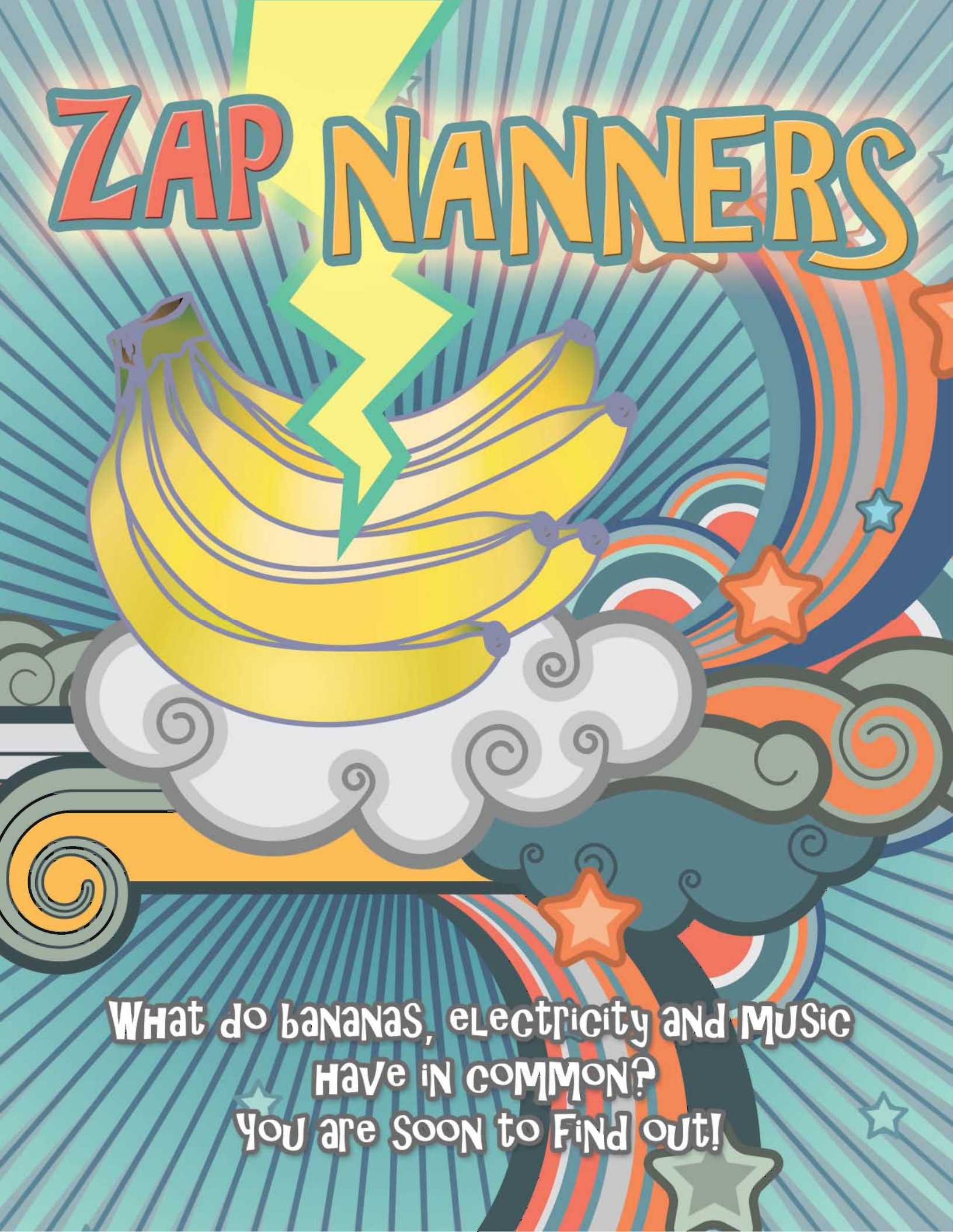
ZAP NANNERS



What do bananas, electricity and music have in common?
You are soon to find out!

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Game Rules

You Will Need:

6 bananas
1 printed banana piano
Clues and materials printed out
Envelopes, tape, paper,
sharpie and pencils
Three controller samples
1 laptop / PC
Internet access
Makey Makey unit
One extra wire for bracelet

Objective of the Game:

This game was intended as a precursor to the study of electric circuits, to inspire inquiry and curiosity about the subject. To develop these activities, we have used Piaget's constructivist concepts, in particular figurative thought and perception. In it, kids will use their minds to make sense of the whole room, which is set like a giant set of puzzles. Ideally, this is a game for small groups of up to five students; however, it can be adapted for more students, depending on resources.

