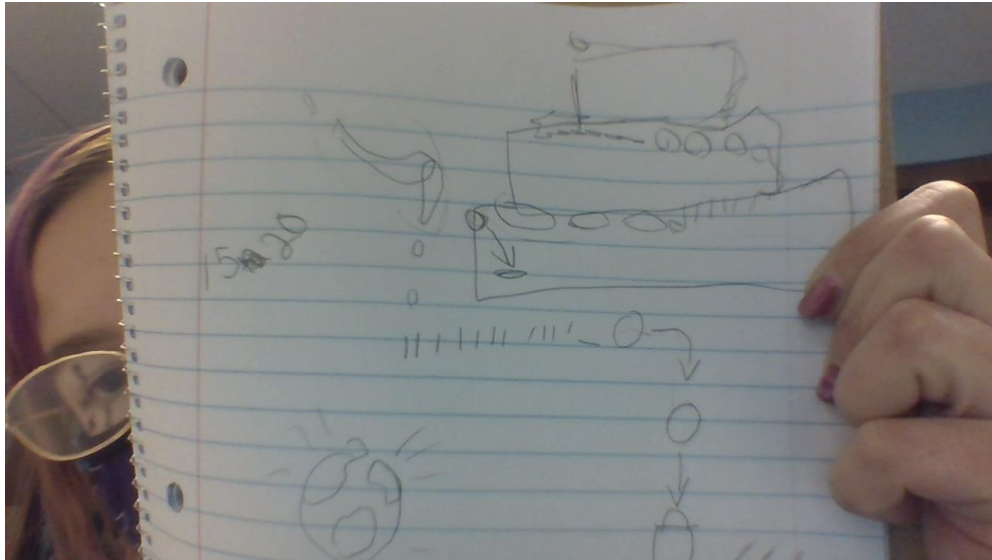
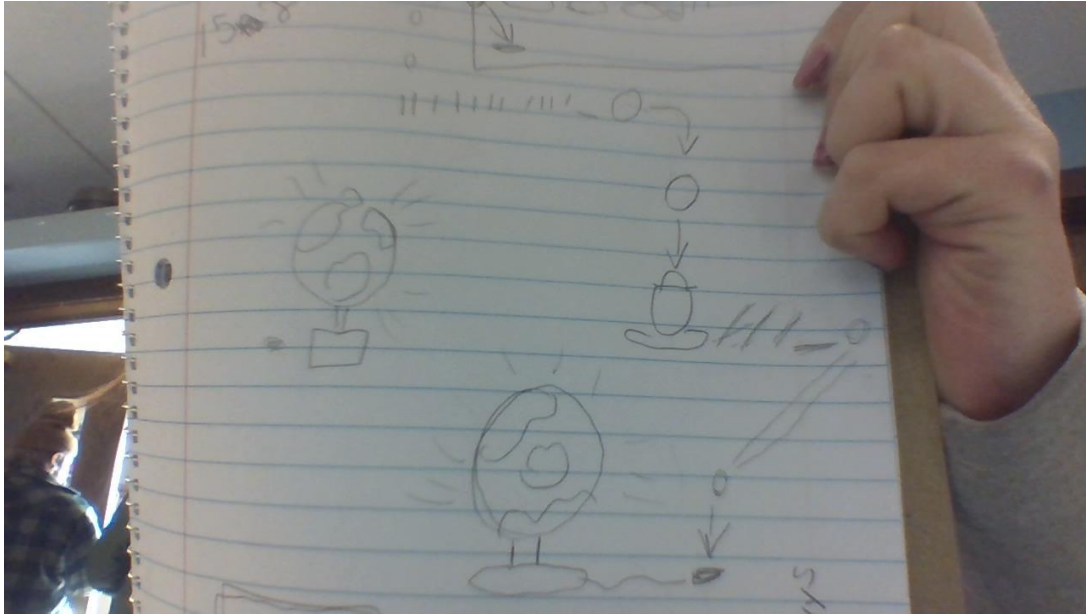


Jan 12, 2022

Our group is Ryan, me, Shay, and Charlie. We started our first meeting by reading the contest rules in the contest handbook. Our Rube Goldberg machine must fit in a 5-by-5 imaginary cube. It also must be 10-15 steps.

Our first idea was a marble that rolls around our structure and flips a button and powers a globe, but we decided to pick a different idea. Then, Shay had the idea of making our structure a pyramid structure, and having a marble roll down it, knock down dominoes, hit a toy car, toy car hits something, maybe more dominos, they hit something, and then it hits a button that powers the globe and turns on fairy lights.

