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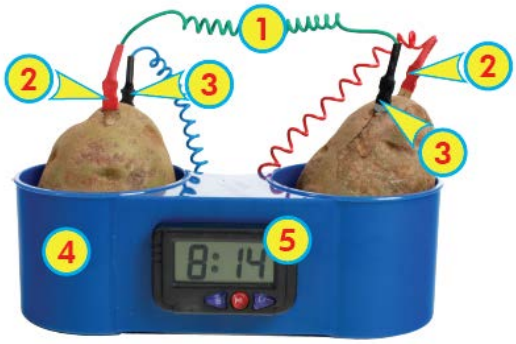
Two Potato Clock
#1314

Warning:

- **Not a toy; use only in a laboratory or educational setting.**
- **California Proposition 65 Warning: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to www.P65Warnings.ca.gov.**



Components:

1. Loose Wire
2. Copper Strip
3. Zinc Strip
4. Potato Holder
5. Clock

Introduction

The Two Potato Clock is designed to demonstrate the principle of an electrochemical cell. The LED clock runs on 2 potatoes, oranges, grapefruits, or lemons. The potatoes are not included.

Specifications

Potato Holder: 6 cm H x 8.5 cm D
LED Display: 20 mm x 45 mm
Dimensions: 21.5 cm x 10 cm x 6.2 cm
Weight: 6.6 oz

Theory

A potato battery is an electrochemical battery, or an electrochemical cell in which a chemical reaction occurs in a liquid between two different metals. When a wire is placed to connect the metals, it carries an electric current. An electrochemical cell converts chemical energy to electric energy.

A battery can be made of many different combinations of metals and liquids. The potato battery uses strips of Zinc and Copper in the acidic juice to produce electric current. Although very small, the current is sufficient to run a digital clock.

In order to obtain enough current to power the clock, we use two potato cells and connect them in series (head to tail). Potatoes can be substituted with oranges, grapefruits, lemons, or tomatoes because these fruits also contain the acid for chemical reactions.

Experiment

Powering the Clock

1. Place two potatoes in the potato holders, one on each side.
2. Insert the Zinc strip from the clock into the potato on the left.
3. Insert the Copper strip of the loose wire into the same potato, about 2 cm from the Zinc. The two strips should not be in contact with each other. For the best result, keep the two strips parallel to each other.
4. Insert the other end of the loose wire- a Zinc strip - into the potato on the right. Insert the Copper strip from the clock into the same potato, about 2 cm from the Zinc. Again, the two strips should not be in contact with each other. For the best result, keep the two strips parallel to each other. The clock should be on now.

Setting the Clock

1. Press M once to activate the clock.
2. Press S twice. Month is displayed.
3. Press M repeatedly to change month. Press S once to set month.
4. Press M repeatedly to change day. Press S once to set day.
5. Press M repeatedly to change hour. Press S once to set hour.
6. Press M repeatedly to change minute. Press S once to set minute.
7. Press M to reactivate the clock.
8. To display date, press D once.

Maintenance

1. Keep the unit from heat, dust, and shock.
2. Use sand paper to remove the coating of the strips when they are oxidized.
3. After each use, remove the potatoes and clean the holder with a paper towel or clean cloth. Do not wash the unit or put it in water.