Prior Set Up:

1. Label the bananas with the sharpie: C, D, E, F, G, A
2. Hide the bananas somewhere in the classroom.
3. Turn on laptop; find a free Mario game, and a free piano player.
   http://scratch.mit.edu/projects/2543877/#fullscreen
4. Connect Makey Makey to wires, including ground (extra wire).
5. Attach other end of ground wire to bracelet.
6. Leave screen on piano.
7. Change the password to your computer to ***electricity***
8. Lock your computer. (optional - Place banana piano mat on table)
9. Place the ♫ envelope with the music tune hint taped to the board.
10. Place the controller samples in an envelope.
11. Place hints in labeled envelopes.
12. Print out cover of this rules book and tape to board.

Important Stuff:

To best follow Piaget's theories, ensure that this experiment is done *before* any mention of circuits is made in your Science class.

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Game Rules

Playing the game!

Teaching the class:

1. Student group enters class, where everything has been previously set up.
2. Teacher gives brief instruction: Students are about to start a new unit/concept, and they will find out what it is about through discovery.
3. Students find out that the computer is passworded. Ask if they need a hint.
4. Give them the first envelope, labeled “Hint #1 - Password”
5. If necessary, give them more hints. “Hint #3 - Password” gives the answer.
6. Explain that the concept is related to the password.
7. Students unlock computer, and see the piano.
8. If they seem very confused, tell them to look around the room for something that they think would go with this set up; is there something weird hidden?
9. Students find bananas. Help them connect bananas to piano. Point out bracelet.
10. Wait for them to play with the bananas for a few minutes. Hopefully students will spot the song written on the board.
11. If students don’t see the tune after a few minutes, ask them to look around the room for hints to continue their exploratory adventure.
12. Once students play the tune, congratulate them, and open Mario website.
13. Explain to students that they do not have a controller, and that they need one in order to play the game. Give them a few samples, and let them choose the one they believe would work best.
14. Students enjoy Mario game in turn.
15. After everyone had a turn, give a short lecture about circuits and electricity; end class letting students explore different types of materials and test them for conductivity. Engage students and ask them what they have learned.

Bring Extras --
You Need Bananas until
the End of Class!

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Extra Fun

More...

- If you have time, let students make their own controllers with pencil and paper
- Have a series of extra objects to test for conductivity
- Tie several objects into a giant circuit
- Let students bring things from home to test
- Attach 6 students to Makey Makey,have a seventh student play the piano
- Get more alligator clips and bananas, and play a more complex version of piano
- Ask students to come up with games that use the Makey Makey and circuits

The sky is the limit...

Teach on and Have Fun!

On the next page, you will find a handout designed as an idea of how to present the material to 9th graders.

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Science Bits

The term electric circuit refers to a complete pathway that allows electrons to flow. Typically, electric circuits are connected using conducting wires (eg., copper or metal covered in plastic). The negative electrons are supplied by the battery or power source, and flow through the circuit from the negative end to the positive end. A simple circuit that you all may be familiar with would be a flashlight; it is powered by a battery or cell, connected to a bulb (the light) with conducting wire or metal and has a switch (or button) to turn the light on and off (Figure 1).

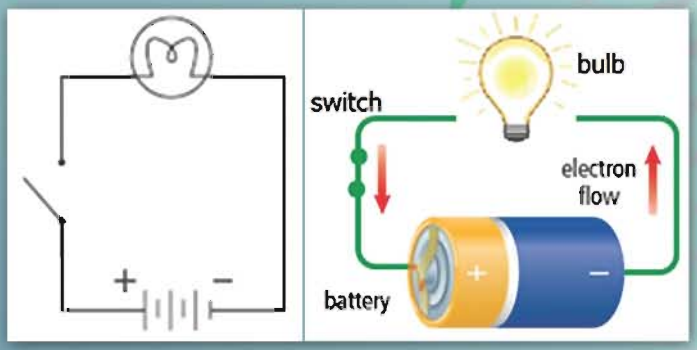
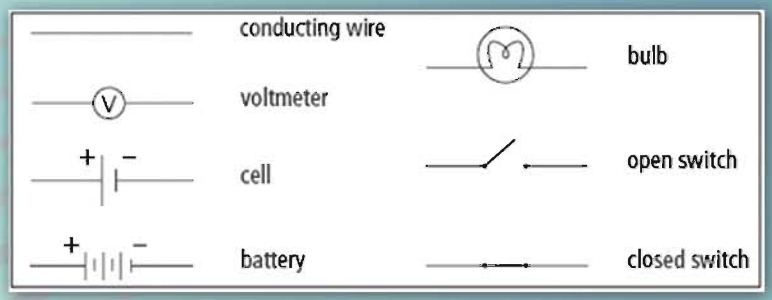


Figure 1: Flashlighgt circuit (right: pictorial, left: symbolic)

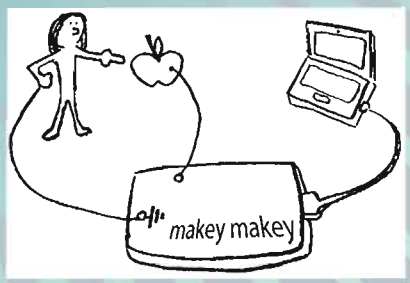
While you were playing this game, you were connected to a circuit. Even better; you were a part of it! Take a moment now to draw yourself within the circuit using the symbols below.