We were not sure if we could do a pyramid, but we asked our teacher, Ms. Shcreoder, and she said we could do it. Shay said she had a bunch of stuff we could use for it.



Jan 17, 2022

It is our second meeting, and Shay and Charlie were not at school, so we video called Charlie, and Ryan suggested that for our machine, since we are making it a pyramid shape, that as it goes along, on each level it's a different part of the world. We also had to read in the handbook pages 3.6, 3.7, and 3.8. We also have to come up with a team name. I suggested the Pyramid scheme, and we decided to wait for Shay to come back before having Ms. Schreoder

put it on the sign up sheet. Ryan tried to video chat Shay, and while we waited Ryan read outloud the sections in the handbook. We decided on the team name Illuminati after a while. We then proceeded to figure out ideas for our machine.

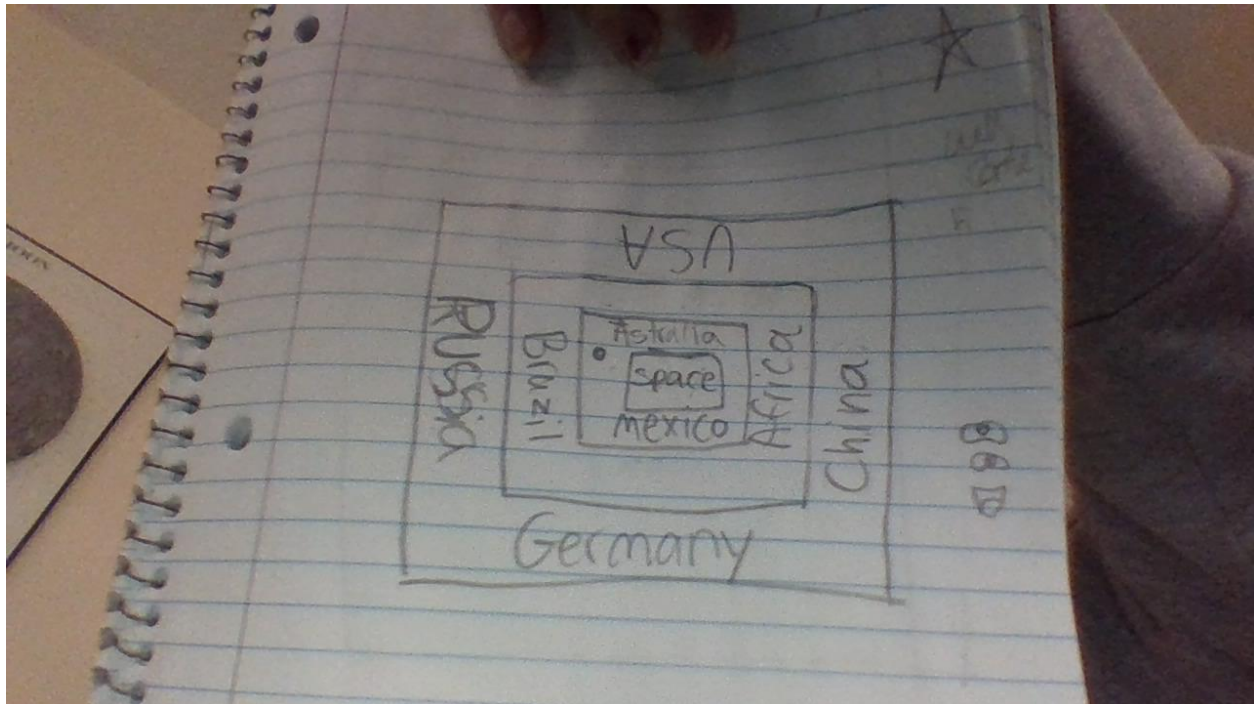
Me and Ryan drew an outline of our pyramid, and we figured out how much room we would have. We decided that the top of our pyramid would be one foot wide and one foot long. We drew our design idea, and what different design each floor of the pyramid would be. The bottom would be the ground with no light, and we would paint worms and on it, the second layer would be a town with a little light, the third layer would be a city with a lot of light, and the fourth would be the sky.

