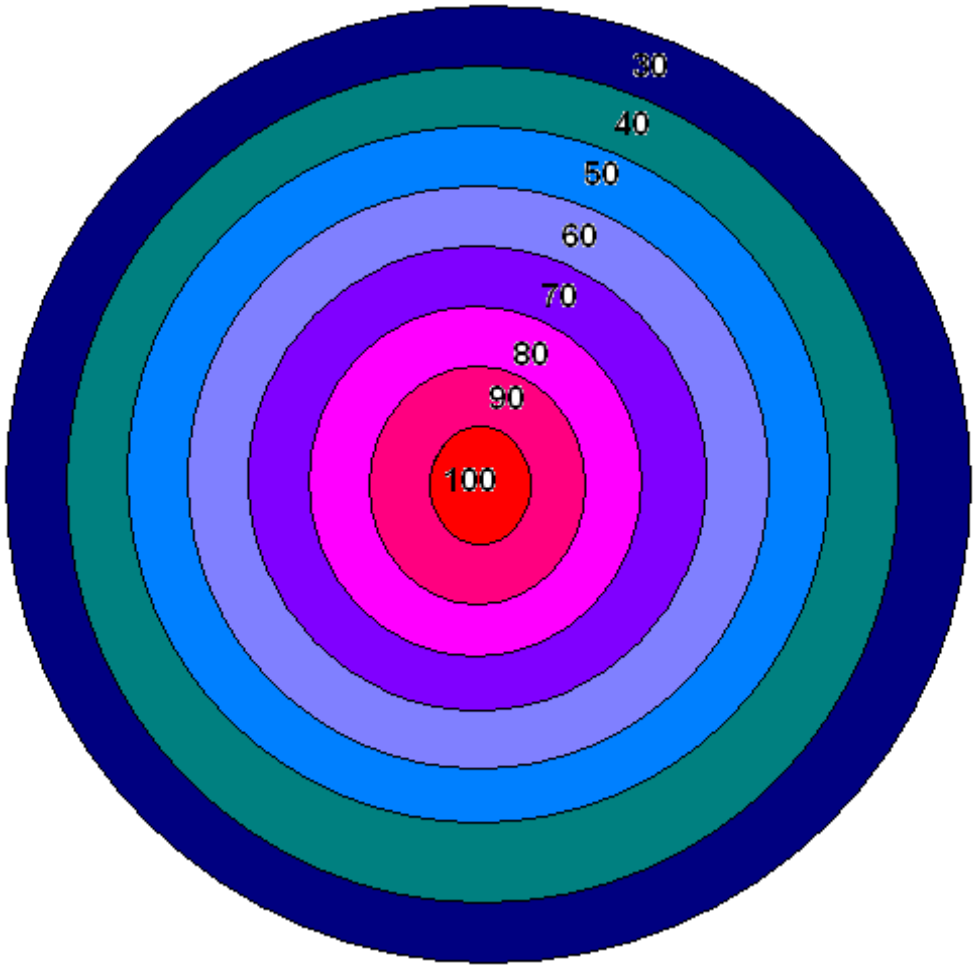
1st Prototype-

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

Prototype

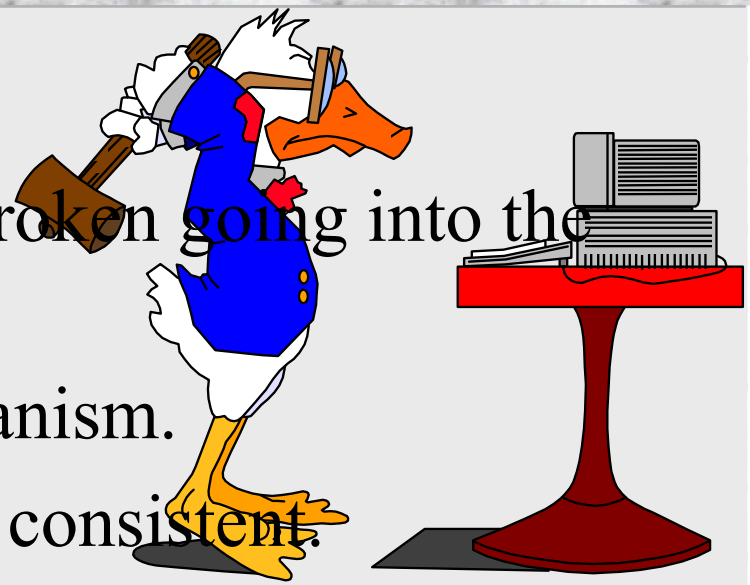
- What it looked like.

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.

