SMITHSONIAN®

G-Cell Clock

No. 8470-08

Ages 8 and up

⚠ WARNING:
CHOKING HAZARD - Small parts.
Not for children under 3 years.

Conforms to ASTM-D4236

⚠ IMPORTANT NOTE
NEVER DRINK WATER FROM THE TRIOPS AQUARIUM. DO NOT EAT THE FOOD, SALT OR EGGS. KEEP AWAY FROM SMALL CHILDREN/PETS

Dear Customer,

NSI is the manufacturer of this kit. We hope you enjoy your G-Cell Clock. If you find that we have made an error or if something is missing or damaged, let us know so that we can correct the problem for you. Please do not return the kit to the store where you purchased it, or to the Smithsonian, as they do not have replacement parts. Instead, write us a letter and please include the following:

- Name of item
- Model number
- Date of purchase
- Place of purchase
- Purchase price (please include sales slip)
- Brief description of the problem

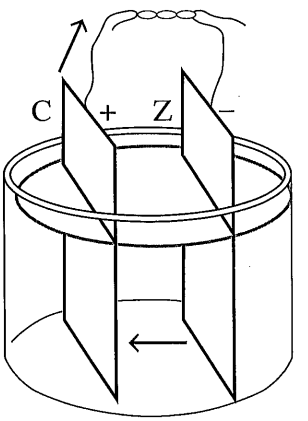
READ THE INSTRUCTIONS BEFORE USE, FOLLOW THEM AND KEEP THEM FOR REFERENCE. KEEP SMALL CHILDREN AND ANIMALS AWAY FROM EXPERIMENTS. STORE THE SET OUT OF REACH OF SMALL CHILDREN.

We will do our best to satisfy you.

Quality Control Department- Natural Science Industries
105 Price Parkway Farmingdale, New York 11735-1318 Telephone: 888-425-9113

INTRODUCTION

What makes the Orange Juice Clock work?



The Orange Juice Clock works because of a discovery made over 200 years ago by the Italian scientist Alessandro Volta. He discovered that when a strip of the metal zinc touches a strip of the metal copper, a tiny electrical reaction occurs and when they are pulled apart the zinc has a positive electrical charge and the copper has a negative charge.

It was later discovered that if the two metals are put in a liquid that is acidic, a chemical reaction occurs with each metal and when a wire is placed to connect the two metals, it carries an electric current (see the illustration).

This apparatus was originally called an electric cell. Because it was not very powerful, many cells needed to be connected to produce a strong current and these groups of cells were called batteries. The path that the electricity followed as it went from cell to cell was called an electric circle. In time, any device that produced an electric current by chemical reaction came to be called a battery and the path that the electricity followed came to be known as a circuit.

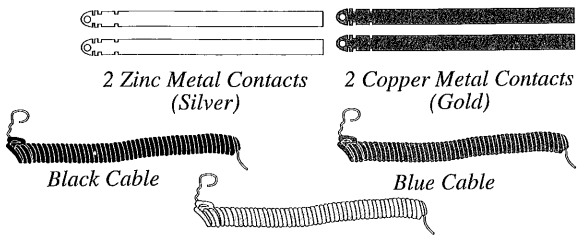
We now know that a battery can be made from many different combinations of metals and liquids. Batteries can be designed for specific uses, depending on how powerful they need to be, how small they need to be, and how long they need to work. In some batteries, the chemical reaction that produces electricity can be reversed by putting an electrical current back into the battery. These batteries are said to be "re-chargeable."

The G Cell Battery uses strips of Zinc and Copper to make the electric current that powers the clock. The liquid you use should be a weak acid that reacts with the two metals and helps to carry electrical charge between them. The electricity produced is not very powerful, but it is strong enough to run the clock for a fairly long time.

To learn more about batteries and electricity, visit your local library or search the web for terms like "how does a battery work" or "history of electricity."

DO NOT DRINK SODA AFTER USED!

COMPONENTS OF THIS SET



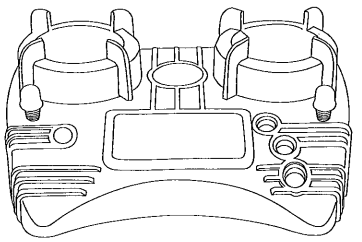
2 Zinc Metal Contacts (Silver)