Ryan had the idea of making each layer into a different part of the world, like Japan, America, and Britain, so we decided to do that instead. I said we should keep the top of the sky. We decided to keep Japan, because it would probably have a lot of light. So, we decided to make each layer have a section, and in each section would be a different continent. The only thing we were worried about was finding material for each continent, since it was very specific. Ryan researched what Japan was famous for, and there were things like origami, and cat cafes. For the U.S., we figured Disney world, since that is a very popular attraction.

Jan 18, 2022

We started our meeting by explaining to Shay our idea about our project, and Shay was on board with it. Shay also said she has a lot of wood and stuff in her house we could use. We discussed different parts of the world, and which continents to use. We listed which continents we would like to do, and we decided to do South America. We decided to remove some of the ones we decided on if they didnt work. The ones we decided on now are Russia, China, Brazil, Australia, Mexico, Africa, Germany, and space. We spent most

of the time searching for facts and things these places are known for.



January 25 ,2022

So, we started another meeting by tinkering with things that Shay had brought. Also, Andrew Nimz joined our group. We asked Andrew if he had any ideas. Ryan wants to put in steps that are simple, but unique, that the judges had never seen before. Shay wanted a step that would have something go into a cup, knock something down, and pull on a pulley. She also had a toy dog that she thought of using it to walk into something to knock it over. Ryan created a document that we could put down things we could include in the project.

Feb 1, 2022

For this meeting, we took palettes out of the trailer. We had to figure out something with them for the pyramid design we wanted to

do. Also Charlie is back. So, after we got the palettes out of the trailer we drew a plan for it. We got a idea of what we want it to look like, and decided to bring things in tomorrow to experiment.



Feb 8 2022

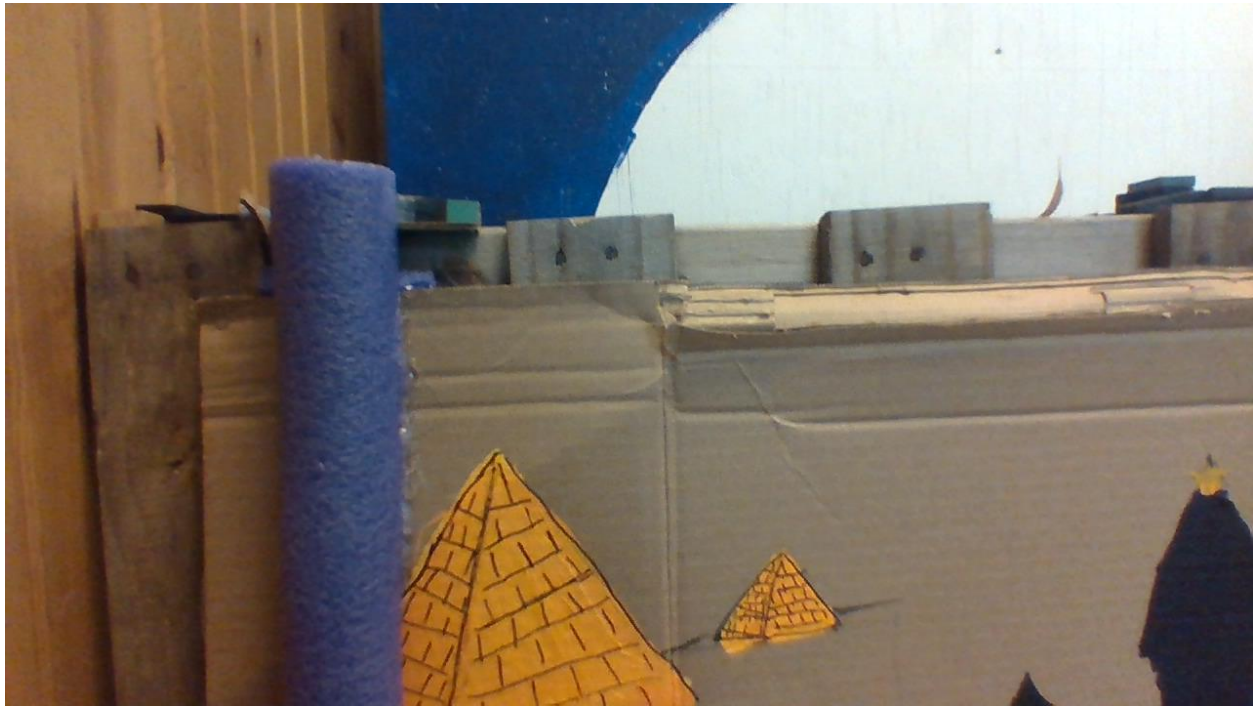
We started the design for the back today and started painting it. It looks really good! It has different paces on the bad such as, the pyramids for Africa, Moscow building for Russia, India's animals, temples for China, and the statue of liberty for the USA.