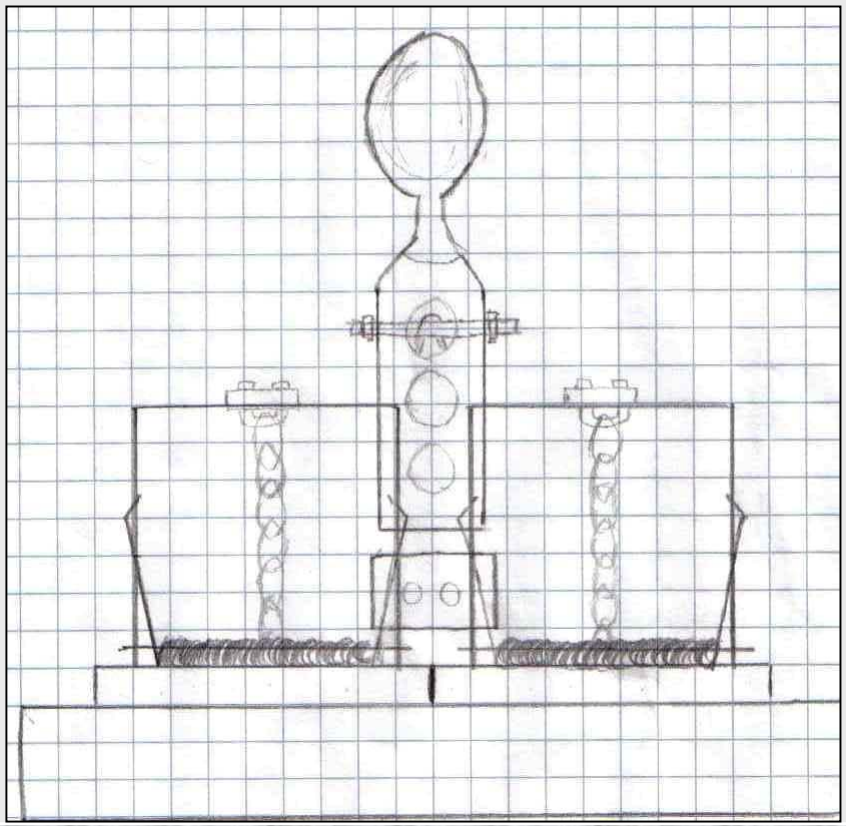


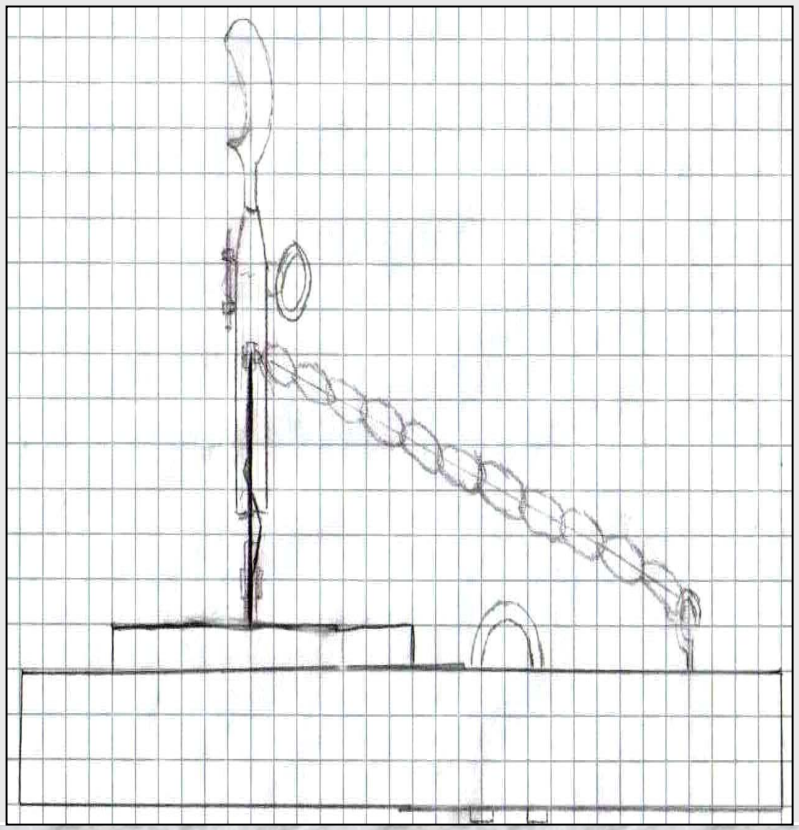
Problems & Solutions

- **The Arm:**
  - Used a 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!)

Future Improvements & Conclusion

Any Questions?