

Eleva-Strum Engineering Club

Energy

Team

Cora G.
Garrett Z.
Jared B.
Emily G.

Adviser

Tyson Rohrscheib

Meet the Team

Cora Gehrke
President

“It’s better to ask forgiveness
than to ask permission.”



Garrett Zimple
Engineer

“If your gonna be stupid
you’ve gotta be tough.”



Jared Bohn
Engineer

“If you don’t keep up, you will become obsolete.”



Emily Gehrke
Secretary

“One step forward at a time, you’ll get there eventually.”

Tyson Rohrscheib

Advisor

“All it takes is all you got”



Machine



Steps

Step 1

Water is poured into the bucket to start the machine.



Step 2

Water flows down the tube and into the cup to act as a weight.



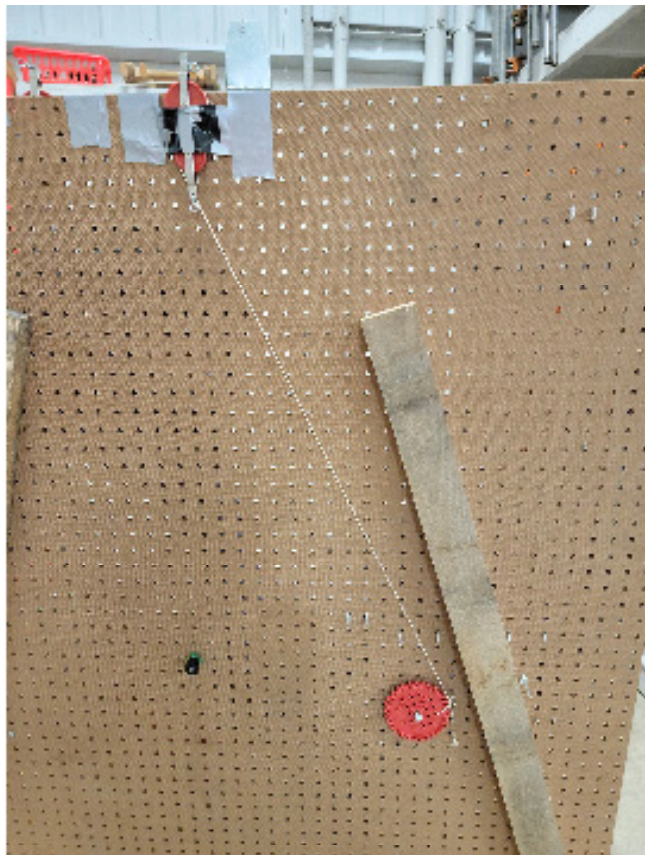
Step 3

Attached to the cup is a string that is run through a pulley system on both the front and back of the machine.

This is one of the many mechanical components in our project.

Step 4

On the back of the machine the string runs from the pulley system and pulls on the gear causing it to turn.



Step 5

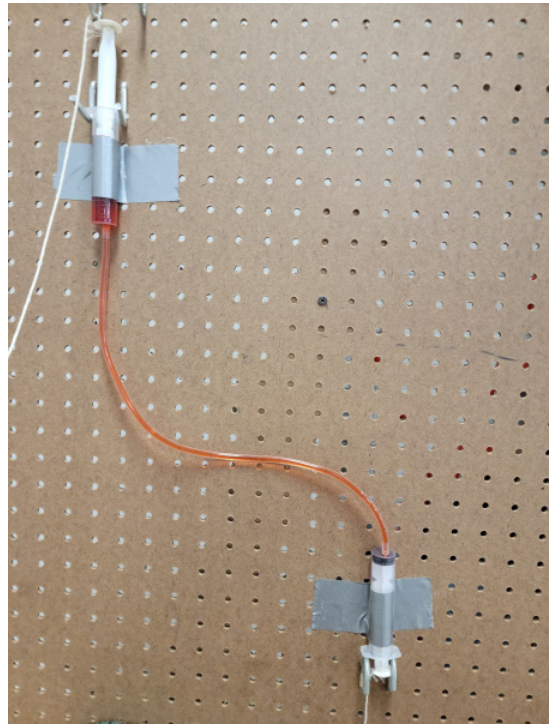
The gear on the back spins the two gears on the front causing the weight to fall off and pull on a string. The string is tied to a syringe.



Step 6

When the string pulls on the syringe it causes the water to be pulled downward. This is also known as hydraulics.

This is the fluid force of our project



Step 7

As the top syringe is being pulled downward it pulls on a string attached to a container of beads.



Step 8

The container of beads is pulled off causing the lever to tip and the metal weight to fall.



Step 9

The weight pulls on a string which is connected to another string. This is where the project splits (steps 10 and 13).



Step 10

The string then releases a marble which roles down an incline plain.



