

## TOPIC IDEAS

DATE: / /

### INNOVATIVE / EXPERIMENTAL

- \* ① Food Waste Battery (food/fruit & salt water powered car)
  - make a small model that demonstrates/uses food waste or fruit & salt water (conductivity?)
- ② Steam / Water Powered Machines
  - make a model powered by natural sources (ex: water, wind)
- ③ Trash Wheel Device
  - to help get rid of waste in ocean
- ④ Liquid Lens Telescope
- ⑤ Irrigation System
- ⑥ Navigation Device



## SCHEDULE & TIMELINE

DATE: / /

### 2024 - 2025 TIMELINE

#### DATE

- ✓ Oct 7: School Registration Opens
- ✓ Oct 7: Project Registration Opens
- ✓ Dec 13: School Registration Closes
- ✓ Dec 16: Independent Registration Opens
- ✓ Jan 13: Judging Registration Opens
- ✓ Feb 7: Independent Entry & Project Registration Closes
- Mar 21: Project must be completed online
- Apr 10: Project Setup at the Olympic Oval
- Apr 11: Medal Round & Award Round Judging
- Apr 12: Awards Ceremony
- Apr 30: Deadline for students selected for CWSP to submit project & info
- May 31 - June 7: CWSP in New Brunswick

School science fair date: March



## SCHEDULE & TIMELINE

DATE: / /

### DATE

- Oct 21: Registered into LYSE with my school (Colonel Irvine)
- Nov 3: Made a list of possible science topics/ideas
- Nov 8: Determined my science fair topic
- Nov 10: Completed basic project info
- Nov 17: Approved my ethics due care form
- Jan 10: Began researching & worked on "problem" section
- Jan 17: Finished "problem" section
- Jan 24: Acquired trifold
- Jan 26: Began working on "method" section
- Jan 29: Re-submitted & edited ethics form
- Feb 2: Re-approved ethics form
- Feb 2: Began working on prototype/demonstrations (testing)
- Feb 17: Worked on "method" section
- Feb 18: Worked on "method" & "analysis"
- Feb 23: Finished half of "analysis"

### TO DO LIST:

- ☒ Order/get trifold
- ☒ Buy materials → gears, motor, zinc, copper, axles, wheels, alligator clips, etc. (70 points)
- ☐ Finish online portion of science fair
- ☐ Finish trifold

### SCHEDULE

- ☒ Finish "problem" section by Jan 12
- ☒ Finish half of "method" section by Jan 19
  - ↳ ☒ Work on it (Jan 16-19)
- ☐ Finish "method" section by Feb 28
- ☐ Finish "analysis" section ~~Feb 28~~ Feb 28
- ☐ Finish "conclusion" section Feb 28



## About a Basic Battery

↳ electrolytes: is a substance that conducts electricity through the movement of ions (not movement of electrons)

↳ includes salts, acids & bases dissolved in water

ex: saltwater

↳ electrodes: two different types of metal that react with electrolyte

CATHODE

↳ one releases electrons to create positive ions & one

gains electrons to create negative ions

↓  
ANODE

## Invention of Battery

↳ 1780: Luigi Galvani believed that there was electrical fluid in a frog's tissues (made an experiment with dead frogs hung on brass hooks that twitched when touched with other metal)

↳ 1800: Alessandro Volta believed that the electricity came from the metals & created the first battery which consisted of copper & zinc with paper soaked in saltwater  
Saltwater & Fruit Electrolyte

