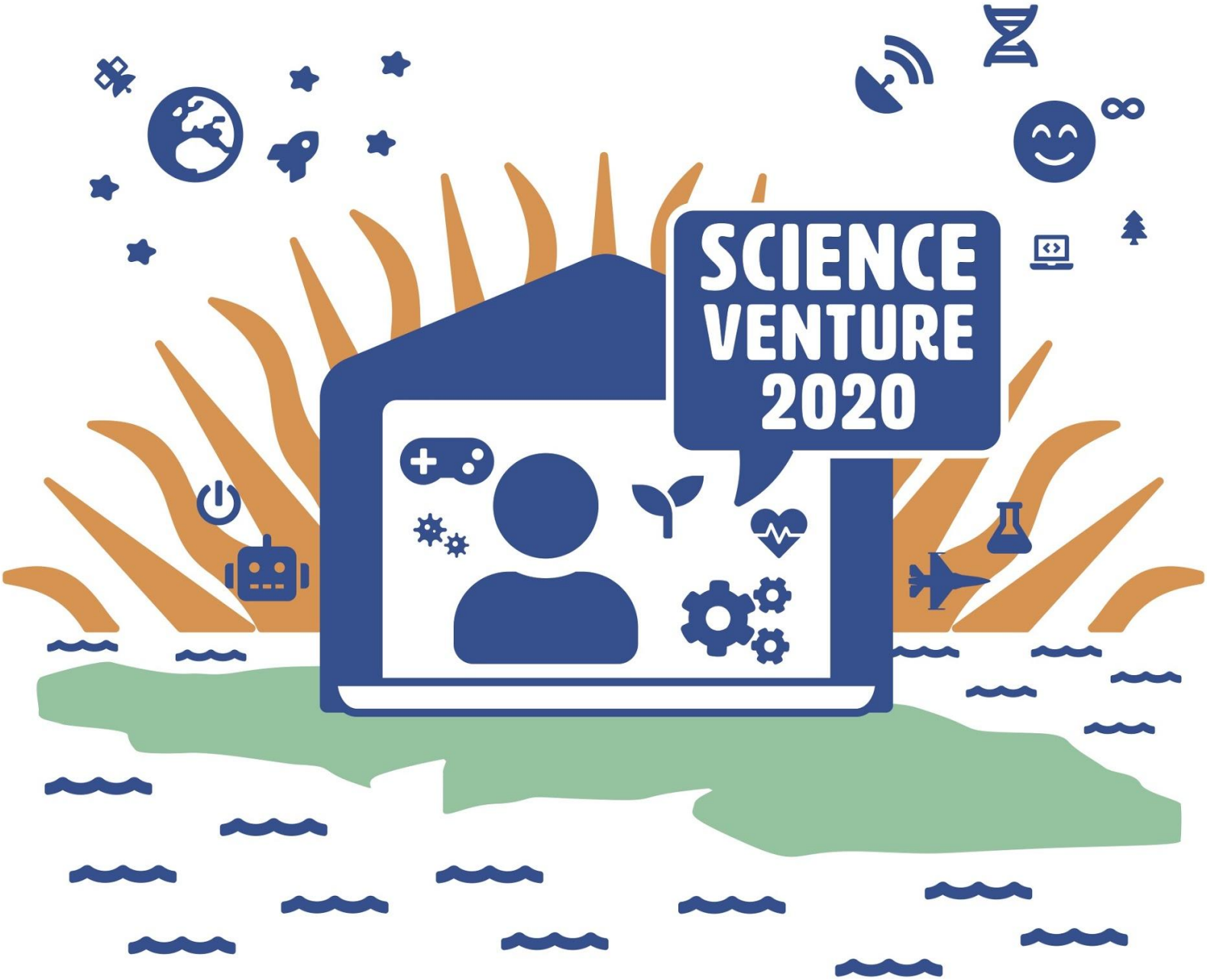


Oceanography

Outstanding Ocean Electricity

Students will test the conductive properties of salt water through an experiment using a battery, light bulb and increasing concentrations of salt water. Students will visually display their results by creating a scatterplot to draw conclusions.

