Reprocudtive health bill

Health & Medicine

Chelsea Samatra, Kenneth Ragus Samatra, Ragus 1 Ms. Daligcon Period 4 A Battery That Makes Cents Abstract Many coins in the pile will make the most electricity. If there are more coins in the pile, then the more electricity it can produce, because the more electrons you have, the more electricity you will get. Batteries are expensive, but you can make one for exactly 24 cents! In this experiment, you will make your own voltaic pile using pennies and nickels. In the data, we will see if the number of pennies and nickels will affect the number of voltage and current.

Problem How many coins in the pile will make the most electricity? Hypothesis If there are more coins, then the more electricity it can produce, because the more electrons you have the more electricity you will get. Samatra, Ragus 2 Background/Research You might think that batteries are a modern invention, but batteries were one of the first ways of making electricity. Alessandro Volta discovered the first electric battery in 1800. He made a giant stack of alternating layers of zinc, blotting paper soaked in salt water, and silver. This early design for a battery became known as the voltaic pile.

How does a voltaic pile make electricity? The key to electricity is the movement of electrons. In a voltaic pile, electrons move from one metal to the other through the saltwater solution. The saltwater solution is called an electrolyte, and it contains ions in solution from the dissolved salts. An ion is a group of atoms that carries a positive or negative electric charge. The ions react with the metals, causing an electrochemical reaction, a special kind of chemical reaction that makes electrons. The two types of metals in a voltaic pile are called electrodes.

Since there are two kinds of metals, one metal reacts more strongly than the other, which leaves an electrical potential difference, also called voltage, between the two types of metals. One metal becomes positively charged, the positive electrode and the other becomes negatively charged, the negative electrode. This causes electrons to move, creating an electrical current which is measured in amperes, and then you have electricity! In addition, the formula for voltage is current times resistance or V = I*R, so the formula for current will be voltage divided by resistance or I = V/R.

Samatra, Ragus 3 Vocabulary Words: * Electrochemical Reaction - branch of chemistry that deals with the chemical action of electricity and the production of electricity by chemical reactions * Electron – Also called negatron, an elementary particle that is a fundamental constituent of matter * Voltaic Pile - battery consisting of voltaic cells arranged in series; the earliest electric battery devised by Volta. * Electrolyte – a liquid or gel that contains ions and can be decomposed by electrolysis. Materials The materials and equipments that are needed for the experiment are: * Pennies (4) Nickels (4) * Mild dish soap * Vinegar (any kind, 1/4 C.) * Salt (1 Tbsp.) * Small bow * Small plate (ceramic, plastic, or Styrofoam not paper or metal) * Digital multimeter (any kind that reads mA and mV) Samatra, Ragus 4 * Paper towels (2) * Scissors The procedures for the experiment are: 1. In a small bowl, mix together 1/4 C. of vinegar (electrolyte) and 1 Tbsp. of salt (ions). 2. Using scissors, cut up a paper towel into small squares. 3. Place the small squares to soak in the bowl of salt-vinegar solution, and set them aside. 4.

Gather some pennies and nickels, wash with a mild detergent (like dish soap), and dry. 5. Start building your stack on a dry paper towel on your plate. Put down a penny first, then place a square of vinegar-soaked paper towel on top, and then add a nickel. Keep repeating the layers until you have a stack of four coins (alternating pennies, wet paper towel pieces, and nickels), making sure you end with a nickel on top. 6. Attach the leads of the multimeter to the two ends of the battery by touching one lead to the penny on the bottom and the other to the nickel on the top.

Measure the voltage produced by your battery (in millivolts, mV). You can also measure the current produced (in milliamps, mA). Samatra, Ragus 5 7. Repeat the experiment, each time building a battery with a different number of coins. One important rule is to always start with a penny and end in a nickel, so the number of layers of pennies and nickels will always match. The record of the data table: Number of Pennies| Number of Nickels| Voltage (mV)| Current (mA)| 4| 4| 6. 8| 1. 7| 5| 5| 9. 5| 1. 9| 6| 6| 12. 6| 2. 1|

The data above shows that number of coins in the pile had affected the amount of electricity produced. The viewer can obviously tell that, why? Because the data shows that the more pennies and nickels you have in yorur pile, the more amount of electricity you can produced. The amount of electricity produced on 4 pennies and nickels is 6. 8, why because the resistance was 4 and then the current was 1. 7 and the formula for voltage is V= I*R . The amount of voltage in 5 pennies and nickels is 9. 5 and its current was 1. 9. The amount of voltage in 6 pennies and nickels is 12. and its current was 2. 1. Samatra, Ragus 6 Sample Models This image shows the structure of a voltaic pile, which is the first design of a battery that's used to

make electricity. It was discovered by Alessandro Volta in 1800. In this experiment, you will make your own version of the voltaic pile using two different types of coins and a salt-vinegar solution. How does a voltaic pile made ofmoneywork? Since each coin is made up of a different metal, one metal reacts more strongly than the other, which leaves an electrical potential difference (voltage) between the two types of metals.

The question is, how will different numbers of coins affect the amount of electricity produced? By making piles with different numbers of coins and measuring the voltage and current produced, you can test the effect of changing the number of coins in the piles. Samatra, Ragus 7 Analysis Amount of the Voltage (Pennies ; Nickels) 30 25 20 15 10 5 0 (4 pennies ; nickels) (5 pennies ; nickels) (6 pennies and nickels) The graphs shows that the number of pennies and nickels whether it increase or decrease, it will affect the amount of the voltage (mV).

The graph above specifically shows and tell us that increasing the number of nickels and pennies will increase the amount of voltage. In a very short way, the more pennies and nickels the more voltage and current. The formula for voltage was V = I * R, so the formula for current was I = V/R and then the formula for resistance was R = V/I. Samatra, Ragus 8 Conclusion In conclusion, many coins in the pile will make the most electricity, i proved that my hypothesis was right the more coins in the pile, then the more electricity it can produce, because the more electrons you have, the more electricity you will get.

The data that I made was connected to the research section because the research section, it tells the reader that can the number of pennies and

nickels will affect the amount of the voltage? So my data shows that the number of the pennies and nickels did really affect the amount of the voltage. I will always remember that the more electrons/coins in the pile, the more electricity/voltage it can produced.