

Brainstorming 3/10/23



Theme - Power the World!

End Product -

Steps -

1. End

2.

3.

4.

5.

6.

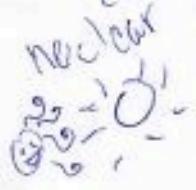
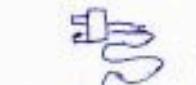
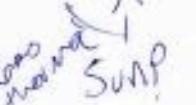
7.

8.

9.

10. tube + ball

(Backwards design process)



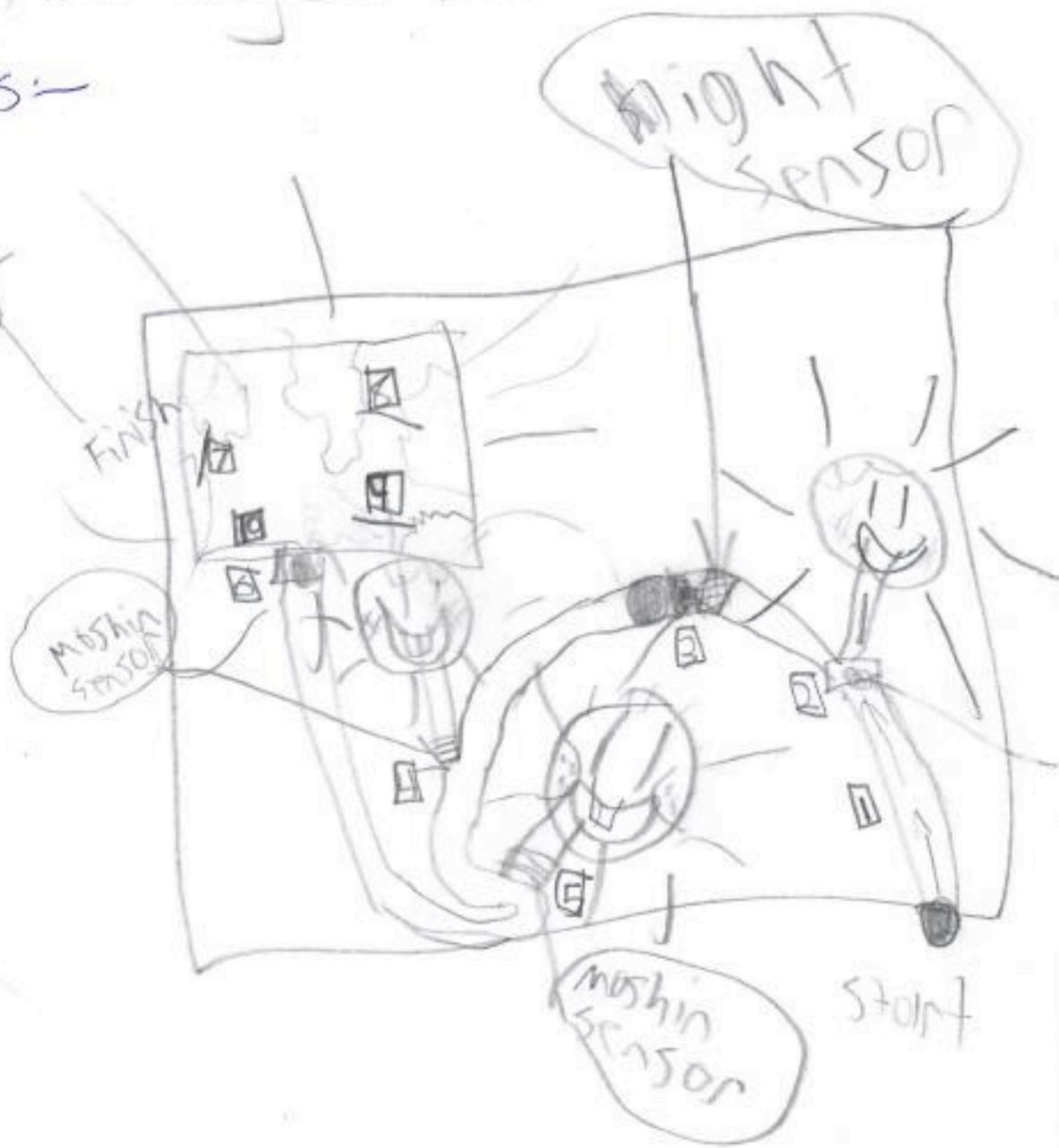
Light up ^{the map} over the Earth

Brainstorming 3/10/22

Materials:-

lights

smiles

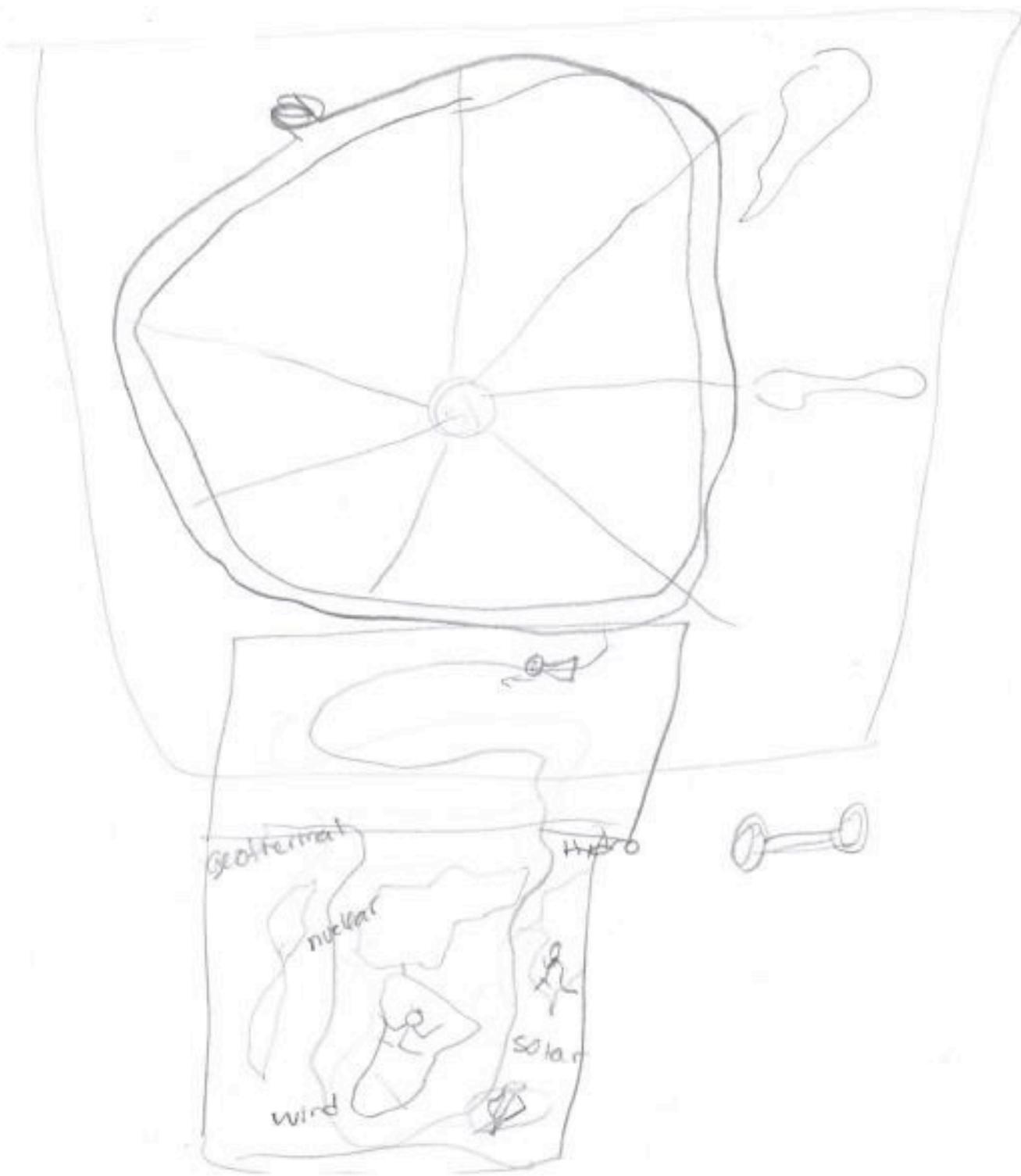


Superhero

Brainstorming 3/10/22



Brainstorming 3/11/22



Brainstorming



ugly up me

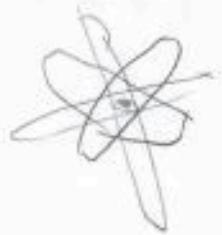


Do: 3/19/22

Marble

run +

Dam



March 23
2022

| Amelia | Dominic | Davian |
|---------|-----------------------------|---|
| Sun | Dominoes Step | Trial power Plant + Waterwheel Placement |
| Houses | Step | |