Materials

- Copper wire
- Electrical tape
- 9-volt Battery
- Mini Light Bulb (3.7 volt) and socket
- Bowl
- Water
- Salt
- Popsicle stick
- Aluminium foil

Safety Considerations

- Be careful when cutting copper wire - adult assistance highly recommended

Keywords & Concepts

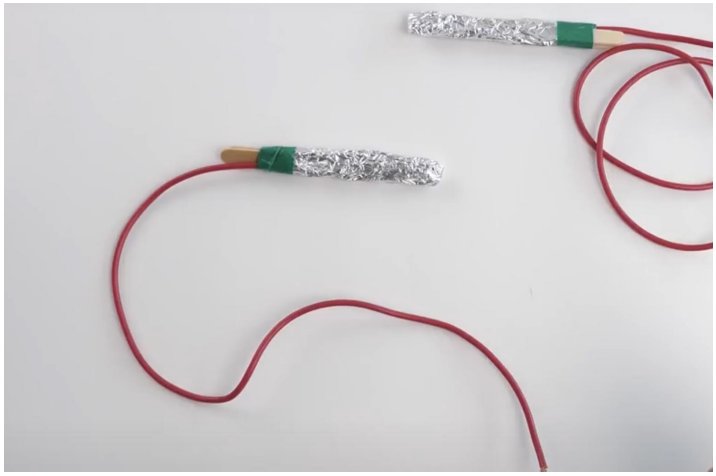
Conductivity of water depends on the concentration of dissolved ions in the solution. **Salt** is an ionic compound made from sodium and chloride ions. When in water the sodium and chloride ions dissociate and are floating freely surrounded by water molecules. These ions are charged and are able to carry **electricity** through water with an electric current.

Outstanding Ocean Electricity

Making a Saltwater Battery

By using salt water, a battery, aluminium foil, copper wire and small lightbulb, you can test the conductive properties of salt water.

Steps



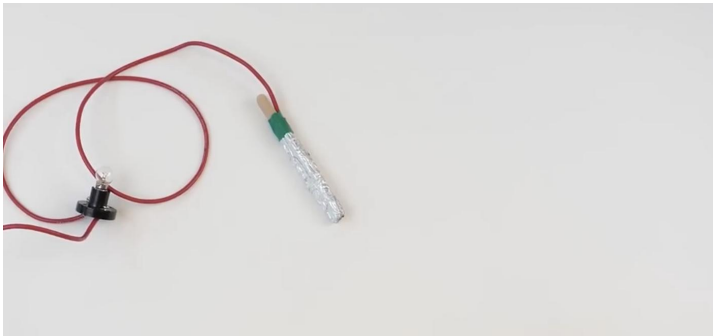
1) Cut 3 pieces of copper wire as long as you would like your circuit to run. On one end of 2 of the copper wires, connect it to a popsicle stick by wrapping aluminum foil around. This will give it more support.

2) For one of these copper wires, attach the other end to the light bulb.

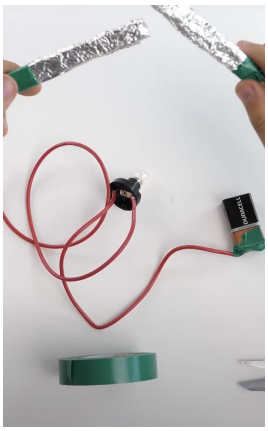
3) For the other copper wire, attach it to the battery. To keep it holding on, use electrical tape.

4) On the last piece of copper wire, attach one end to the battery as well. Use electrical tape to secure it.

5) You should have a long string of items now. It should go: Popsicle stick, copper wire, battery, copper wire, lightbulb, copper wire, popsicle stick. Test it out! If you tap both of your aluminum foil covered sticks together, your lightbulb should light up.

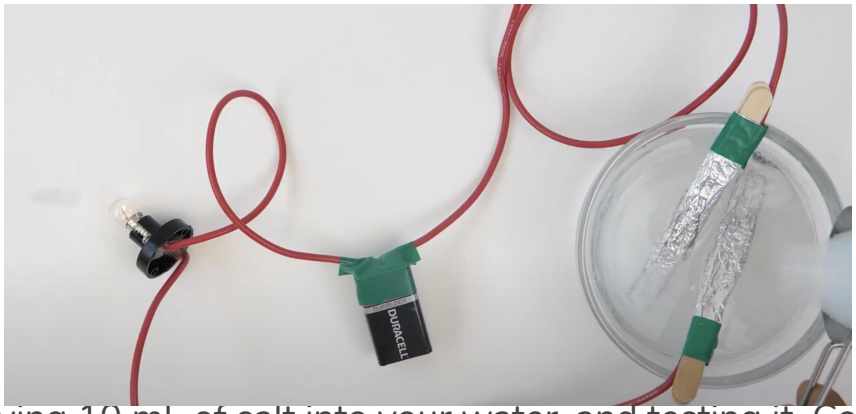


Outstanding Ocean Electricity



6) Next, you will make your saltwater conductor. To do this, fill a bowl with water. Stick your popsicle sticks in - does anything happen?

