

Technology Idea: A Coin Cell

Background:

For a wet cell to be effective, two different metal electrodes and an electrolyte are necessary. Because the coins in your pocket are made of different metals, an effective wet cell can be built with the spare change.

In this activity, coins will be used to construct a wet cell.

Question:

How can coins be arranged to make a functioning wet cell?

Materials:

- voltage sensor and alligator clips
- USB link
- 1 dime and 1 penny
- construction paper
- eraser
- beaker of saltwater solution
- wire (optional)

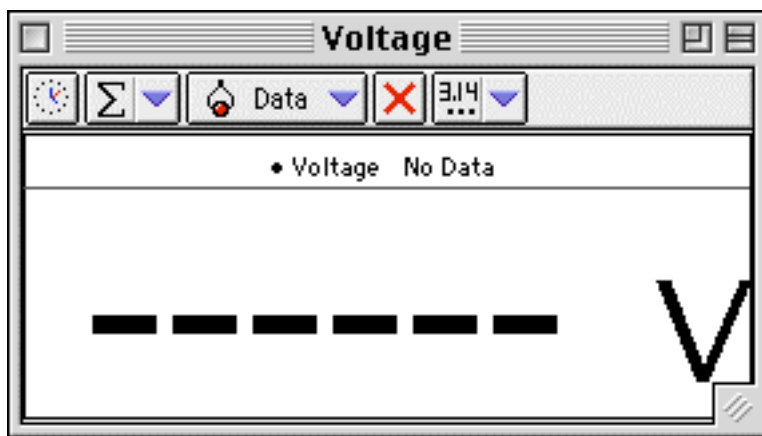
Procedure:

Step 1:

Obtain a voltage sensor, it looks similar to the picture below:



Plug the sensor into the USB link (that is connected to the computer or hand held data collection unit). If you are using a computer, set it up to collect voltage data on a digital display. For example, if you are using DataStudio software, your setup screen and display should look something like this:



Step 2:

Clean each of the coins using the eraser. They should be clean and shiny, wash them with soap and water if necessary. Another way to help clean them is to soak them overnight in household vinegar.

Step 3:

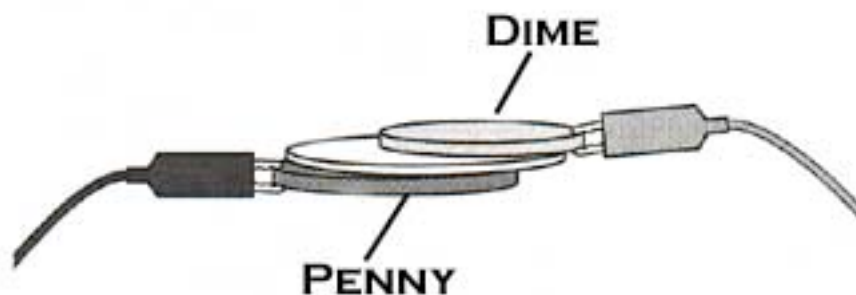
Cut the construction paper into a round circle slightly larger than the penny. Soak the construction paper in salt water.

Step 4:

Using alligator clips, clip the voltage sensor leads onto the coins:



Use the coins to sandwich the soaked construction paper between them:



Step 5:

Start collecting data and continue for about 30 seconds, then stop. Record how much voltage your coin cell produces. If your voltage readings are very low, try cleaning the coins again and adding more saltwater to the construction paper.

Analyze:

1. How much voltage did your coin cell produce? How might you change your stacked coin cell in order to increase the amount of voltage that it produces?
2. Take the two coins and place them directly into the saltwater in the beaker. Collect voltage data as you did with the stacked coins. Does this produce more, less, or the same amount of voltage? Provide an explanation for your voltage observations.

Conclude and Apply:

3. Write an answer to the following question:
 - How can coins be arranged to make a functioning wet cell?
4. If you were given 5 pennies and 5 dimes to repeat this experiment, how would you arrange the coins? Would this be a "cell" or a "battery"? Explain.