



Curiosity Guide #608

Piano Science

Accompanies Curious Crew, Season 6, Episode 8 (#608)

Make a Digital Banana Piano

STEM Challenge

Description

How is a piano like a banana? Find out!

Materials

- 6 bananas
- Makey Makey (a small circuit board that turns physical objects, like a banana, into buttons for your computer)
- Computer
- Alligator clips
- Marker

Procedure

- 1) Open the computer's web browser and go to <http://makeymakey.com/piano/>
- 2) Connect the USB from the Makey Makey to the computer.
- 3) Write on each of the bananas either a directional arrow, the word space, or click. Each symbol will represent a different piano note.
- 4) Connect a green alligator clip to the underside of the Makey Makey that is marked as Earth.
- 5) Attach one end of an alligator clip to the left arrow on the Makey Makey and then press the other end so the metal tip pierces into the tip of the banana.
- 6) Repeat with the remaining 5 clips and bananas.

7) Hold the metal part of the green Earth clip and touch any of the bananas to play a note.

8) Try numbering the bananas to make simple songs.

9) What else may work besides bananas?

10) Would this gadget work with pumpkins? Zucchini? Potatoes? Playdough?

My Results

Explanation

*Have a digital piano available during the explanation to show its similarity to the banana piano.

Mary Had a Little Lamb

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Digital pianos use sensors to play computerized piano recordings through a speaker system. When a key is pressed, the key sends an electronic signal to the piano's computer and plays a recorded sound through the piano's speaker system. Better digital pianos have higher quality recordings of actual pianos and can sense an increasing number of key signals simultaneously.

The banana piano works in a similar way. When you touch a banana with the Earth clip, an electric circuit is initiated. The energy travels from the computer's battery, through the wires, through the water in the bananas, through the person, and back to the computer. Once the circuit is completed, or closed, a sound is produced. The banana piano has six open circuits that close when touched and produce six different sounds. That touch is like the key stroke on an electric piano. The signal goes to the computer, which plays back a prerecorded note through the computer's speaker system.

Think about this. Traditional pianos have been made nearly the same way for hundreds of years. Today, digital pianos are constantly being reengineered. Sound engineers spend a lot of time capturing the best recordings of high-quality traditional pianos played in different ways to increase the number of sounds produced when the digital piano is played. The computer technology keeps improving, too, so the piano action is faster, and the speaker quality is better. Not everyone can afford or have room for a 9-foot grand piano, but with the digital piano improvements, it might sound like you do. Bravo!

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