| Mascles | Waterwheel arm | beautify Power plant |

Don't Forget to...

strap Mouse trap
DOWN!

our chemical step ~ STEM process

~~My~~ Volcano mixture

trial: 1

start:

1 Tbs baking soda
1 Tbs dish soap
2 Tbs water
1/2 cup vinegar

2 things: good volcano flow
through the tube

Conclusion: Needs more water to go through the tube.

Trial 2:

1 Tbs baking soda
1/2 Tbs soap
3 Tbs water
1 cup vinegar

Observation = no water, lots bubbles
but took a long time.

Conclusion: Speed up reaction change
tube to allow bubble mixture to go through

Trial 3:

Released tube, so straight

3 Tbs H₂O

1/2 Tbs soap

1 cup vinegar

1 Tbs baking soda

Observation: initially about 1 Tbs liquid through tube. Then volcano continued erupting.

Conclusion: secure the tube
more vinegar less H₂O, should give
quicker initial reaction

Trial 4:

1 cup vinegar
1/2 Tbs soap
1 Tbs baking soda

Observations:

Reaction made nice volcano
but not through tube.

Conclusion: Need a bigger tube
diameter

Trial 5

1 cup vinegar

1/2 Tsp Soys

1 Tsp Baking Soda

Observations:

Ran through tube

Conclusion: See if this will work
with the water wheel.

5 steps for the final project

1. Marble Run: triggers mechanical
2. Hoover Dam: mechanical step - latch
3. wind mill: *wind power: Triggers chemical step
4. power plant: *nuclear power: chemical step
5. wedge: Diverts overflow from power plant
6. water wheel: *Hydro power step
7. Dominos: triggers mouse trap
8. mouse trap: releases weight
9. weight: triggers Electrical step
10. Electrical: Turns on lights and Sun
11. Sun and houses: *Solar power

