Team Journal

Aiden, Israel, Daniel

Full Material List And Cost

Recycled or No cost

- Mouse trap #2
- Rocket
- 2 pulleys
- Scrap wood from shop
- Miscellaneous pvc track
- Twine
- Parachord
- Picture of planet
- Box
- Crowbar
- Nuts and bolts from shop
- Screws
- Marbles

Bought Items

- Funnel-37 cents
- Mouse trap #1-10 cents

85% recycled (Estimated by objects bought over items recycled)

First Planned Design Sketch

Our first design had the following steps; a marble would fall through a funnel and hit (still pending idea) witch would launch itself into the pendulum knocking it over then the pendulum would swing and hit a car that would fall into a cup witch is like a seesaw and it would push off a weight that would pull up a racket that would hit a button that turned on lights.



Most Recent Sketch

This wasn't our final design but I was the last recorded sketch. We took out the finale step with string lights and a switch(stars) and then revised the step with the pendulum and the step with the rocket. We also replaced the car with a marble and added many steps in between. We didn't do a very good job at showing what the components do because it was just a reminder of what we brainstormed.



Final Machine

We ended with 12 steps; many of which were in the original drafts but even more we simply improvised.



4 Stem Processes Used

Momentum

Examples: When the first marble is released, it gained momentum enough to knock over a weight. The angle of the first track allows for the marble to gain velocity.



Potential Energy

Examples: A large portion of this project is potential energy; the three weights and the pendulum. They are all strung high up and once they are pushed or the ground below them fall, the potential energy becomes kinetic energy.



Gravity

We used a few weights that used gravity but we also had ramps that used gravity to propel a marble forward.



Friction

Example:Friction is the resistance that one surface or object encounters when moving. This pulley helps eliminate friction some by spinning, therefore allowing the weight to go down and the ship to go up.



12 Steps

1. We drop the marble on a track and it falls into a funnel

- PVC
- Funnel- 37 cents
- Marble
- Screws



2. Marble triggers mouse trap

- Mouse trap
- Screws



3. Mouse trap pulls string and flips platform

- Parachord
- Wood
- Bolt



4. Platform releases a pendulum

- Twine
- Nuts and bolt
- Screw



5. Pendulum hits pivoting track and releases marble

- Marble
- Wood
- PVC
- Nail
- Screws



6. Marble rolls and hits a weight off of a track.

- Nuts
- Bolt
- Cardboard
- Pulley screws
- Twine



7. The weight pulls open a door and releases a marble.

- Box
- Cardboard
- Screws
- Popsicle stick
- Hot glue
- Marble



8. The marble hits a crowbar witch tips over.

- PVC
- Wrench
- Nail



9. Crowbar triggers mouse trap

- Screw
- Mouse trap- 10 cents



10. Mouse trap pulls string and flips platform down.

- Nail
- Screws
- Wood
- Bolt
- Parachord



11. Platform drops a weight and releases a rocket ship to mars through a pully.

- Pulley
- Twine
- 3D printed rocket ship
- Mars photo
- Screws





12: The ship will hit a weight that will eject a flag on mars.

- Twine
- Popsicle sticks
- Printed flag
- Big bolt
- Screws



Our Individual Reflections

Dan's Reflection

For this project the start was a hard challenge because we are all friends so it was hard to stay focused. As we got more into the project we got more concentrated instead of goofing off. I feel like we excelled after the initial phase because of our concentration. As we got through the project we learned to work as a team. This project was a ton of fun and I enjoyed doing it. I learned a lot and I gotta do it with friends. This project was a blast and I can't wait to do it again!

Israel's Reflection

I think that during this project I put into practice a lot of skills that I don't have a lot of practice in. For example I've practiced and improved a lot on considering the ideas of all of my teammates in the beginning. I had to focus and manage my time wisely which I did pretty well except for a few occasions in the beginning stages. As time progressed I continued to become more focused and learned to prioritize the steps over decoration and certain steps over others. On a few occasions our steps challenged us as we winged it for some portions of the building process. We would build ourselves into a corner because we wouldn't know what to do next or how to make it work. One such instance was the first mouse trap. We needed to make the mouse trap release a pendulum but we didn't know how the mouse trap would release a pendulum. I left and when I got back, my teammates had solved it through some trial and error. We also had a very successful step which was the pivoting marble track. This is because it was a specific piece that we had to work on in the shop and when we finally set it up right, it was a very clean step that made a very good addition. Practicing improvisation and prioritizing is especially important in any career. Also, in a work environment you will need to work with your coworkers and listen to them. This project was a good learning experience but also very fun.

Aiden's Reflection

Our project was very fun and teaching. I really enjoyed the building process before I broke my arm. Some things we could work on are communication and not yell at eachother. Some things we were successful on were getting work done which was tough because we are friends an like to mess around but we found a way to get it done and we finished early so we test rn it a bunch an fixed the things wrong with it. I loved this project and had a blast.

Word Count: 449

Original Day-By-Day Diary

https://docs.google.com/presentation/d/13QRHdK3kKJ7eeJLXq780noms_s1NUaZ rl4zy3oYZ9g8/edit?usp=sharing





Planned Machine Design and Description

A marble would fall through a funnel and hit a mouse trap witch would launch itself into the pendulum knocking it over then the pendulum would swing and hit a car that would fall into a cup witch is like a seesaw and it would push off a weight that would pull up a racket that would hit a button that turned on lights.



