1/11/22  

began building the frame. 4x4x4x

unsure
if the 3rd right side is going to be inserted.

placed 2x4 to support 4 ft.

without the 2x4 the sides wouldnt be stable and would fall over.

1/11/22 (entry 2)  

right->  
left
back

used 2 1/2 inch screws to make the frame.

2 more 2x4's to support the sides.
1/12/22 (entry 1/1)

- Ran into the problem of the sides not being stable enough.
- Took 2 hours to solve.

To stabilize the frame, added 2x4s as 2x4s on top connecting corners to increase stability.

* Did not add the right side.

1/13/22 (entry 1/1)

Added boards to screw boards into place.
1/18/22 - 

Began building the steps. Water wheel in the making. Marbles will hit dominoes.

1/25/22 - 

Added the next step to the project. *Obadiah & Sam are both gone. *On Hiatus.
2/7/22

The team is back

- top support removed (wasn't stable)

- side support added (to increase support)

2/8/22

Water wheel complete (not free spinning)
*adding final steps to the projects initial design.

2/11/22

2/15/22
going back to redo previous steps

2/20/22

removed funnel & water wheel platforms for ball to fall down
3/1/22
- removed everything from boards
- began painting board blue color for the sky
* while mixing spilled a large amount of paint on the floor

3/2/22
- finished painting walls and added aesthetics.

3/4/22
- rebuilt and added all steps to the project (that were previously completed)

3/9/22
- revised steps that were flawed

3/12/22 (entry 1)
- began working on presentation

3/12/22 (entry 2)
- working on final steps of project
- wanting to do baking soda & vinegar reaction using syringe
- thought that bowling pin falling on syringe would work
3/14/22
-
revised final step

- baseball falls on a plate to push down the syringe
  - need fuel line for hydraulics

3/17/22

- got fuel line
  - first bottle used wasn't sturdy so it was switched out
  - bottle wouldn't stay in the right place
3/13/22
- finally began working on final step
- top-down view
- marble hits a backboard and bounces back to hit the cup
- inside the cup is a ball which rolls down a toke to hit a baseball
- final step didn't work
- after second last step

3/7/22 (forgot this)
1. Dominoes get pushed over releasing marbles.
2. Marbles fall down a ramp to a drop.
3. After the drop, marbles fall through blocks of wood.
4. Marbles hit over a set of dominoes
5. Dominoes knock over golf ball
6. Golf ball goes into cup, pulling string.
7. String pulls up crop releasing marbles falling down a ramp hitting crop
8. Crop knocks over a crop releasing a golf ball
9. Golf ball falls down a ramp to dislodge a baseball
10. Baseball falls onto a plate pushing down a syringe
11. Syringe releases vinegar through a fuel line into a cup of baking soda
Final design (extended after the first competition)

12. Balloon inflates to transfer its energy into the Hot Wheels car which rolls down the Hot Wheels track.

13. Hot Wheels car pushes down a switch releasing the stored energy of batteries that are kept hidden in order to turn on lights.
Major successes and challenges

All work and supplies were kept in a small 15x25 ft area in the back of a church

Large problems on the final step of the machine.
   Took several hours of brainstorming and testing to find a solution

Restricted use of powertools, only had 2 drills, and 2 saws

Several total hours of arguing over the entire duration of building the machine

Had limited amounts of paint and nearly ran out of paints while painting

Many distractions were encountered while building the machine

Had trouble setting up wires and connecting them to the batteries
4/11 continuing to add steps and new components to the project

4/12

4/12 painted houses

4/13 completed design

4/19 worked on journal
Lumber:
   2x4=$496.00
   4x4 ½ = $226.00
   Lumber total price $695.00

Screws:
   1 1/2"=$10.40
   1 1/4"=$11.40
   Screw total price $21.80

Paint:
   Yellow paint=$22.95
   Blue paint=$22.95
   Red paint=$22.95
   Paint total price $68.85