7) .....Not yet! The water is not charged, and there are not enough ions to make it electrically charged. How can we change this? By adding salt! The sodium ions in the salt will dissolve in the water to make it a great conductor for our lightbulb.

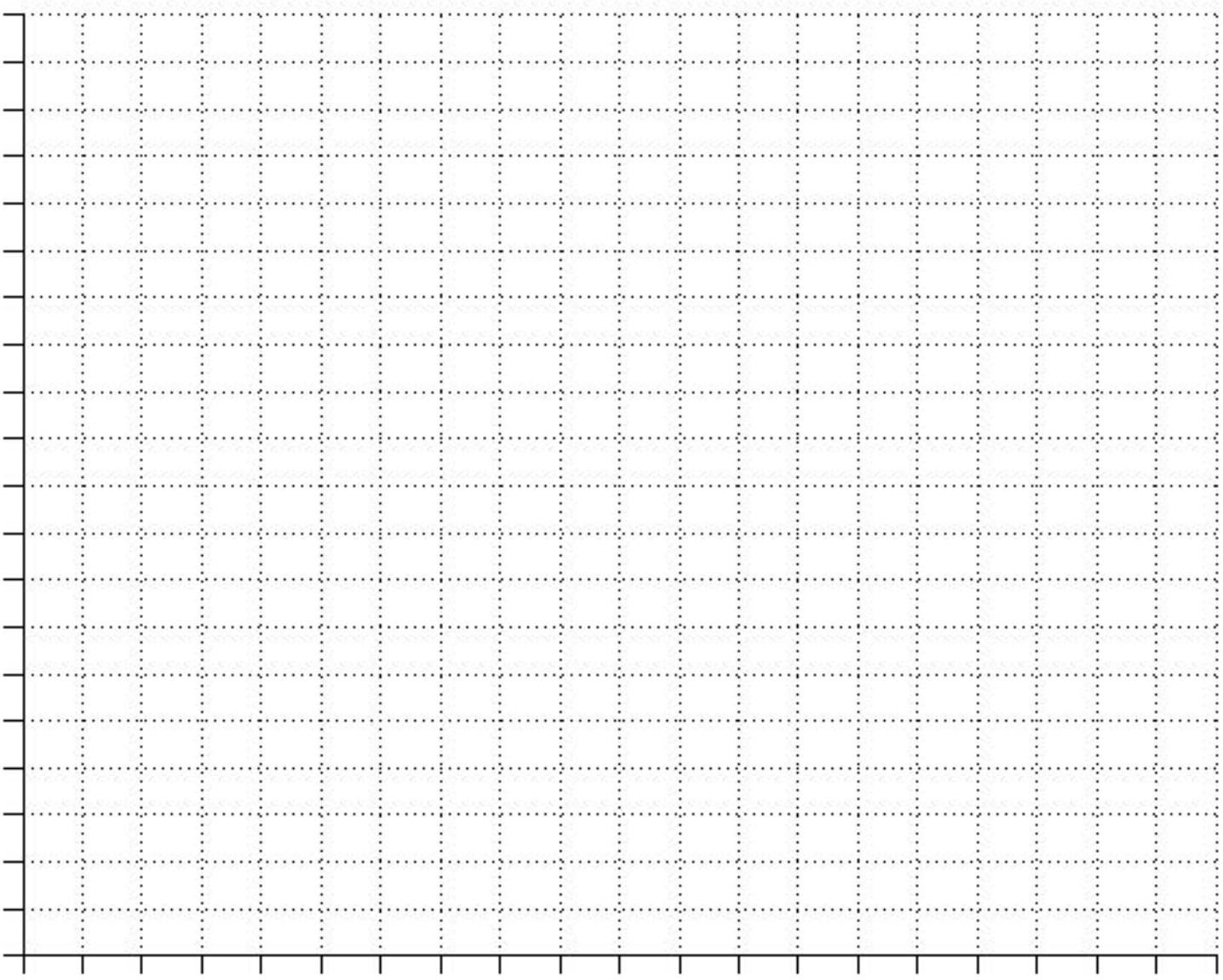


8) Start by dissolving 10 mL of salt into your water, and testing it. Continue dissolving salt in 10 mL increments (20 mL, then 30 mL....etc) all the way until you reach 70 mL.

