



# WAYNE STATE UNIVERSITY

## STEM Day Lesson Plan

**Title:** “Invent Tech: Makey Makey”

**Subject Area:** Technology

**Learning Activity Description:** Students plug the Makey Makey board into a computer USB port, and using alligator clip wires, they turn conductive materials (food/play-doh/metals) into keys that respond as the keyboard to the computer. Using interactive websites students can then play games, or on-screen instruments using these conductive material “keyboards” (i.e. bananas become a piano; play-doh can be formed into arrow shapes and used as a game controller). Grounding bracelets are created so that students don’t have to hold onto one end of a wire to complete the Makey Makey circuit.

**Lesson Activity Objective:** To introduce students to circuitry as it relates to computers. They also learn basic concepts of completing circuits, and the importance of “grounding”.

**Lesson Activity Outcomes:** Students will understand circuitry and the way circuits and circuit boards interact with a computer.

### Materials/Supplies Listed:

1. Makey Makey board (can be found on Amazon).
2. Conductive materials: anything you want, some examples: tin foil, jewelry wire, paper clips, binder clips, play-doh, pencil etchings (*draw and color something with graphite on paper, and connect a wire to the drawing*), conductive tape (*copper tape*), fruits and vegetables (*mini bell peppers, bananas, celery, squash*).
3. Some type of wire to create grounding bracelets (we used glow stick bracelets and had students wrap tinfoil around them. Using jewelry wire would work as well.)

### Teacher Procedures:

1. Set up Makey Makey boards at computers. (plug Makey Makey into USB port on computer).
2. Navigate to an interactive website, or YouTube video about Makey Makeys to introduce students to the activity.
3. Pass out materials to make grounding bracelets.
4. Walk students through making different objects “work” as the keyboard/ talk about why they’re working (conductive material, grounded by the grounding bracelet, complete circuit, etc.)

**Preparation Time for Learning Activity:** 10- 15 minutes (Getting Makey Makeys set up and passing out conductive materials).

**Room set-up:** Any room with computers and space for students to work around the computer in groups of 2-4.

**Group Strategies (example, group size, expected time for groups, etc.):** Groups of 2-4 students work best, that way they can collaborate and share ideas, but also there's a small enough number such that each student in the group gets to try out the Makey Makey.

**Student Products/Artifacts/work pages:**

1. Introduction video (talks briefly about what the Makey Makey is and demonstrates some creative ways to use it ~3 minutes long): <https://www.youtube.com/watch?v=rfQqh7iCcOU>
2. Games that can be played using "conductive object keyboards" made with the Makey Makey: <https://scratch.mit.edu/studios/3463068/>
3. The Makey Makey itself (Amazon): <https://www.amazon.com/Makey-Invention-Kit-Everyone/dp/B008SFLEPE>

**Assessment Criteria/Rubric:** Ask students to explain circuitry, the importance of "grounding" and completing a circuit.

**Closing/Transition to next activity:** This would be a good, fun lesson to refer back to when moving further into circuits and talking about complete circuits. This would also be a good lesson to end a unit on circuitry as it will help students to see the concepts they've just learned about in action on things that are very real and commonplace to them (computers, video games, on-screen interactive instruments).

# Invent Tech: Makey Makey STEM Day Activity Procedure

## Materials

Makey Makey board

Alligator clip wires

Conductive materials (pencils, fruits, vegetables, tin foil, etc.)

Glowstick bracelets

## Directions

### Setup:

- 1) Plug the Makey Makey in to the USB port located on the back of the computer. Connect up to 5 alligator clip wires to the "arrow keys" and "space bar" located on the Makey Makey.
- 2) Create a "grounding" bracelet by wrapping aluminum foil around a glowstick bracelet.

### The Fun Part:

Create your new "keyboard" with anything that's even slightly conductive. Pencil etchings, Play-Doh, bananas, wired shapes, etc.

- 3) Connect the unconnected ends of the alligator clip wires from step 1, to any of your conductive materials.
- 4) Power it up! Take an unused alligator clip wire and connect one end to "Earth" at the bottom of the Makey Makey board and the other end to the grounding bracelet on your wrist.
- 5) Your "keyboard" is ready to use! Try it out by tapping on the conductive materials with your fingers.
- 6) Type in this URL and click on any of the games to test out your new keyboard! Snap pictures of your creation and share using #WSUSTEM!

<https://scratch.mit.edu/studios/3463068/>