* forms of renewable Energy that we used in our project

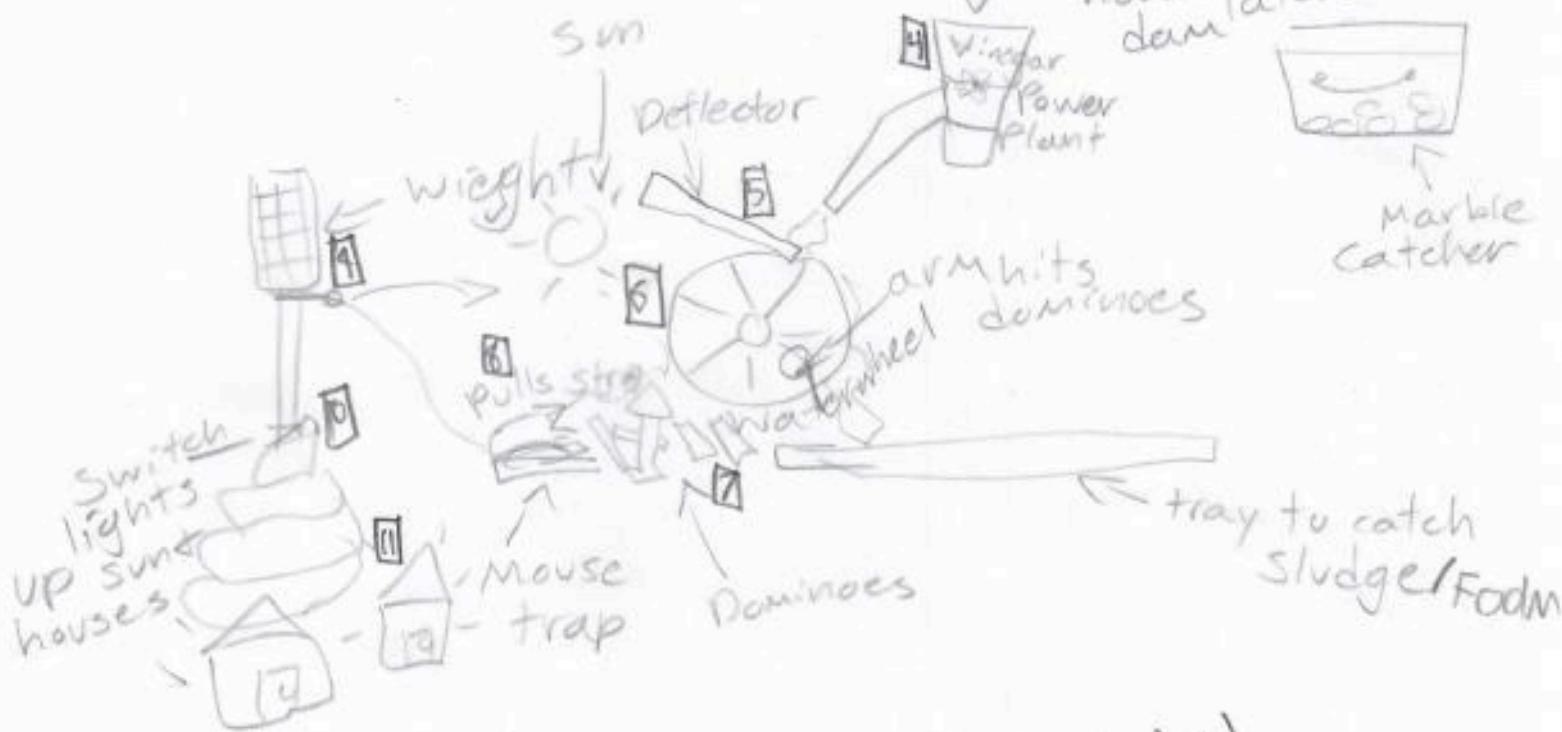
3/25/12

Final Product (what we made)

marble
track

All 11 steps

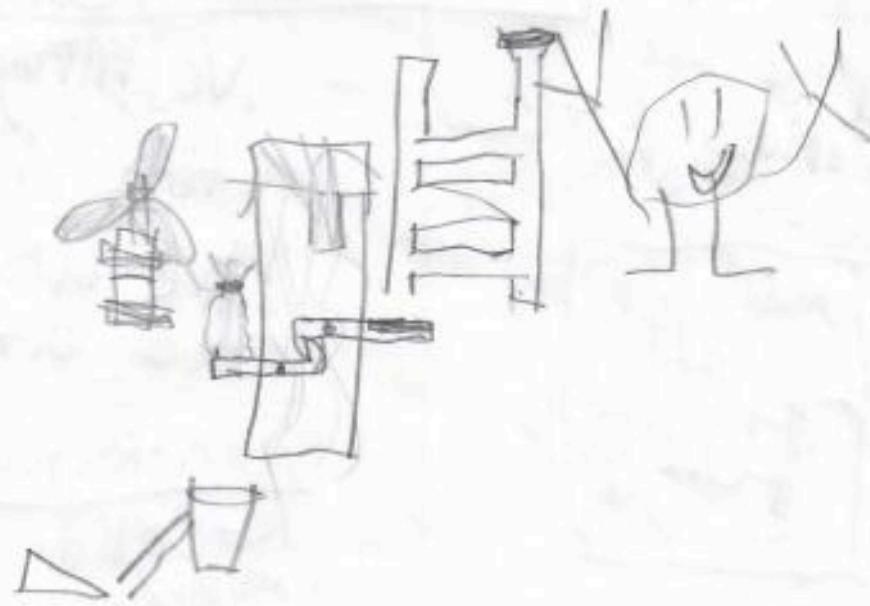
Note: still needs
to be made
pretty.



