EMDC 2024

On Short Notice

Wildlands

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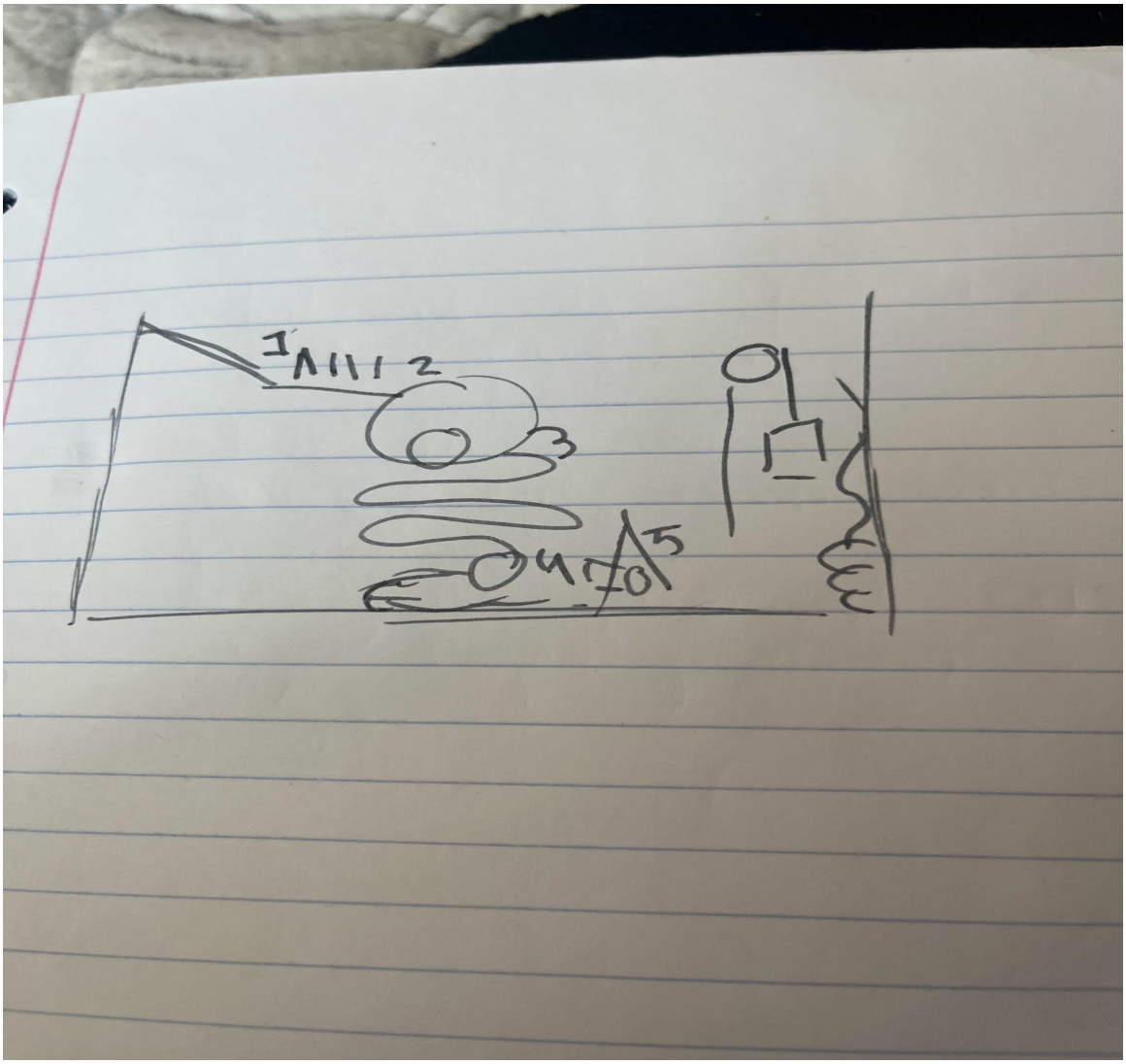
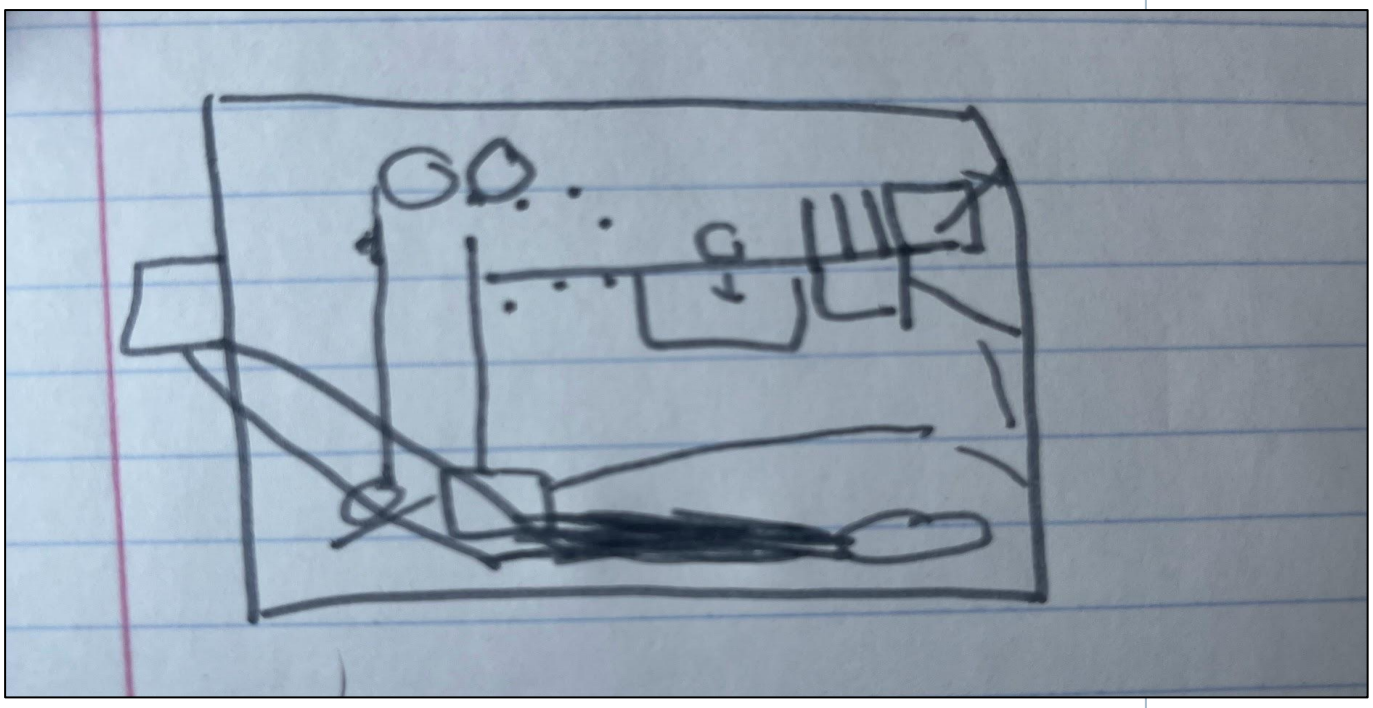
Planned Machine Design Sketch and Description | Sketch of planned machine with clearly articulated description of planned machine including labeled components with technical details (i.e. anticipated transfers of energy, directions of force, materials, etc.). This is the team's original plan, prior to building