Cotton balls:
   White cotton balls=$4.98
   Cotton ball total cost $4.98

Miscellaneous stuff and recycled materials:
   cups=$3.99
   Popsicles stick=$3.00
   dominos=$3.00
   Hot glue=$5.00
   Random wood=$10.00
   string=$.50
   Pulley=$.30
   styrofoam=$1.00
   Vinyl tubing=$2.00
   Glue/adhesives/puddys=$15.00

12% of materials were recycled without including donated recycled wood.
23% of materials were recycled if you include donated wood.
1. Ball falls down pulling a string.
2. String pulls a cup over with a golf ball inside.
3. Ball hits a water wheel and goes through a funnel and hits dominoes.
4. Dominoes fall over and onto a downward angled board and into a cup.
5. Cup falls down pulling the string of a pulley.
6. String pulls up a cup which releases marbles.
7. Marble falls down a slanted board onto a seesaw.
8. Seesaw releases a ball which goes down a ramp.
9. Ball hits a chunk of "plutonium" which knocks it into a "nuclear reactor."
1. First image taken on January 24th, 2022
   First image ever taken on the machine, little to no work was done we just
   have finished building the frame and making the first few steps

2. Second image taken on February 28th, 2022
   Some changes done to the machine
   removed top support from frame
   Added side supports, to increase the stability
   Added steps to the machine
   Revised steps that were flawed

3. Third image taken March 10th, 2022
   Painted walls with a mixture of white and dark blue
   Added multiple more steps
   Increased aesthetic aspect

4. Fourth image taken March 22, 2022
   Near final design (final design before preliminary round)
   Completed aesthetics, and looks to the machine
   Completed final steps that we had trouble with

5. Final image taken April 19th, 2022
   Steps were added after first competition
   Hot wheels and lights added
   Increased number of steps by 2

Advanced components used

1. Chemical reaction, in step #11 of our machine a syringe is used to push vinegar
   into a cop of baking soda, creating Carbon Dioxide CO₂, water H₂O, and sodium
   acetate C₂H₃NaO₂

2. Electrical components, Power switches, batteries, light bulbs, and wires were all
   used in step # 13

3. Mechanical components, step number 6 includes a pulley system to transfer
   energy from one side of our machine to the other.

4. Fluid power components, hydraulics were used in step 13 of our machine to push
   vinegar into the cup of baking soda.
Individual reflections

Daniel:
My name is Daniel Rongner, I had fun building and working on this machine. While building I learned many new things, such as the correct ratio of vinegar to baking soda needed to make an efficient reaction, 1 part baking soda to 2 parts vinegar. This machine really challenged my teamwork skills and helped me solve problems that I had not faced before. One of the first challenges that we faced really had me thinking of ways to solve it. I had to make a solution that not only worked but also looked good.

Obadiah:
Hello, my name is Obadiah Weideman. I was one of the main engineers of our group, together with Sam. I had fun on this project and made the bonds with my friends stronger. The project helped me get better at cutting with a handsaw and progressing with my engineering skills. The largest problem that I encountered was in our last step where we had to mix vinegar and baking soda in a reaction, it took me over an hour of thinking to fix the problem. My personal opinion is that we all did very well working together working on the machine, doing our very best to get everything working perfectly and done quickly.

Oliver:
For the project I was the artist and helped make the theme and design. Through our machine we redesigned steps and used the stem prouses many times. And I learned how to work together and work with wood and equipment used for the project. My job that I want to do is managing my family business and that needs skills in handy work, and this project helps me advance those skills that I need.

Sam:
Hi, I am Sam and I was one of the engineers and a small piece of the design team. During this project I learned that I like to work with my hands and how much time and work go into these projects. I think I might like to go into construction or concrete which I do in the summer. With these projects its a love heat relationship some time we like getting out of class to work other times we didn't even want to look at them but in all good spirits it was a good fun project and I would do this again.