~~* Find~~ Final
~~there!~~ Power the
WORLD using
renewable Energy!
Note:
Nuclear is
NOT Renew-
able Energy,
but clean
and Effec~~tive~~.

Notice

~~Notice~~



Notice
① all of the
materials
were on hand.

Machine
cost:
\$0.00,
zero dollars.

Note:
we all
ready had
the peg board.

Fraction
 $\frac{1}{4}$
0.25
Decimal
Percent is $\frac{x}{100}$

4/18/22

Itemization/Calculations

Nothing was purchased
for this machine.
We used what we
had at home.

Non-Recycled

Peg Board.
Marble/
Ran. y_2
Windmill.
Paint. Dominoes.
Electrecal.
LEDs.
Glob.

Recycled

Mdr Blc
catcher.
Hoover Ddm
10th ch.
 y_2 windmill.
Funnel, foam
cheess. wedge.
water wedL.
mouse trap. Logos.
Houses. sim.
Decorations.

Total = Glob arms.
24 items used

$$\frac{15}{24} = 0.625 \times 100 = 62.5\%$$

Fraction decimal percent

Note!
62.5
Percent of the
machine is
Recycled.

$$\begin{array}{r} 24 \\ - 9 \\ \hline 15 \end{array}$$

Problems & successes.

Problem

Marbles flew all over.

successes

Containers to catch them

The vinegar didn't hit the waterwheel.

The wedge helped dump the vinegar on.

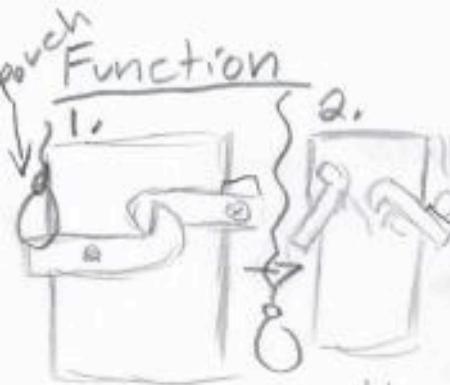
The blob of baking soda the funnel we put there didn't fall in the cup. Helped guide the blob in.

The peg board kept tipping over.

We put supports there to stop it.