Step 11

As the marble rolls down it hits a small container that then falls into a larger container.



Step 12

This causes our chemical reaction which is sodium hydroxide mixing with phenolphalein to create a color change.



Step 13

(Starting from step 10)
The string lifts a cup which allows a marble to run down the tire. The marble lands in a cup which then pulls another string.

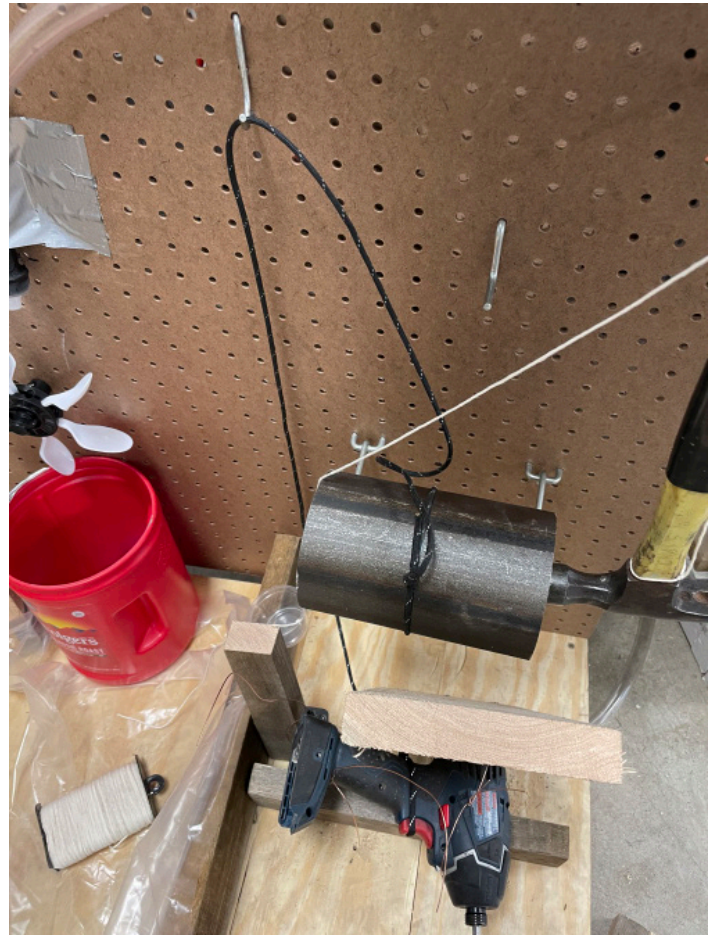
Step 14



The string releases the hammer which swings down and hits the metal rod.

Step 15

Metal rod falls which pulls a string attached to the drill. The string on the drill pulls the trigger causing it to start.



Step 16

The drill is connected to the motor by an adapter that Garrett made. When the drill starts it turns the motor causing it to produce electricity.

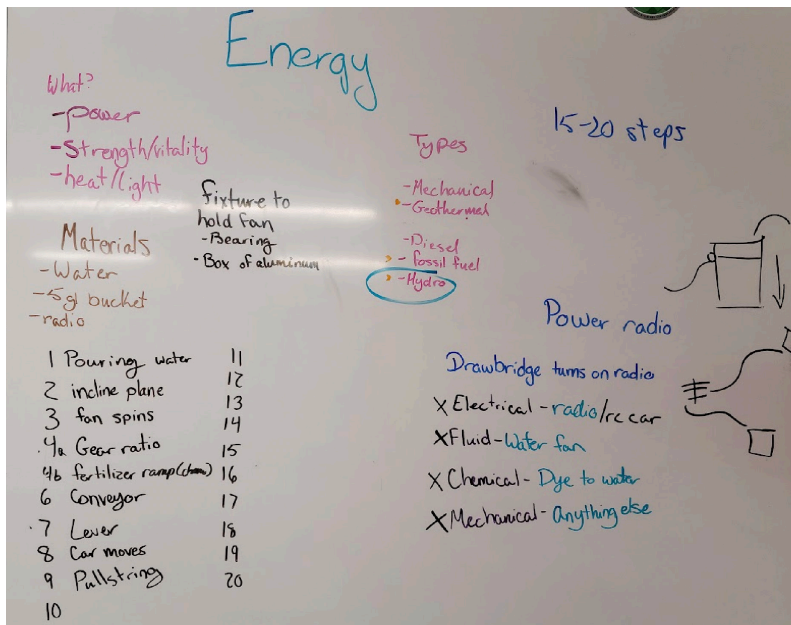
This is our electrical and final component

