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 syring.
Step 6

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

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 leaver 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
4a. Gear ratio
4b. Fertilizer ramp
5. Conveyor
6. Lever
7. Car moves
8. Pull string
9. Remove cover/release water (shower head)
10. Hit lever
11. Roll's ball
12. Hit lever (three drops)
13. Pull string
14. Lift well
15. Incline plane
16. Lands in bucket
17. Lift wall lift object
18. Hit lever
19. Play radio "Celebrate the champions"
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.
Garrett had to design an adaptor to fit the drill to the motor.

About halfway there!
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 every day 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 phenolphathalein (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 scenario for every career.

Materials

Recycle

70% are recycled

Bought

2 gal bucket ~ $2.22
Food dye ~ $2.75
Lead weights (beads) ~ $11.99
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

Mrs. Peterson

Mike and Tom

Mr. Cegielski

Cardinal Manufacturing

The Tinker Shop