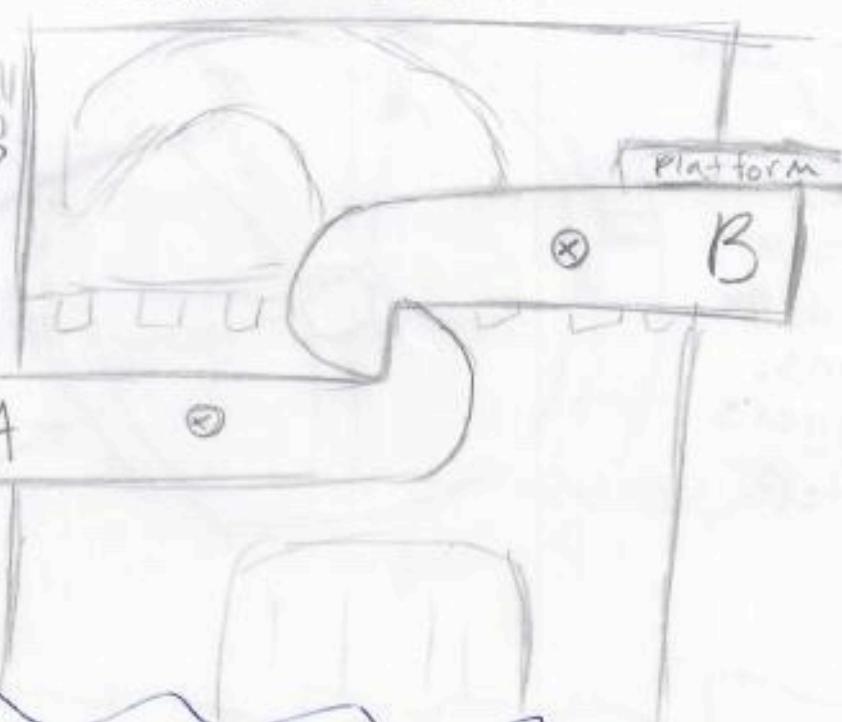
4/18/22

Mechanical Step



when a Marble falls on Platform and That releases the lever that holds a Pouch. Pouch falls.

Hoover Dam

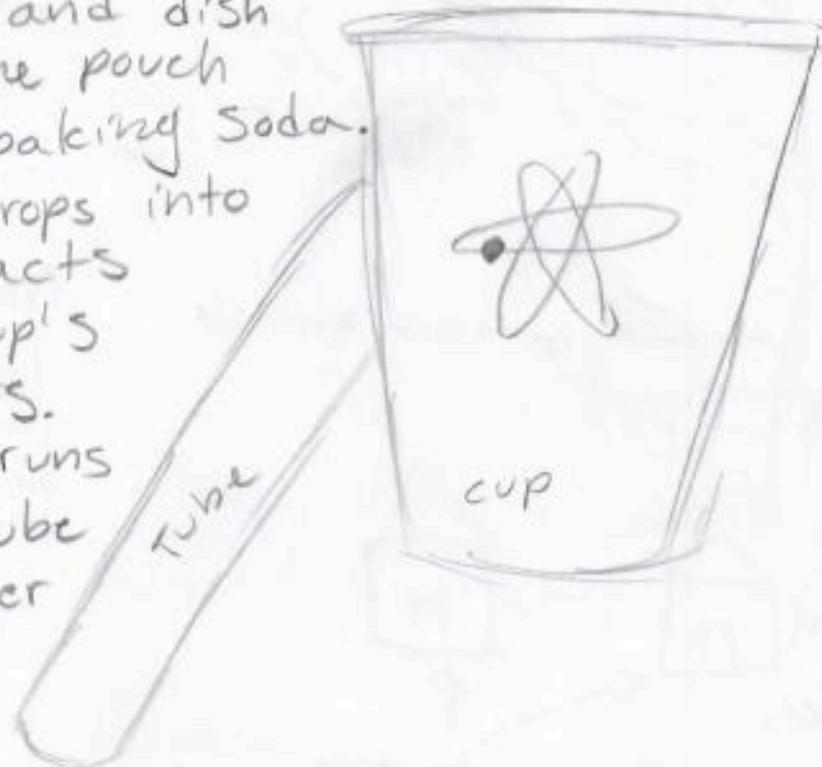


chemical step

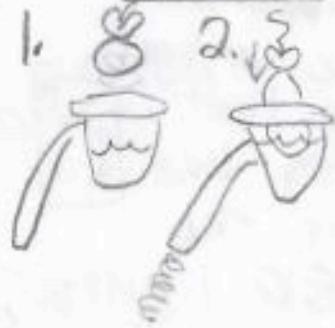
Power Plant

Function

The cup contains vinegar and dish soap. The pouch holds baking soda. Pouch drops into cup, reacts with cup's contents. Sludge runs down tube to trigger next step.