Final Machine Design and Description

Machine Steps

- 1. We drop a marble that rolls down into a funnel that lands it on a mouse trap.
- 2. That mouse trap goes off pulling the bar with a string attached to it.
- 3. The string pulls on a platform with a weight on it and makes it go vertical.
- 4. The platform going vertical drops the weight with a string attached to it acting like a pendulum swings and hits a platform.
- 5. That platform launches a marble.
- 6. That marble rolls down a track and knocks a weight off the track.
- 7. That weight pulls down a string.
- 8. That string pulls up a box lid.
- 9. That box lid releases a marble that rolls.
- 10. That marble hits a metal tool that falls over.
- 11. The tool falls over and hits a mouse trap.
- 12. That mouse trap pulls a platform that goes vertical.
- 13. The platform drops an astronaut.
- 14. That astronaut pulls up a rocket.

Cost of Machine

The cost of our machine was 57 cents because we used 2 mouse trap we bought and 1 funnel.

Percent of Recycled Material Used

Our machine is 85% recycled besides the astronaut we 3D printed, a rocket we 3D printed, two mousetrap, and a funnel.

Applied STEM Process

For how we applied STEM we used technology like mousetraps and pulleys. We used math to calculate things like the pendulum swing and the marble speed. We used engineering to make parts that we needed. We used science to 3D print our rocket and astronaut.

Reflection

For this project the start was a hard challenge because we are all friends so it was hard to stay focused. As we got more into the project we got more concentrated instead of goofing off. I feel like we excelled after the initial phase because of our concentration. As we got through the project we learned to work as a team. This project was a ton of fun and I enjoyed doing it. I learned a lot and I gotta do it with friends. This project was a blast and I can't wait to do it again!

Bibliography

https://www.amazon.com/ To buy things

January 17, 2023

To start the engineering project Ms. Jen came in and explained the engineering project to us. Then we got our groups our group was Izzy, Aiden, and Daniel. First, we looked at the rule book. After that we thought of names we wanted. After a long time we finally settled on the name Galaxy Geese because of the space theme.

1. Machine Dimorting	No more than 5' x 5'.
2. Number of Steps	Senior Division: 15 – 20 Steps Junior Division: 10 – 15 Steps
3. Steps Labeled	Each step must be labeled on the machine with a number and correspond with a written list of steps in Team Journal.
4. Advanced Components	Senior Division: • At least 1 Chemical Reaction Step • At Least 1 Electrical Step • At Least 1 Fluid Power Step • At Least 1 Mechanical Action Step
	Junior Division: Encouraged to incorporate Advanced Components, but not required.
5. Safety	Machines must be safe for all team members and observers. Refer to Advanced Components section for additional safety guidelines.
7. Flying Objects	All objects must stay within the parameters of the machine.
8. Run Time	No more than 2 minutes. There is no minimum Run Time.
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January 18, 2023

We started the day by thinking of unique steps we could use in our machine. Then we started making blueprints for part of our machine. We had an idea for the finale of are machine. We also thought of incorporating mouse traps into our machine.



January 19, 2023

Today, we used cardboard to make things. Our group decided to make a rocket ship. First we made the long part and the base. Next we made the tip of the rocket. Then we assembled it but didn't like the tip so we redid it. Then we put it back together with the new tip and we liked it so we kept it.









January 20, 2023

We watched a movie today about Apollo 13 for inspirations for our machine. The rocket at the end of our machine was inspired by the Apollo 13.



January 23, 2023

Today, we made an updated draft. We solidified some some steps and we added more to the ending. Then we made a list of materials we'll need for the project. After we finished by doing a lot of brainstorming for new steps and ideas.



January 24, 2023

Today, we learned a lot about pulleys and we worked on how we were going to make our pulleys system. We made this thing were it pulls up the rocket if the other string falls with a weighted objected on it.



January 25, 2023

At the start of the work period we made a trigger to the pulley. A marble will fall into a cup that is like a seesaw that knocks off a weight that pulls up are rocket.



January 26, 2023

Today, we started by ordering some of the materials we need for our project like a switch and some mouse traps. Then we tinkered with ideas for the rest of the of the day.



January 27, 2023

We reconstructed and evolved the end of our machine. We added this marble track and we brainstormed ideas.



January 30, 2023

We got palets and screwed them together. Then we brainstormed ideas for how we could get them through the door.



January 31, 2023

We put in a funnel on the side of our board so a marble can go through it and fall to another step.



February 6, 2023

Today we messed with mouse traps and thought how we could add it to our machine an idea we came up with was a marble would fall onto it and it would launch and knock something over.



February 7, 2023

We changed our mouse trap design so the mousetrap bar has a string attached to it that will pull something.



February 8, 2023

We tinker with the design and added a swivel platform that with be pulled by the mouse trap.



February 9, 2023

We now have it that the mousetrap string will pull a platform the will have the pendulum weight on it so it will fall and swing over.



February 13 - 17, 2023

We were gone on a school field trip in duluth and couldn't work.



February 28, 2023

Today we planned more steps and we added a a start to are machine.



March 2, 2023

Today we replaced our 3D printed pendulum with a nut we found because it's heavier. We added some new steps. The first step was the new pendulum hits a swivel platform that launches a marble that goes down a ramp where we while add in a new step.



March 3, 2023

Today we added the second part of the marble track and started messing with another pulley system.



March 6, 2023

Today we added a mechanism that will open a trap door to reveal an astronaut and release a marble. We started printing the astronaut.





Today we added more to the end of our machine and fixed a problem with our 2nd pulley.



Today we did a lot of journal stuff and tinkered with the step the connected to the rocket.