Space Ducks Journal

Materials

Cost Of Machine - 51.14$

94% :of our machine was recycled

Item	Cost	Item	Cost
⅜ Pipe 90	free	Radiator hose	free
Lights	Free	Hot wheels curve	Free
Pvc pipe half	Free	Medal ball bearing	Free
Hot glue	Free	3d printed cup	Free
Dominous	Free	String	Free
Grocery cart wheels	Free	3D printer Light switch	Free
Phone	Free	Medal rod	Free
Hot wheels long track	Free	3d printed hot wheel curve	Free
Peg board hooks	Free	Screws/Nails/Bolts/ Air Nails	Free
Peg board	Free	Pulleys	Free
Cars	Free	String	Free
Water balloons	Free	Lemon oil	Free
Funnel	Free	Brake line	Free
Tupperware	Free	Paint	Free
Dumping mechanism	Free	Wood - 1x4, 2x4, 1x6, plywood, furring strips	Free
CO2 Canister	$13.16	Clear pipe	$37.98
CO2 trigger	Free	Rocket	Free
Traffic cones	Free	Zip ies	Free

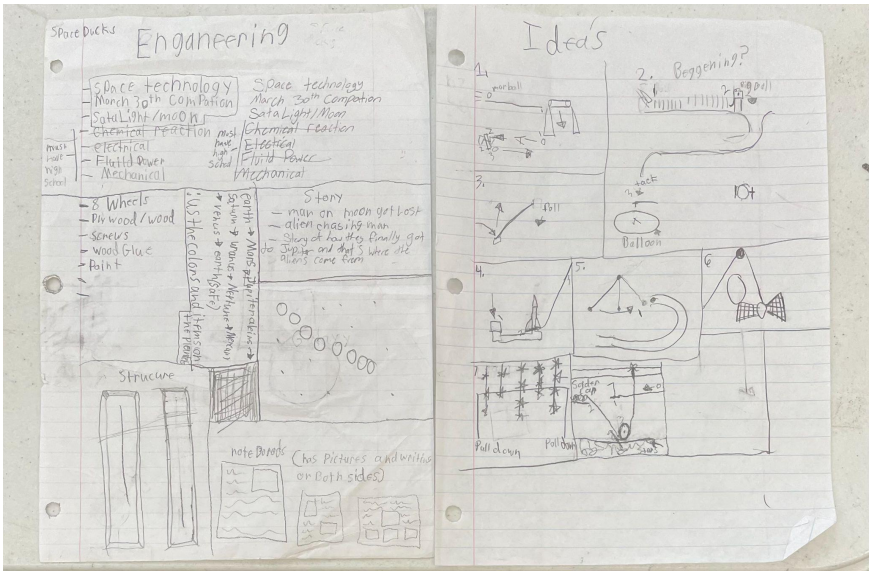
Solder less terminals	Free	Dowels	Free
5/16 Fuel injection line	free	⅜ NTP to 1-4 hose barb	Free

Machine Steps

(Advanced components)

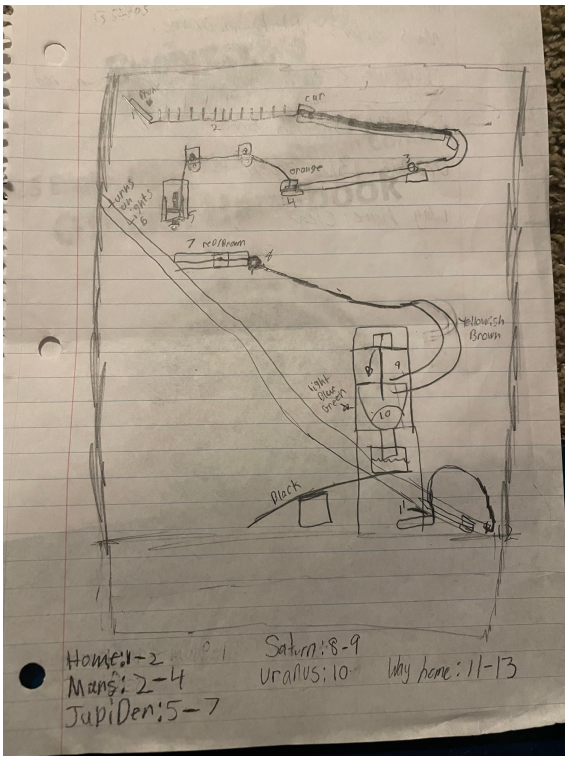
Number 1: starts by having someone call a phone that is laying on a slanted ramp
Number 2: the phone will slide down and push over dominos.
Number 3: That will fall and hit a car
Number 4: that will go down a long track and then hit a medal ball bearing.
Number 5: The ball bearing will then fall into a 3d printed cup
that is tethered to two pulleys that when the cup falls the pulleys will be used to turn on a light switch
Number 6 that turns on lights.
Number 7 Then the cup will hit a lever
Number 8 release a car that will collect speed as it goes down the ramp and curve into
Number 9 a cup full of citric acid dumped
Number 10 on a water balloon filled with water
Number 11 Then will pop and release the water into a tupperware that
Number 12 will weigh down a teeter totter with a CO2 trigger underneath that will be
Number 13 pushed setting off the CO2 shooting our rocket through the clear tube.