Feb 29 2022

We have started making our steps, and here's the main thing we came up with: We have Shay's newton cradle, so, for the first step, we pull the marble back and it swings and hits dominos. The dominos then run along the whole top of the palette. Then, they hit a marble, and the marble falls into a pool noodle, which is connected to part of a marble run, and it travels along the marble run, and hits more dominos which hit something else, but we don't know what yet. We all agreed that Charlie should help more though, because he did not do anything the whole time we were working. Also, when Shay was setting up the dominos, they fell before she finished. It was frustrating, but we all laughed.

Mar 7, 2022

Since we had a few steps down, we started on more steps. We decided to shorten the domino run so we didn't need to set up a bunch of dominos. While Shay and Ryan made another step with a pool noodle, and a race car track. I worked on positioning the marble and dominos so the dominos hit the marble just right, so it fell into the tunnel we made with a pool noodle. We have 5 steps so far, and we are currently working on coming up with ideas for the rest.





Mar 8, 2022

Today Shay was not here, so it was just me, Ryan, Charlie, and Andrew. We started by figuring out a different ending for our project since none of us had fairy lights. Ryan figured out a good idea. We used a snap circuit and used the light bulb part. I painted a ping pong ball to look like the earth, and we poked a hole in the bottom to connect to the light bulb.

April 1 through Apr 19, 2022

After the competition we started to fundraise, then we worked on the background art. To start we added sand to the pyramids, got rid of Russia, replaced it with Big Ben, added trees and a waterfall to India, changed China, added a flag to the USA and changed the final two steps.

Team reflections

Maddy

I think that our Rube Goldberg machine turned out pretty well. We definitely could have used more time for it, but we made use of the time and materials we had. It was hard to come up with ideas for steps, and some people didn't help that much. We could have probably gotten more steps if everyone had helped more, we probably could have gotten it done faster, and gotten more creative. Overall, our project could have been better, but it's ok.

Ryan

I think our machine was good. I think we could have done more and been more creative with our space. For us it was hard to think of more steps. I think in the end we did ok.

Charlie

At first the project was awesome, but this required a different system than I'm used to. The system we used was planning and researching. When I made a rube goldberg machine I just went for it without any planning and then it turned out awesome. Overall rating 4/10

Andrew

I was not sure about this project at first but It was a cool experience. It was a lot of work planning and teamwork and had changes and challenges along the way. With our friendship and problem solving skills we manage to get through it and endup with an amazing project.

Shay

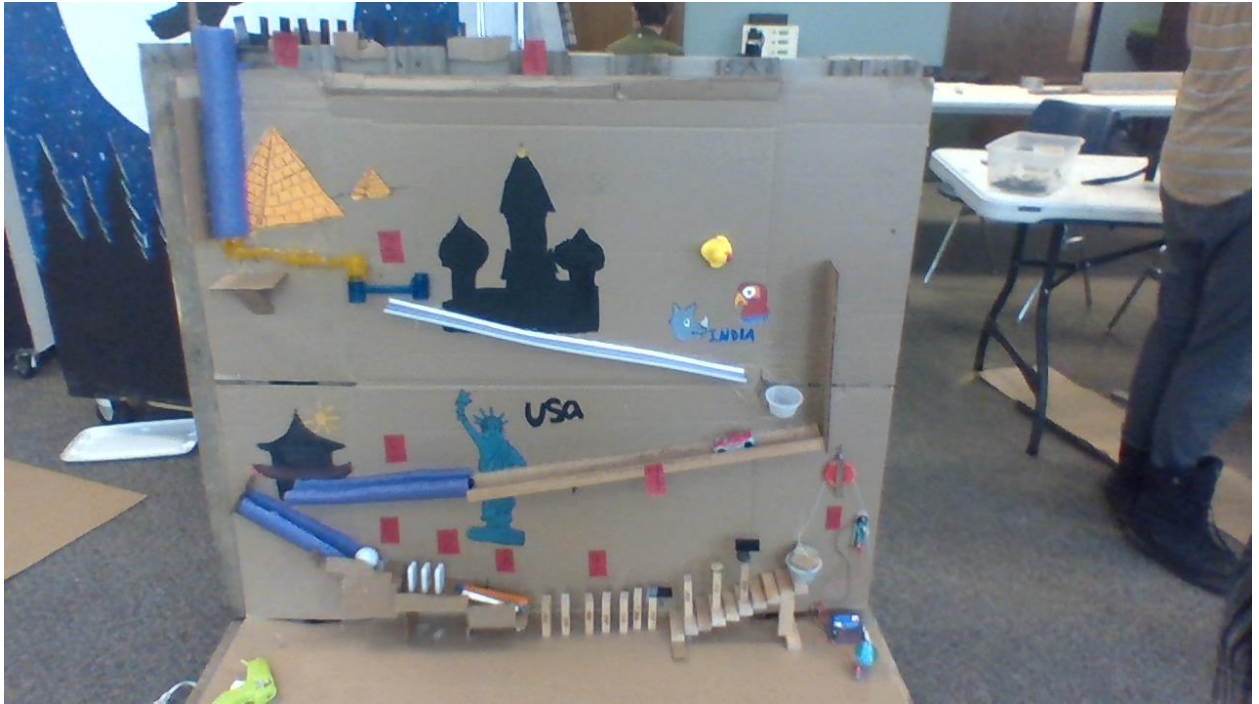
I think this was a super fun experience and I would love to do this again. I think our group's biggest issue was Participation but besides that, I really enjoyed listening to my teammates' ideas and seeing them unfold into our project. Overall I'd give our Machine a 7/10. I'm proud of it.