Function Photos

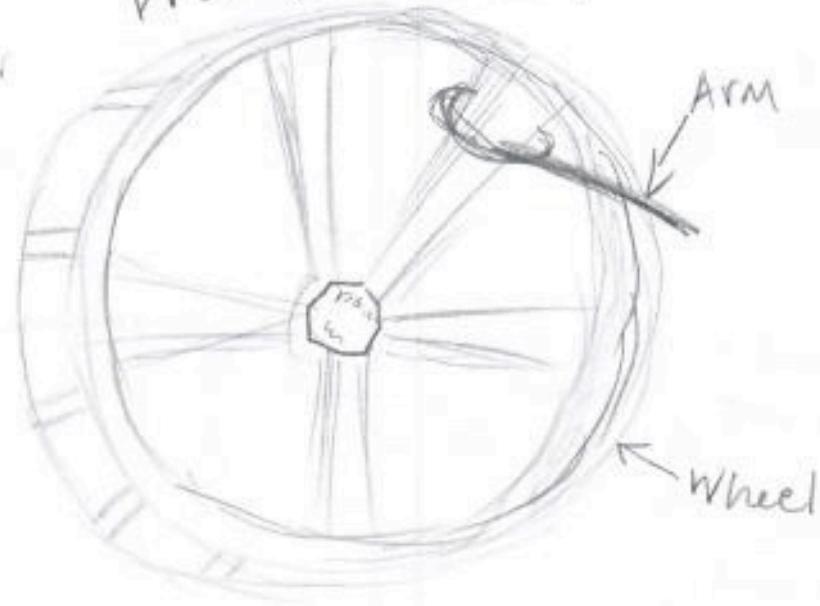


Hydrolic Step

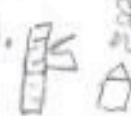
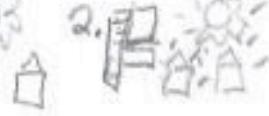
Function

1.  water falls on wheel, and the wheel turns.
2.  Arm triggers next step.

Waterwheel



Electrical Step

1.  2. 

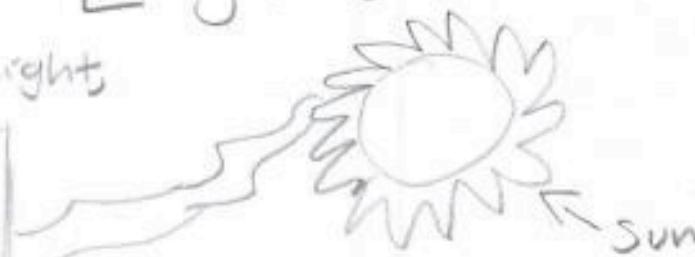
when switch is
pressed by weight
8 volt battery

Powers up LEDs, buck converter
while the converter
lowers the voltage

so that it's best
for the LED lights.

Cables keep everything connected.

Lights



Note: LED
lights are
inside houses
and sun.

This project helped me a lot with learning to work as a team. It was especially hard to be patient with my teammates when one of them messed up with the setup portion at our first competition which ended up with a human intervention that deducted points. I liked the art portion of this project, so I want to dive deeper into painting in the future.

— Davian

Please Note - this is a personal reflection

Our theme
is
Renewable Energy

in weeks



I learned that a Buck converter lowers the ~~voltage~~ voltage of a battery so that it slows the flow of electricity. I also learned how to multiply the turns of gears so that the wind mill's wings will turn faster. I think I will be a mechanical engineer when I grow up. I liked doing the wind mill gears and the Hoover Dam lever.

-Dominick
Reflection



personal reflection

I learned a little about electricity. We needed a Buck converter to lower

the power of the battery so

the LED light would not

burn out. In the future

I will be cautious about

what I plug in.

I also got to paint a copy

of the Hoover Dam from

a picture. I love painting
and drawing and this was
a fun way to practice,
practice makes perfect.

— Amelia

To set Machine...

3/26/22

1. Set hoover dam
2. Wind up windmill
3. Fill windmill pouch with 1 spoon baking soda
4. Set funnel in place, be sure no residual on it,
5. Fill power plant with vinegar up to tube and 1 squirt of dish soap and food coloring
6. Set waterwheel; make sure arm is in place
7. Make sure towel + tray don't touch waterwheel and are in place
8. Set up dominoes
9. Wind string around pin once and put weight in place
10. test lights
11. Set mouse trap

To start...

Put marbles in marble funnel and watch!

Aziz

Introduce + machines

problem Volcano / Power plant

Baking Soda not want ~~Vinegar~~ Vinegar

Funnel

Used Funnel

It worked

Intro Apulia - Volcano water

123 Dam - water + Day

4567 P - Electric

89 10 11