First Draft/Description



At first we did not have an idea for the base so we worked on steps to determine how the base should look.the page on the right is ideas for steps and what we might include in the machine. The page on the left are things we want are theme design and presentation to look/incorporate.

Final Draft



Final Image/Description

we incorporated the theme by using five different planets in the back of our notecards, adding two different constellations (the big dipper and hamal) lights as stars painting, a foreground, and a mountain range with a real mountain (Olympus Mons) on the back and left side of our machine. And the steps of our machine are really cool like we thought it would be cool to have a vibrating phone at the start of our machine because it is unique and nobody else will really have it. We also wanted to include a working light switch that actually works. Another thing we wanted to include was a chemical reaction so we found that citric acid pops a balloon due to the breakdown of the latex. We also used CO2 to move a rocket through a tube and nobody will really have CO2 in it either. And finally we have water in our machine and nobody else will really. use it in their machine because it could make a mess.

Reflection

Danica -So I really like this project. We did have our ups and downs but we always came together as a team. Like we things weren't working ary would make sure we all stayed calm and made a plan. But we didn't have too many times where we argued, we actually talked things out and made it work. Each of us had our strengths and weaknesses. I think mine were being good at building things and being able to pivot, but also, if I don't have something planned, I don't know what I'm doing and I like to be in control which isn't always the best because you have to let other people being control sometimes Ary and Collin they both know how to build a little bit. Ary is creative so she was very good at using different things. Collin was pretty good at building. I think Collin could've done a little bit better job of making sure if he doesn't feel including telling us, and then will include him. Ary and I mainly wrote the story together and that went very well so I think we did well on this project. We always have room to improve, and some of her challenges were finding the clear tube for the rocket, and after our machine broke, trying to pivot and fix it. I think theRegional competition went very well we worked very well together and we made sure to communicate so things don't get messed up or broken and we placed we got first place which I think we are all very proud of and we did unfortunately have to touch our machine once so we are making a checklist to fix that.

Collin - The engineering project went well in my opinion even though we had ups and downs. We watched videos to see other people's machines and get Ideas and see if we would like to incorporate a sum of them. We built the base and brought it to school and made a 3d printed cup for you in a pulley system. We put a ramp for a phone and a shelf for dominos to rest on and hung the poly. We tested it a little bit but then it got broken and when we tried to fix it it did not work anymore. So we scraped the poly and moved it to Danica's house to work on it so it doesn't get broken again. We worked on it over spring break and we got lots dun and we added cars and release mechanisms. We added a funnel to a dup thing for popping a balloon. We ordered co2 cartridges to move a rocket and got pipes for it to travel in. We got there early to unload it and test it to make sure that it worked. We hung around and looked at other peoples machines and watched other people test their machines. When it got close to are turn we set up the machine to be judged. On are first run we did not have to test it but one the second one we had to touch it one time. We then got something to eat and watched other people's machines run for the fun run. We sat down and watch the awards and we were really nervous because we did not here are names at first but we then won first place and were so happy.

Ary - This engineering project went really well. My team works really well together. We haven't fought about anything and talked to each other about steps so we didn't have a disagreement. Though sometimes we would get mad at how our steps wouldn't work, we would overcome that anger and together figure out how to fix the problem. There were some problems like finding a clear tube. It was also super hard coming back from having some of our machines broken because it took us a week and half. Other than that it's been really good and we get along with each other. We have worked at Danica's house 5 times to work on the project. If there is a problem we talk about it with each other and we take time to make sure that we all know what we're doing. For writing our story we talked about how to make it creative and then wrote it but after a month Danica came up with the idea to have our made up person dream instead of having it be real. I wrote the story and Danica made sure that everything was good and edited it. We also made a plan of what we were each going to say. We each have 2 things so we are very prepared.