Original Plan

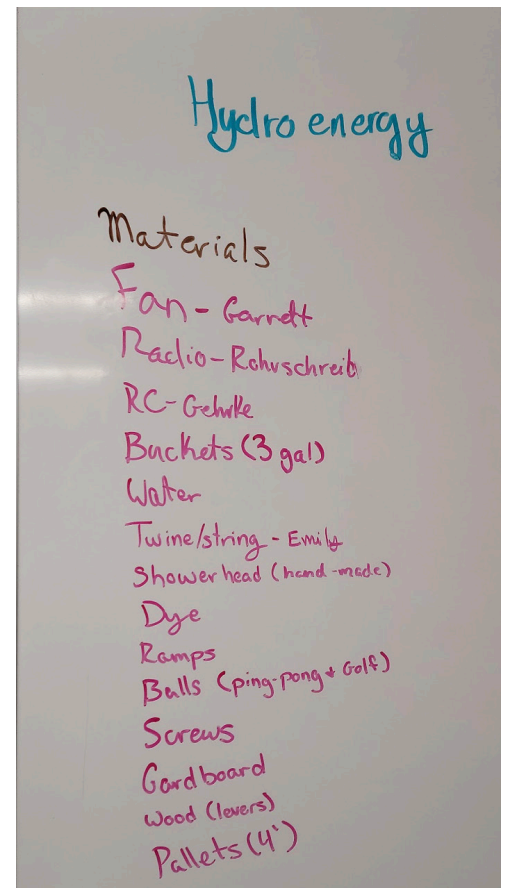
Hydro energy

- 1 Pour water
 - 2 incline
 - 3 fan spins
 - 4_a Gear ratio
 - 4_b fertilizer ramp
 - 6 conveyor
 - 7 Lever
 - 8 Car moves
 - 9 Pull string
 - 10 Remove cover / release water
(shower head)
 - 11 hit lever
 - 12 Rolls ball
 - 13 hit lever
(item drops)
 - 14 Pull string
 - 15 Lift wall
 - 16 Incline plane
 - 17 Lands in bucket
 - 18 Lift wall Lift object
 - 19 ? hit lever
 - 20 Play radio "Celeste the champions"
- Elec. — RC / Radio
Fluid — Water fan
Chem — Dye
Mech — anything else

Progress Photos



Spent the first 5 meeting going over rules and defining energy.



Starting to gather materials

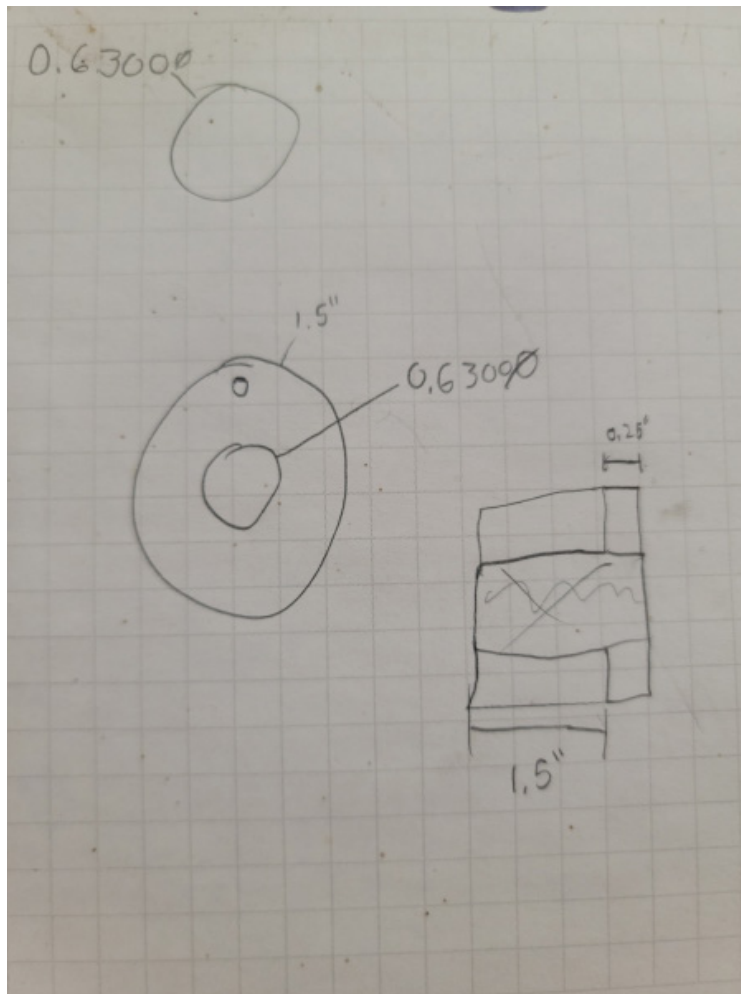
Putting stuff together and testing here and there.