Ending design and description

Our Rube Goldberg machine starts with a Newton's cradle. To start, we pull one of them back and let go. It then hits a domino, causing a line of dominoes to topple over. The dominoes then hit a marble on the end of the line (these two steps are on top of the pallet which is a wall of our machine.), then, the marble falls down a cut-in-half pool noodle, onto part of a marble run. Then, it falls down the marble run, onto part of a hot wheels track. Next, it falls into a cup with a hole in it, and onto a track thingy, hitting a hot wheels car. The hot wheels car falls down the track, and hits a marble. The marble falls down more cut-in-half pool noodles, and hits a ping-pong ball. The ping pong ball hits dominoes. The dominoes hit a marble. the marble rolls down a track and hits a jenga block. The jenga blocks topple in a line and then hit more jenga blocks which are on top of a staircase made of jenga blocks, which then hit a ping pong ball colored like the earth filled with rocks. The jenga blocks push it off, and since it's attached to a switch it turns on fairy lights placed around our machine.



List of steps

1. Newton's cradle. The start of the machine begins by one of us pulling back one of the strands on Newton's cradle.
2. Dominoes. The second step is a line of dominoes, which starts to topple when we let go of Newton's cradle.
3. Marble. The dominoes hit a marble on the end of the top of the pallets which make up our base. The marble falls down a pool noodle and through part of a marble run and race track, and falls into a cup with a hole in it.
4. Race car. After the marble falls into the cup, it falls through the hole and hits a race car, causing the race car to zoom down a wooden track.
5. Marble. After the race car finishes going down the track, it hits a marble and stops. The marble falls down two pool noodles in a zig-zag direction.

6. Ping pong ball. The marble hits a ping pong ball, causing it to fall down a cardboard step.
7. Dominos. The ping pong ball hits a few dominos in a line, causing them to topple.
8. Marble. The dominos hit a marble at the end of the line, causing it to fall down a short distance of track.
9. Jenga blocks. The marble hits a bunch of jenga blocks going up steps, causing them to fall like dominos.
10. Earth ping-pong ball. The jenga blocks hit a ping-pong ball painted like the earth, and it falls, pulling a switch making the fairy lights light up.

Successes and challenges

The first success we had was putting the base together. It was difficult putting it together and carrying the pallets out of the trailer, because they were really heavy! The first challenge was thinking of ideas for steps. The whole time, we had problems thinking of them. The second challenge was actually building the steps. We didn't start out with a lot of materials, so we didn't have a lot of inspiration. Once we got building, our second success was the satisfaction of seeing our first steps actually work. The third success was getting the domino step to work! Since I was in charge of the dominos, it was especially frustrating for me to see the dominos I put up collapse multiple times in the process of putting them up. The third success was

seeing our machine finally work! We tested it multiple times, and when it finally worked, we were so happy!

The third challenge was getting it all put together. It was hard to get everything perfect and working.

List of costs and recycled materials

Recycled: 99 percent

Total cost: \$18. \$6 dollars per fairy light strand.