The first step was going to be a ball hitting jenga blocks to hit a cup into a bubble. After that, we were going to have a balloon pop and have a marble continue down a tube to hit a gear. That was all we had planned out. For majority of the project, we just tinkered and made it up as we went.

Final (or Near Final) Machine Design Drawing/Image and Description | Drawing or image of final machine with clearly articulated description of machine and labeled components with technical details (i.e. observed transfers of energy, directions of force, pertinent material specs, electrical details, etc.).



In the top right corner is where the machine starts. We drop a wood ball down the ramp and from the momentum the ball has it hits jenga blocks down. The Jenga blocks hits a cup filled with baking soda that fall in to vinegar for a chemical reaction. THe wood ball will also hit a ping pong ball the rolls down ramps. The ping pong ball will hit another ball that will hit another ball into a container connected to a pulley system. From the pulley system moving it will trigger a gear to roll down and it will hit a marble. The marble will roll down and hit a car that hits a ball. The ball will hit mentos into Coke to set off another chemical reaction for the end.

List of Machine Steps | Clearly describe and number machine steps. Advanced Component steps clearly identified.

#1: Wooden ball hits ping pong ball

#2: Ping Pong ball hits jenga blocks

#3: Jenga blocks hit cup with baking soda into bucket of vinegar

#4: Ping Pong ball hits other Ping Pong ball

#5: Ping Pong ball falls into bucket moving a clay ball on string

#6: String moves wooden circle down a plinko like track

#7: Wooden circle hits marble

#8: Marble hits car

#9: Car hits Ping Pong ball

#10: Ping Pong ball hits mentos into Diet Cola

Cost of Machine and Percent of Recycled Materials Used | Complete itemization and calculations of machine cost and percent of recycled materials provided.

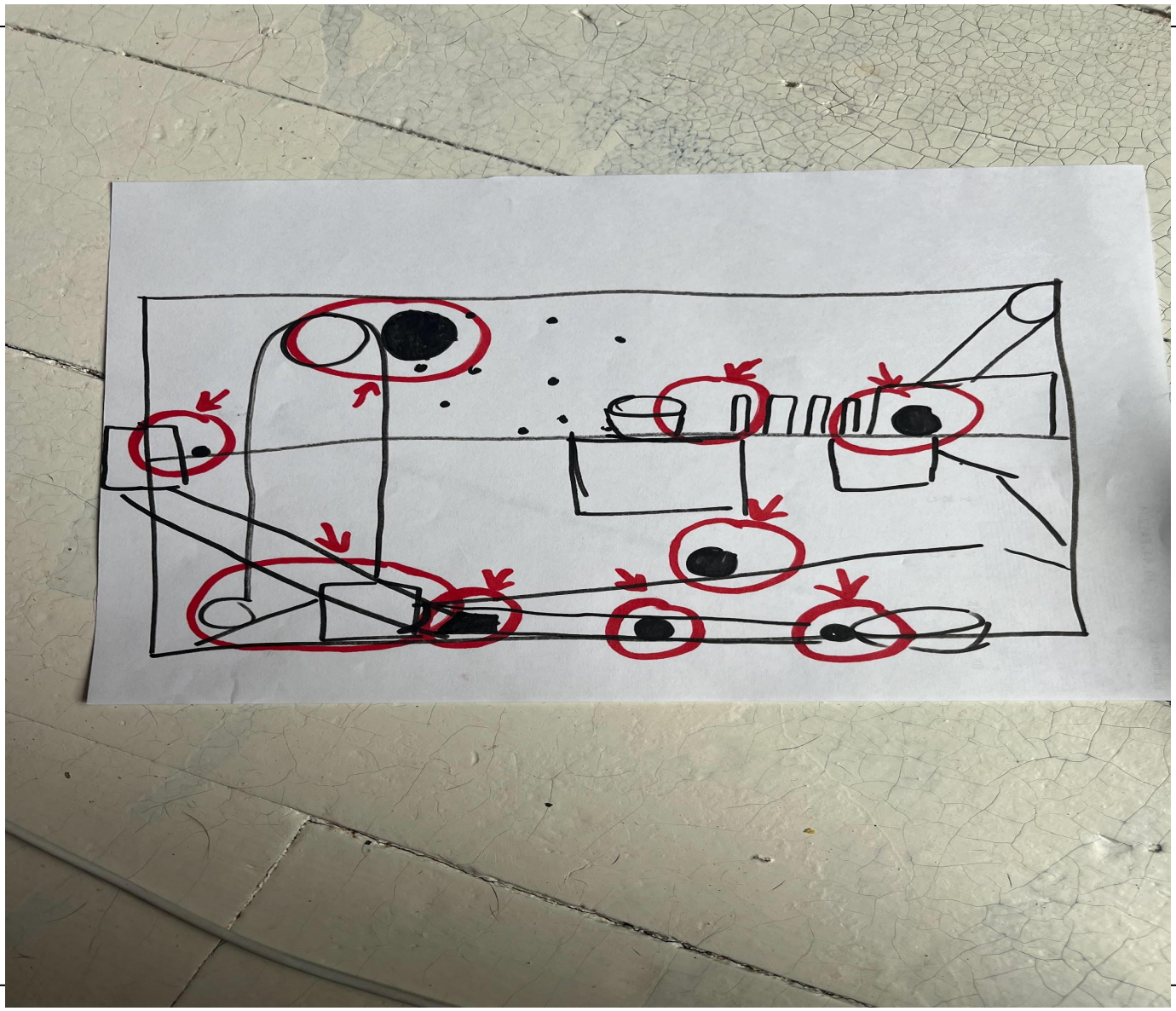
Item	Cost
Wood	Free
String	Free
Cardboard Tube	Free
Plastic Container	Free
Jenga Blocks	Free
Cups	Free
Cardboard	Free
Clay	$1
Pulley	Free
Balls	Free
Toy Car	Free
Vinegar	Free
Baking Soda	Free
Coke	$3
Mentos	$2
Screws	Free
Hot Glue	Free