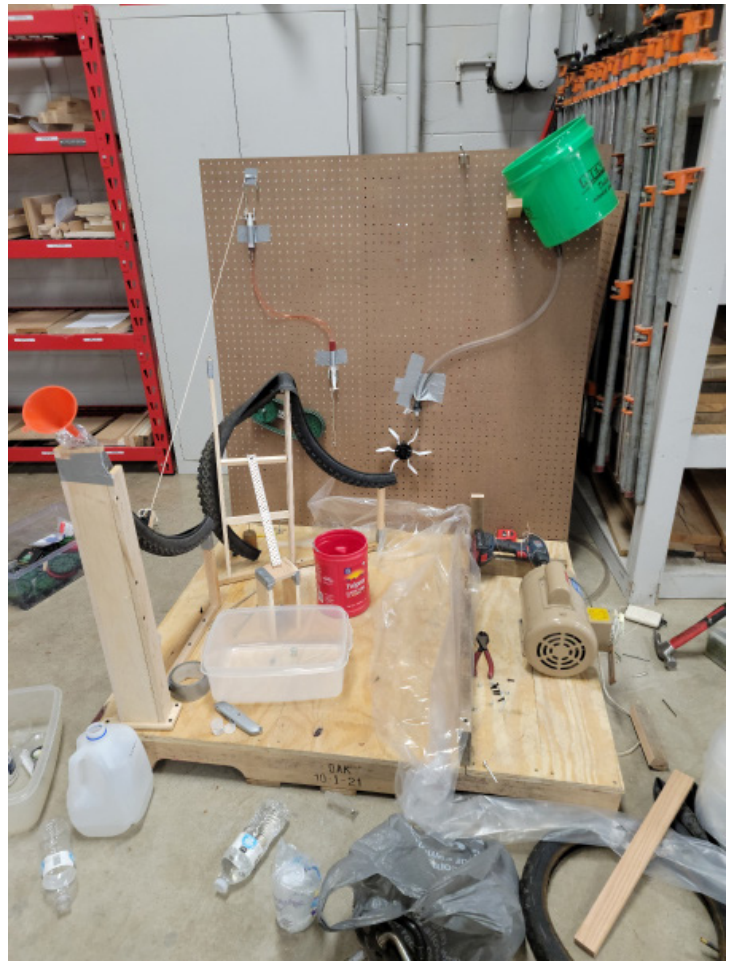


About halfway there!

Garrett had to design an adaptor to fit the drill to the motor.



It's a mess but that's because we've changed and adjusted a few components and we're not done quite yet.



This is what our finished project looked like for the Reginal Contest in March.

Jared figuring out the pulley system.



Spray painting the machine for aesthetics.

Adversities & Solutions

Time Management

- Starting meeting October 21st once a week for 30 minutes (working around clubs and sports)
- Mid December to January 20th (5 weeks) we didn't meet because of a family emergency, holiday break, and then covid quarantine for two weeks.
- January 20th and 27th team members missing for various reasons.
- February 10th decided to meet twice a week.
- Did not have project close to done.
- March 7th met after school everyday til about 7pm. to finish project.
- March 10th met at 6:15 to 7:45am
- After the Regional Competition we took a break for 3 weeks.
- Met on April 7th at 6-7:30am, then we met Tuesday's and Thursday's 6-7:30am.

Chemical Reaction

- Realized mixing food dye and water was a physical change and not a chemical reaction.
- Talked to chemistry teacher.
- Diluted Sodium Hydroxide (NaOH) mixes with diluted phenolphthalein (Ph) to change color.

Electrical Component

- At first we thought of turning on a radio but realized it was too complicated for the short time period.
- Then we were going to count turning on a lightbulb but we'd need an outlet so that was discarded.
- Now, our electrical component is the drill used to turn the motor.

Water Wheel

- We started with a water wheel that would catch water and spin the gears on the back.
- It only worked twice out of all the times we tried to run it.
- We opted to change the wheel into a pulley system instead.

Team Reflection

We learned stuff doesn't always work as planned and that the team needs to be flexible in order to get stuff done. Being flexible allows ease for getting along with others when tensions are high, which is a skill that can be used in every senario for every career.

Materials

Recycle

70% are recycled

Bought

2 gal bucket ~ \$2.22

Food dye ~ \$2.75

Lead weights (beads) ~ \$11.99

Word Count

866 words

Bibliography

Thanh. "Is Adding Food Coloring to Water a Physical or Chemical Change?" ForNoob, 28 Apr. 2021, <https://fornoob.com/is-adding-food-coloring-to-water-a-physical-or-chemical-change/>.

This site was used to determine if using food dye to change that water color was a chemical or physical change.
Turns out its a physical change.

Special Thanks To:

Mr. Walter

Mrs. Marsolek

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Mike and Tom

Mr. Cegielski

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