Draw above! What symbol would you use for yourself?

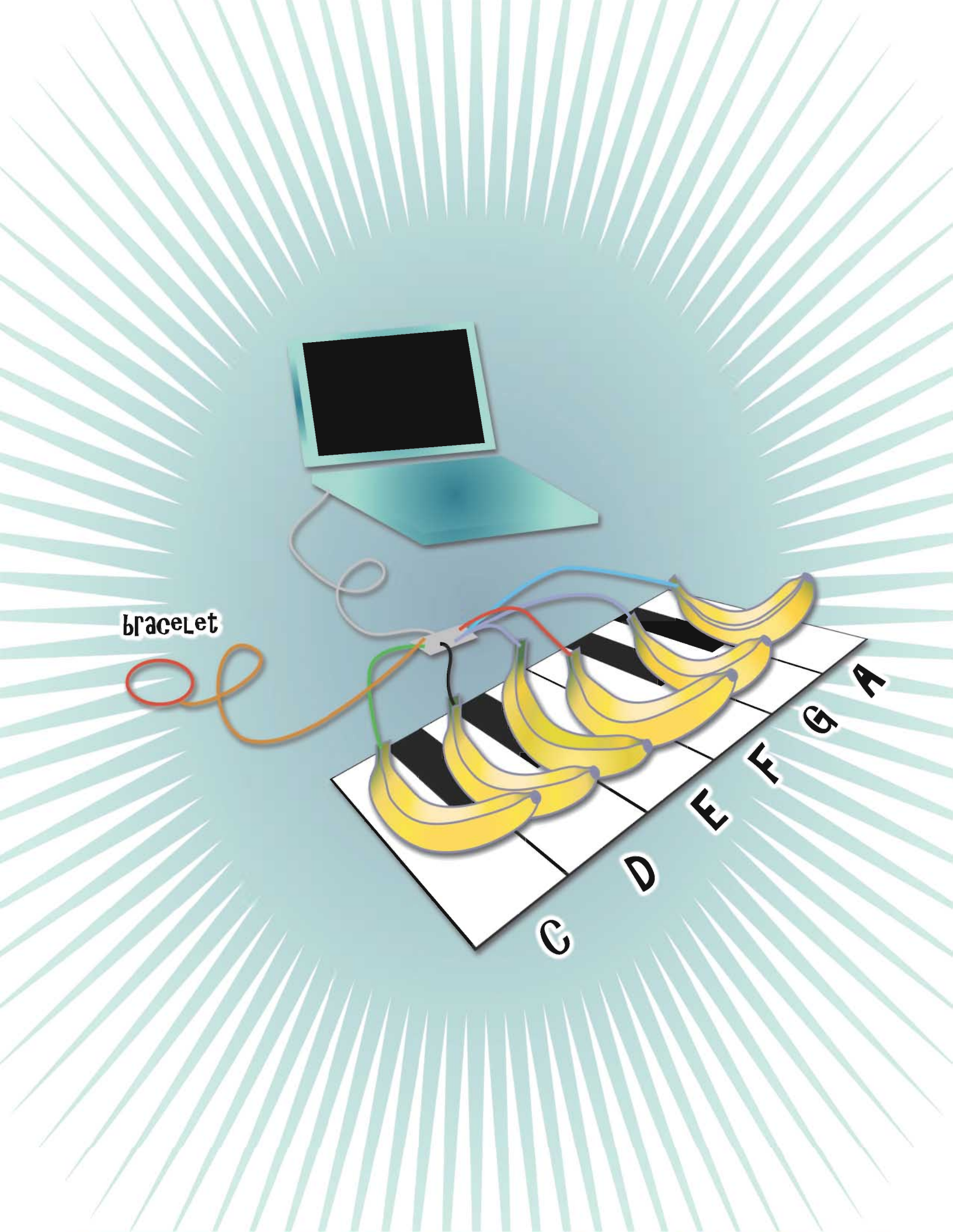
What was the battery in our experiment?