Materials Cost Total - $6 Percent Recycled 83.33

Applied STEM Processes | Documentation (i.e. sketches, photos, etc.) of four or more applied STEM processes with clear details provided

- labels on sketched/images
- arrows indicating direction of motion/force
- written explanations

For Senior Division teams, this section should include the Advanced Components.



The first step is a wood ball will roll down this incline plane, the momentum from the ball going down the incline plane will transfer energy to this ping pong ball. The transfer of energy will also tip these jenga blocks over and make this cup filled with baking soda poor in to the vinegar. Then the ping pong ball will roll down an incline plane and the speed and mass of the ball going down the ramp will transfer its energy to this ping pong ball. The ball will fall into this Basket, this clay ball will move slightly to make the pulley string that make a gear roll down plinko. The gear will transfer its energy to a heavy marble that rolls down an incline plane tube and hit a car that will make a ping pong ball hit a marble that hits a mento into coke.

Reflection (1,500 word limit)|

Reflection highlighting

- learning or growth (i.e. hard or soft skills, knowledge, etc.) from start to end of build and
- connection to future application (i.e. future classes, projects, career, life).
- Three or more major successes/challenges identified with clear details.
- Include final work count. Reflections greater than 1,500 words will result in a 10-point penalty.

Engineering was a fun learning experience. We learned how to problem solve better and we also learned more about the human body. It was fun to make the chemical reactions and to see our whole machine come together. Some of the struggles were making the steps and making sure that all of our steps were reliable. We easily overcame challenges and grew as a group. We put our all into our project. At times, it was stressful and we felt pressured but once we got our project near finished, we felt a lot better. We really enjoyed engineering and would love to it again.

Diary of building process, photos, team biography, etc

2024 Engineering Journal

January 23rd 2024

Mrs Jen came today. She introduced the EMDC to us and explained the rules. We split up into groups and made rube goldberg machines out of scratch.

January 29th 2024

We made towers out of newspaper and a limited amount of tape. It was a challenge set by our coaches to test our engineering abilities

February 9th 2024

Today, We went to Building Hope to look for things for our bases. We only found pegboard.

February 23rd 2024

We started building our base. We put wheels and plywood on a recycled pallet from past projects.

February 27th 2024

We built our sides of the machine out of plywood and 2 by 4's. That was all we got done that day.

March 18th 2024

We finished our base and started to add some of our steps. We glued down a tube that a ball rolls through and the ball hits dominos that hit a cup.

March 20th, 2024

We added a basket and ramps to the side of our machine. No new steps were added.

March 21st, 2024

We added a few more steps to our machine including a ball falling into a basket and the plinko like step.

March 22nd, 2024

We added the last few steps of our machine and finished painting the background. We spent the day adding the finishing touches.

March 27th, 2024

We worked on our journal and painting the outside of our machine and adding the numbers and our team name to the machine.

March 28th, 2024

Today, We ran our machine and practiced our presentation. We finished our project and loaded in into the trailer to go to augusta.

April 4th, 2024

Today, We planned our changes to our machine before the State Competition. We planned on switching our cardboard ramps for wood and repainting everything to look more professional. We are also working on making our steps more reliable, because at the first competition some of our steps did not work as well as we planned.