



Our Theme







Original Design



For our original design are steps were:

- 1. Blow pump blows air through straws to push marble.
- 2. Marble goes around a fake Saturn's rings.
- 3. It hits dominoes that start a chain reaction.
- 4. It knocks washers off a table and pulls a string in a pulley.
- 5. The string is attached to a balloon full of baking soda to let it fall into vinegar, starting a reaction.
- 6. The balloon fills up and triggers a mousetrap.
- 7. The trap snaps, which releases a ball wrapped around a tetherball pole.
- 8. The ball wraps around and hits a matchbox car.
 - 9. The car rolls down a ramp and hits more dominoes.
 - 10. A weight falls and hits a pump rocket base.
 - 11. The rocket goes up, ending the project.



OUR STORY

A space company is sending a new rocket into space. There design to get the rocket propelled is flawed though! The top scientists are called to find a way to help it get into the air. They plan for months and create a complicated but smart way to help. Hopefully the process works and the rocket can be in space!



Meet Team Liftoff

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- Ping pong ball
- Metal washers
- Yarn
- Marble track
- Shoe box
- Cardboard ramp
- Balloons
- Vinegar
- Baking soda
- Dominoes
- String
- Wooden plank
- Bottle Rocket

Material List

- Dominoes
- Styrofoam
- Таре
- Ribbon
- Ribbon spool
- Marble
- Screw
- Plastic reusable water bottle
- Wooden stick

Money Used

- OSB pallets \$ 12.62
- Star-coating spray paint \$6.32
- Normal black paint \$10.50
- Painting set \$3.48

Actions



Action 1!

We began our project with flicking a lever on the top of a marble playtrack. A marble is released and begins going down a tower of loops and really shows the forces of gravity. We made a third side of the track so it wouldn't fall over. Once the marble finishes going down the track, it falls out of the bottom onto an inclined plane.

- Marble play run
- Shoe box
- Tape



Action 2!

The marble will fall out of the end of the tower and hit a inclined plane. Therefore rolling down to hit the next step dominoes.

- Shoebox
- Tape
- Styrofoam
- Cardboard Inclined Plane



Action 3!

The dominoes are triggered by the marble and hits a washer triggering the next step.

- Dominoes
- Marble



Action 4!

As the dominos hit the washers off the wood, a string attached to the washers uses a string mechanism to swing the watchers over to trigger the next step.

- Washers
- Ribbon
- Ribbon Spool
- Shoe box
- Tape



Action 5!

Then, the string uses the force of gravity and acceleration to propel itself to hit another set of dominos.

- Washers
- Ribbon
- Ribbon Spool
- Shoe box
- Tape





Action 6!

When the chain reaction with dominos happen, they hit washers connected (With a ribbon) to a pulley system

- Washers
- Ribbon
- Ribbon Spool
- Shoe box
- Tape



Action 7!

The ribbon that is attached to the box is attached to the pulley system pulling the box lid up.

- Box
- Everything part of the pulley system



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Action 8!

The balloon, Using the carbon dioxide, expands in a box and the box's lid is lifted from the balloon filling up and starts to tip a ramp.

- Box
- Hotwheels car
- Hotwheels track
- Tape
- Balloon



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Action 9!

The car goes down the box on a ramp to activate the next step.

- Hotwheels car
- Wood pole
- Box
- Hotwheels track



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Action 10!

The box has a stick holding it up and it and closed the box to activate the next step.

- Car
- Box
- Wooden stick



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Action 11!

The closed box pulls a string to activate a weight made out of dominoes.

- String
- Box
- Tape
- dominoes



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Action 12!

Once the string is pulled, dominoes tip off a plank of wood and pull up a bottle rocket, thus launching it and completing the machine.

- Wooden Plank
- Dominoes
- Bottle Rocket
- String
- Tape



Final Design (or close to final)

It wasn't all put together but it is the basic idea.



DAYS 1-4

We played some mind games to determine what the teams would be and who would get the most done and try the hardest, on day 4 we got our teams.



DAYS 5-11

Our team began to brainstorm what our project should be about and what our all-around theme should be. We agreed that i should be about launching a rocket into space. We drew our original design too.



DAYS 12-24

We started creating our design, a few of us brought in ingredients for our machine, including dominoes and the marble track. (We did away with our straw and blow pump idea for it.) We got the first couple steps to work on. It was partly hard because of the lack of supplies have.



DAYS 25-38

We changed rooms from our classroom to an empty one to one a few doors down! We made a pulley system with washers to fall off and we brought in the bottle and the ingredients required to make the reaction to fill it up. It got somewhat messy but we finally got it working and started thinking what to do after that.



DAYS 39-69

During these days we were making boards and perfecting steps. Also we made many new steps that failed and worked. We opted for updated versions of our first steps.





DAYS 70- End of Trimester

We kept on, and we didn't end up finishing it at the end. Since the trimester ended, we worked on it after school. One of our members drilled the boards together. We got the rest of our steps done and finally finished the creation.



STEM Processes

- 1. Th pulley system is a way of engineering in use, the way in one falling and one lifting shows real trying with thespool we used.
- 2. The marble track is considered as technology because we built it in a unique way to move our marble.
- 3. The washers swinging back and forth is an example of science with the forces of gravity acting upon it.
- 4. The dominoes falling is an example of science and a chain reaction causing the dominoes to fall over,

Reflection

We learned a lot over the course of the time we did this project. We had the opportunity to do this amazing project. We had a engineer to come in and talk to us. He was a very good speaker and helped us brainstorm. He and a group of other engineers created Lite Run which is a machine to help people walk and is used in some hospitals in Minnesota and becoming more popular. It was tough and took many tries to perfect and not even perfect it but make it work and look nice. We all had to work together and stay after school a few days to work. And we were very rushed because a few days before the competition because we wanted to make everything look "better". Although we had barely got it done, there was still a lot of challenges along the way. The major problem that we had was that when we started the project we started to build it on the floor. So, when we had the platform, we faced a problem that was. How could have we engineer this to have some of these steps change.

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