Bibliography

Date accessed - January, 10

What we used from the video - This inspired us to do our first step with the phone.

https://www.youtube.com/watch?v=cv5WLLYo-fk

Date accessed - January 16

What we used from the video - This inspired us to use the pulley system.

https://www.youtube.com/watch?v=RBOqfLVCDv8

Date accessed - January, 21

What we used from the video - We found that citric acid pops balloons when stretched thinly

https://www.youtube.com/watch?v=Uox7u3wb5d8

Advanced component

Our advanced components include a 1 electrical component which is a working light switch. 2 mechanical components one is a lever and the other one is a pulley system. We also have 1 chemical component that is a water balloon that is full of water. We dump citric acid on the balloon and it pops.

Team Engineering Journal

STEM Process

January 5th: Mrs. Jen peck came into our classroom and did the intro to the project. We also did a little pre contest to see what we could do with things around our class room and it had to have 5 steps and we could not leave the classroom to get things.

January 9th: Today we made groups , went over the rule book and started making plans for our machine like the structure and other main components

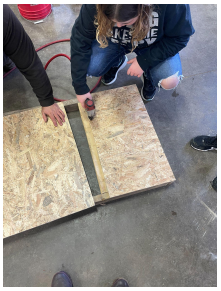
January 10th: Today we looked at ideas for steps and found two that we think we could use and also planned a day to build our base. Also we drew our first draft of what the base could look like.

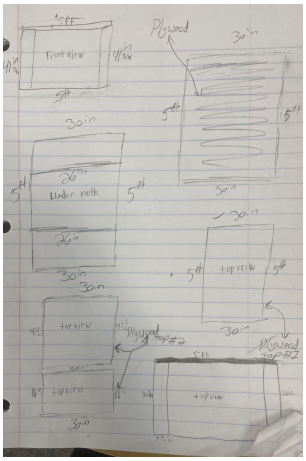
January 16th: Made a couple more plans for when we are building our base and other ideas. We also tested an idea and it worked.

January 17th: So at the beginning of class we learned about what a pendulum is. Then we made more plans for the 23rd. Also made a couple plans for the art aspect of our machine. And came up with a couple new ideas for a step.

January 20th: Today Ary was unfortunately gone so me and Collin came up with a couple other ideas for steps and started making our second draft before Monday when we started building our base.

January 23rd: So Monday morning everyone met at my house at 9:30 and we started to build. First we found wood that we could make a frame for the bottom 2 pieces and nail them together. Next we cut down our plywood with a table saw and used an air nailer to nail it down. Then we took a break to plan how we wanted the top to look and how we would assemble it. Then we started to build the sides and after we built both sides we went and tested an idea we had for a step . We wanted to see if lemon essential oils would pop a balloon because we wanted to use it as one of our steps. How it works the citric acid in the oil dissolves the hydrocarbons upon contact.



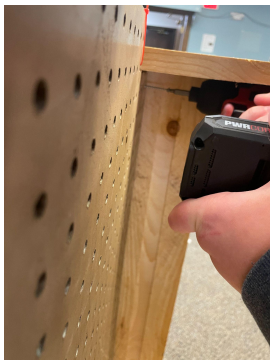


January 24th: Today we came up with a couple more ideas and made another draft

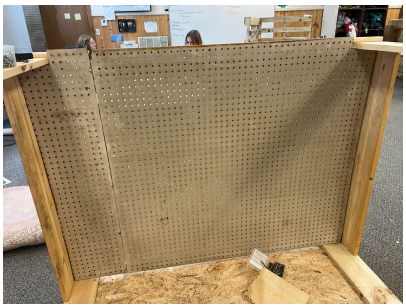
January 25th: Today we brought in our base to the classroom and made sure it fit through the door and all the measurements were right.

January 28th: Today we got the pegboard for the back of our machine. We cleaned it off and put a notch in it for the corner of our frame.

February 1st: today we screwed the right side of the peg board to the frames and braces and propped the corners up so nothing got bent



February 3rd: today we finished the right side of the peg board. We cut, drill, and screwed the peg board to the frame and braces



February 7th: today we put on our first three steps step 1 which holds danica's phone as it slides down and hits step 2

Step 2 which is a shelf for the dominos to hit step 3

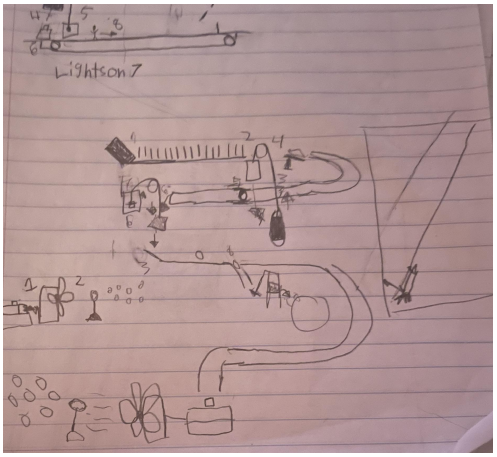
Step 3 is a pulley system that comes up when a domino falls in the cup

Step 1

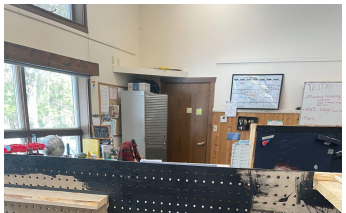
Step 2

Step 3

February 21st: today we put the wheels on the bottom of our base. It did take a lot of drilling and measuring but we got it done and it rolls.