9) Record this on a table and create a scatter plot on the graph provided. What concentration of salt works best for electrical conduction?

Salt (mL)	**Light bulb strength (off, low, medium, high)**
10mL	
20mL	
30mL	
40mL	
50mL	
60mL	
70mL	

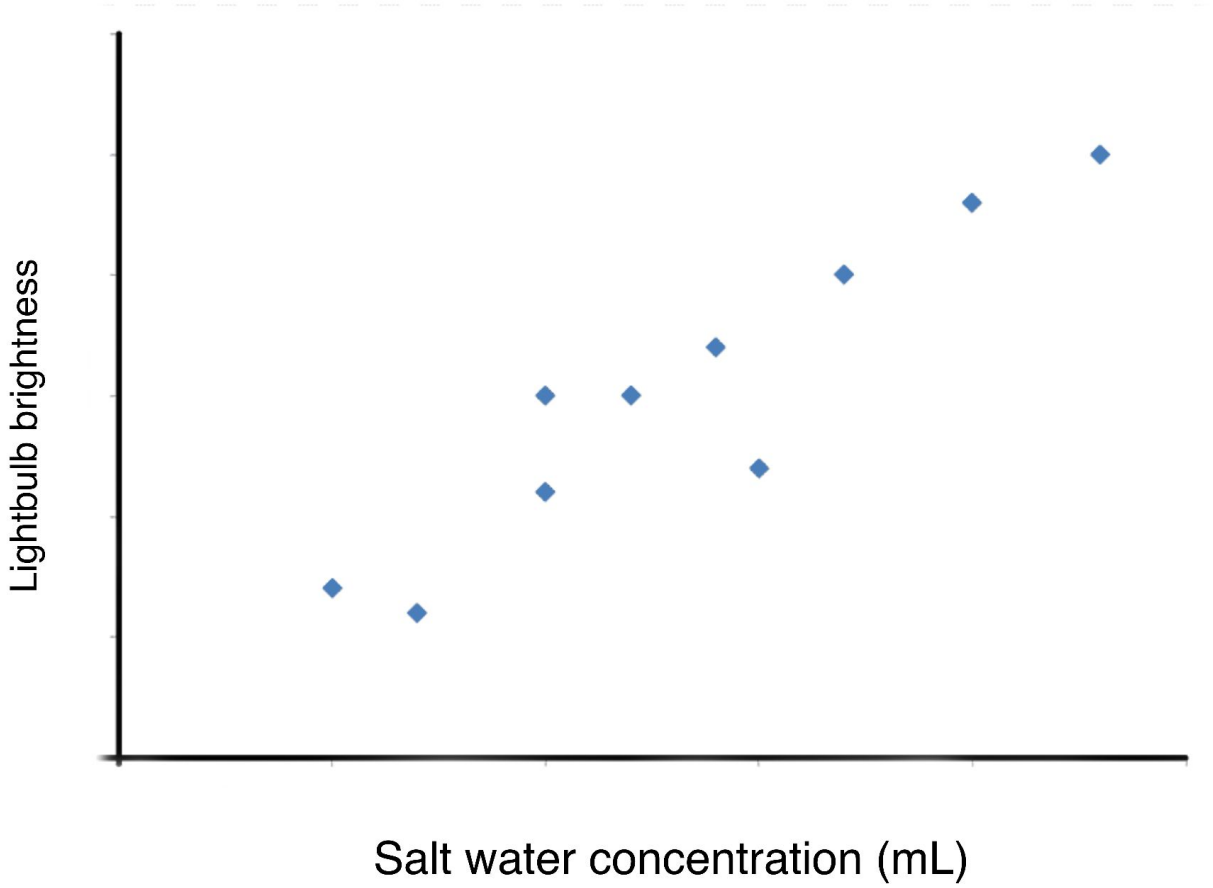
Outstanding Ocean Electricity



Outstanding Ocean Electricity

Debrief

Example Graph



Once you've reached 70mL: What happened? How much salt is needed to conduct enough electricity to power the lightbulb? When did your light bulb brightness start to get stronger - at what concentration?

#SVatHome

Want to share your project or results with us?

Email or tag us @ScienceVenture

Have a question?

Reach us at svcamp@engr.uvic.ca