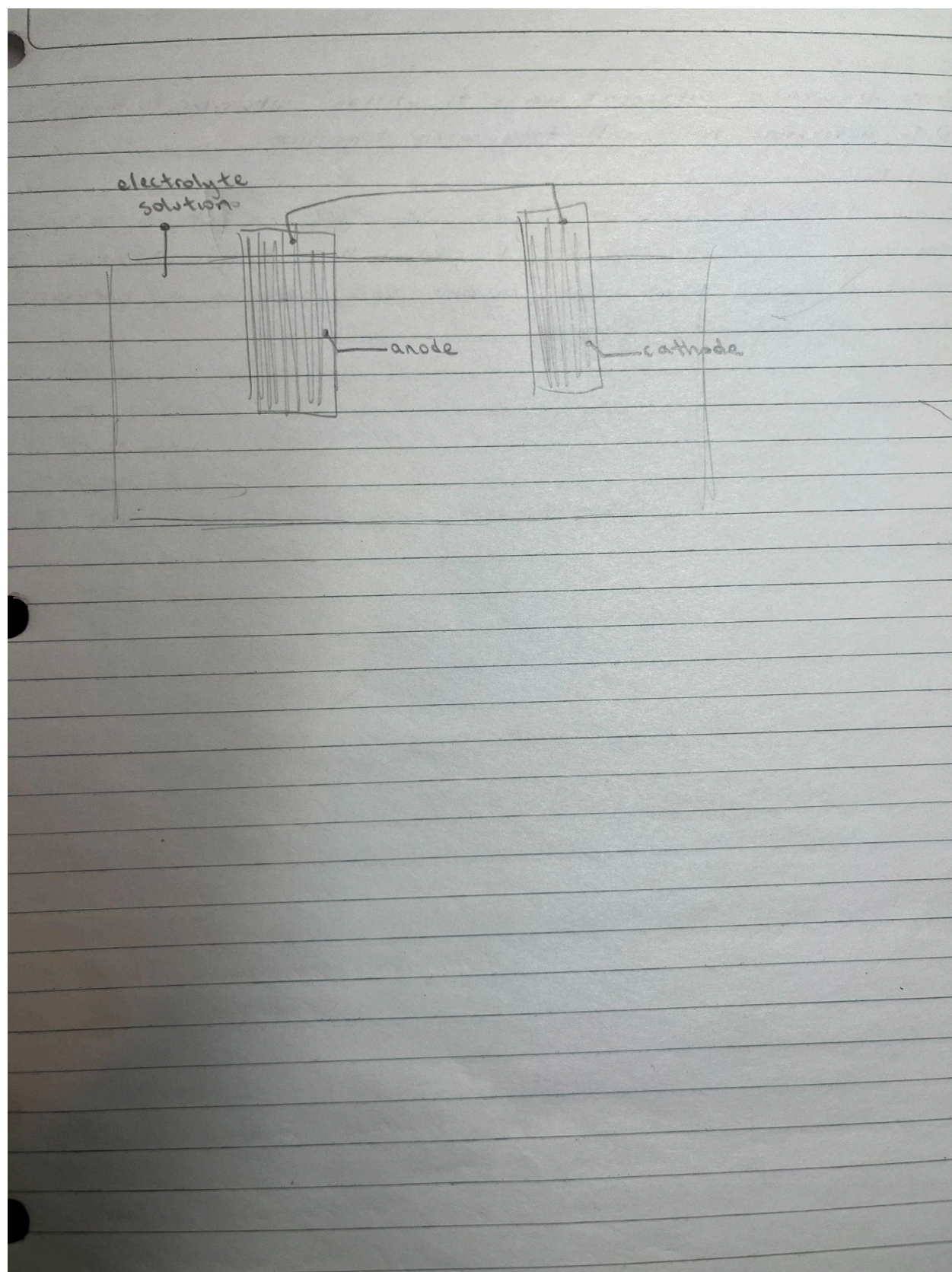
↳ food-based acids mixed in with saltwater can generate energy

↳ saltwater is a very good conductor & electrolyte

↳ is organic & eco-friendly

↳ non-flammable, less costly & more available







Objectives

- ① To demonstrate different ways to utilize saltwater & food
- ② To determine how well they work together

Hypothesis

Since different foods, as well as saltwater, can act as electrolytes and have conductive properties, I predict that they will be a good source of energy when used together, and may be a potential source of renewable energy.



## MATERIALS

DATE: / /

### To Buy

- ✓ Zinc sheets
- ✓ Copper sheets
- ✓ Alligator clips

1. Zinc
2. Copper
3. Alligator clips
4. D.C. motor
5. Multimeter
6. Saltwater
7. Food waste - lemon juice, test w/ others?

## Discussion & Results

DATE: / /

No Treatment (300ml & 15g)

0.73 volts

Increased Salinity / Higher Concentration (300ml & 30g)

0.50

Control

1.53 volts

Boiled Potato

0.80 volts

Food waste in saltwater



## CONCLUSIONS

DATE: 1/1/21

Hypothesis was correct.

Was able to create a battery with both saltwater & food waste.



## RECOMMENDATIONS / APPLICATION

DATE: / /

I would like to find different methods to increase & extend their longevity, as well as different methods to extract it.  
construct the materials needed into more convenient batteries

Lithium batteries are flammable, whereas saltwater is not  
↳ saltwater doesn't cause toxic chemicals  
↳ not harmful to environment