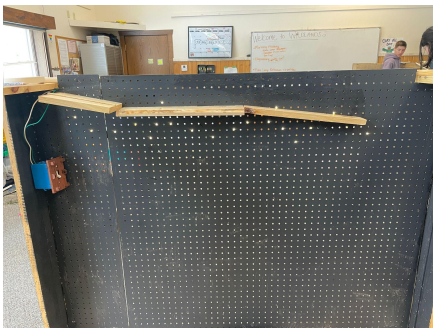
February 22nd: today we didn't have school so my group had a



zoom meeting and tried to plan the next steps in our machine.

February 24th: today we unfortunately had to fix our pulley and phone slide because it got broken.We were having troubles getting both to be consistent. So we scraped the pulley and now are getting a step to put it there. And for the phone slide we are waiting on a new piece of wood.

February 28th: today we started painting our background.



March 2nd: Today we finally got our new piece of wood for the phone slide and got that fixed. Once that was done we finished painting the background and put up the track for our next step which is a car. Then we also started putting up our stars (lights).

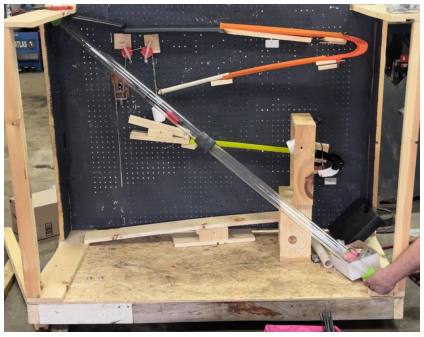
March 6th: today we didn't do much other than we tested to make sure our first few steps were consistent and fix what was not.

March 7th: today we loaded up our machine took it to Danica's house for spring break to work on it

March 12th: today we all met at danica's house and worked on the machine we accomplished adding on two tracks and a curve for the car. Then was the step that had a big marble so that it had a track. Along with a pulley and a working light switch.

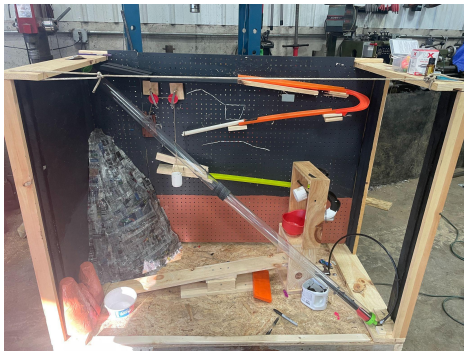
March 13th: today wasn't very eventful we mainly just cut down our rocket and made sure everything is consistent

March 14th: today was a good day because we built a lever and added two more tracks. Then we added on to a dumping mechanism from last year just to make it taller and made a teeter totter for our last steps.



March 22nd: today was our final day working on the machine. We mainly just did a full run through and now are just waiting on our CO2 because it's in the mail and so we are almost done. And now we are going to add a little more detail with the theme but other than that we are done.

March 24th: today was a boarding but eventful day today we finished final plans and worked on our presentation along with painting our base a little more.
March 26th and 27th: these two days mainly were to make sure the machine worked and looked awesome. We did a lot of improvements to the theme and design aspect by adding a volcano and painting asteroids and space ships to make it look nice.



March 29th: today was our final day at work. We made sure we had a fix it kit and we had everything we needed. we also loaded the machine and tied it done so it didn't move.

March 30th: This was our competition day. My team first got there around 7:30 and we helped Ms. Jen setup then we went off to set up our machine and get ready for the competition.th opening remarks started and we found out what time we would be going.

We tested our machine and watched other people go. Then it was our turn. Our presentation was pretty good. We do need to fix a few things in that before we go to finals. Plus our machine worked perfectly that first run. The second run we forgot to reset one spot so we have to make sure it doesn't happen again and when the judges were giving feedback they were having a hard time finding something wrong. After we finished presenting we got to be on the news 18 and got interviewed. And to make the day even better we won 1st place.