While the Makey Makey is actually a circuit board, we can treat it as a battery or cell in the circuit, because it is attached to a power source (the computer), and because it is responsible for bringing electricity to the circuit. The alligator clips attached to the Makey Makey act as conducting wires. When you attached one alligator clip to yourself, and another to an object, such as the bananas, you effectively turned yourself into an open switch. When you touched the banana, you closed the switch,and caused the circuit to become complete, allowing you to use the banana as a key, just like a mouse click or a space bar on your computer keyboard.



DISCUSS aNd EXPLORE!

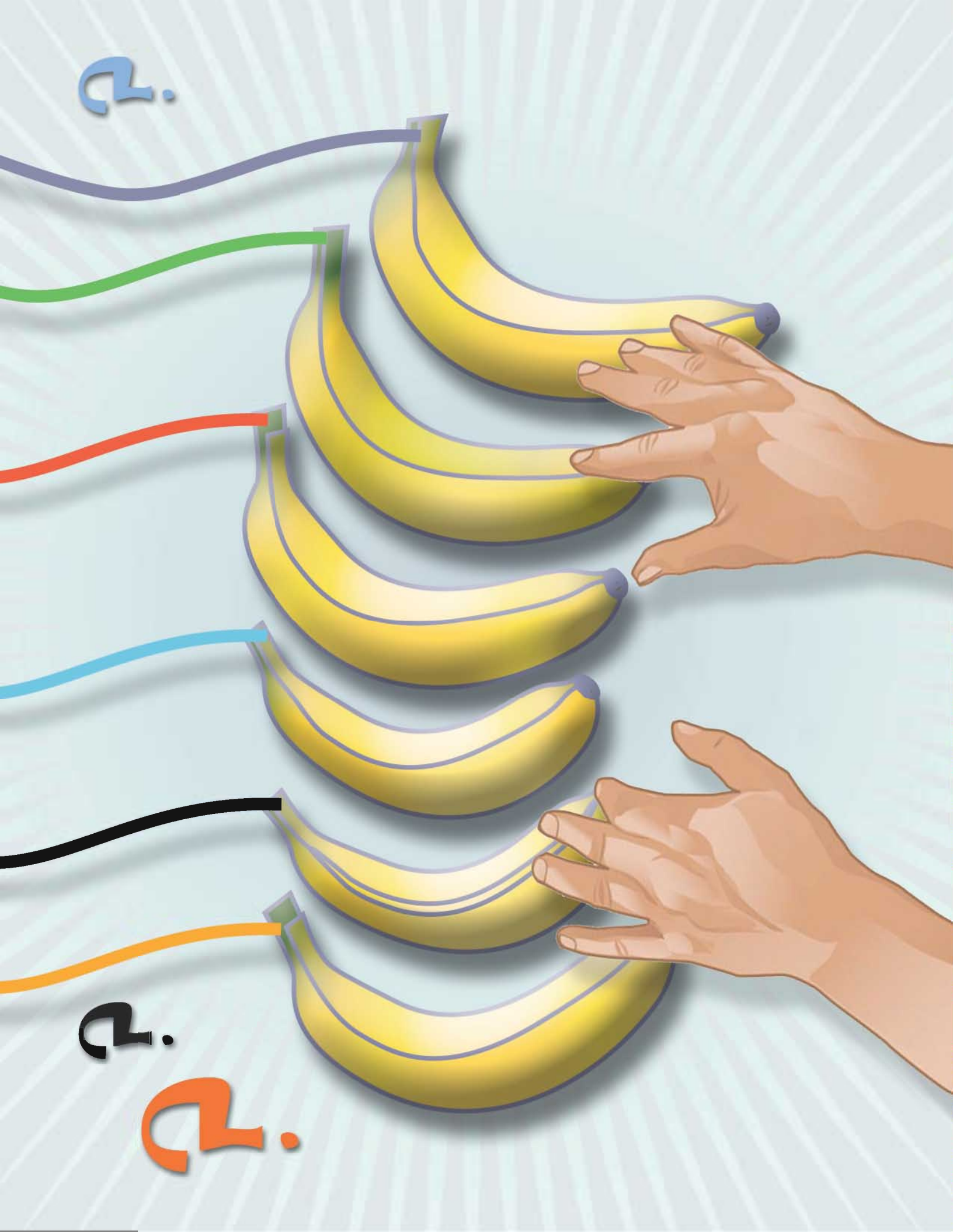
EEECEG


bracelet
C
D
E
F
G
A

_ _ _ _ _ _ _ _ city

Look on poster

electricity



C D E F G A

To simplify things, label each alligator clip with the letters above. Use the rest of this page's resources to label envelopes and complete your game.

You can tape this mushroom to the top of the monitor as a fun hint of the game to come.