2 Copper Metal Contacts (Gold)

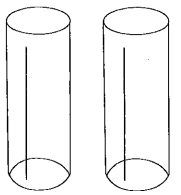
Black Cable

Blue Cable

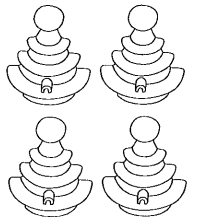
Red Cable



Clock Module



2 Energy Cells



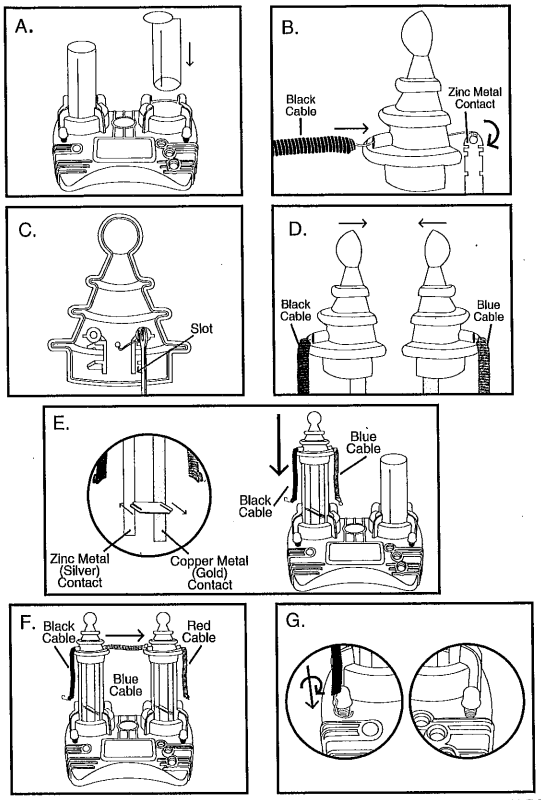
4 Half Contact Holders

2 Contact Dividers

HOW TO ASSEMBLE G-CELL CLOCK

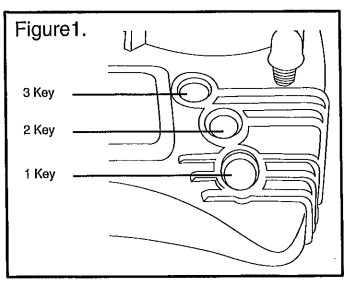
Note: It is very important that you follow the instructions to make sure that the wiring is correct. If you do not wire it correctly the G Cell clock will not work.

1. Take the Clock Module and place the two energy cells in the two holders (See illustration A).
2. Take the black cable and insert the bare wire end into the hole in one of the halves of the plastic contact holder (See illustration B).
3. Wrap the copper wire around the zinc metal (Silver) contact and place it in the slot in the contact holder (See illustration B and C).
4. Take another contact holder and insert the bare wire from the blue cable into the hole.
5. Wrap the bare wire of the blue cable around the copper metal (Gold) contact and place it in the slot of the contact holder.
6. Join the two contact holders together (See illustration D).
7. Attach the contact divider to the ends of the zinc metal (Silver) and copper metal (Gold) contact to stop them touching each other and place the unit into the energy cell (See illustration E).
8. Repeat the process for the other energy cell, start by attaching the blue cable to the zinc metal (Silver) contact.
9. Attach the red cable to the copper contact (Gold) (See illustration F).
10. You are now ready to attach the black cable and red cable to the spring contacts. Black goes on the left and red on the right of the LED Clock Display (See illustration G).
11. Choose a power source to fill the energy cells with. You can experiment with several different liquids to power the clock. Try juice, cola and even coffee!



HOW TO ADJUST THE TIME ON THE CLOCK

1. To set the time press Key 1 (See figure 1) 3 times. The second timer will flash. To adjust the minutes press Key 3 once and the minutes will flash. To change the minutes press Key 2. To adjust the hours press Key 3 once and the hours will flash. To change the hours press Key 2. Make sure that you allow for am or pm on the side. When the time is set, press Key 1.
2. **To set the date:** Press Key 1 (See figure 1) 3 times. The seconds timer will flash. Continue to press Key 3 until you see the date flashing. Then press Key 2 to adjust to the correct date.
   To set the month: Press Key 3 once. You will see the month flashing. Press Key 2 to adjust to the correct month.
   To set the day of the week: Press Key 3 once again to adjust the day the week. You will see the day of the week flashing. Press Key 2 to adjust to the correct day of the week. When all is set, press Key1.



HOW TO USE THE STOPWATCH

Use Key 1 to scroll through the features until you get to the stopwatch function. It'll be set at 00:00 or running quickly. To start/stop the stopwatch press Key 2. To 00:00 the stopwatch press Key 3. To get split time, start the stopwatch by pressing key 2 as explained above. Display the split time by pressing Key 3. The timer will stop displaying but will continue to run in the background. Then press Key 3 again to continue viewing in real time. Now you can press Key 2 to stop. After you are done timing something and the stopwatch is not running, press Key 3 to 00:00 (reset).