# Introduction to the Makey Makey Kit

Note: The print resources in this binder are also available as electronic files on the kit's flash-drive. Due to the dynamic nature of the product, please explore online for further/updated information using the links & search suggestions provided.

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**1. What is it?**

https://www.youtube.com/watch?v=rfQqh7iCcOU

"MaKey MaKey is an invention kit for the 21st century. Turn everyday objects into touchpads and combine them with the internet. It's a simple Invention Kit for Beginners and Experts doing art, engineering, and everything in between." Want to see more? Check out the this gallery of projects using Makey Makey:
http://makeymakey.com/gallery/

**2. How does it work?**

https://www.youtube.com/watch?v=5QAdBBgyTjo

"Alligator Clip two objects to the MaKey MaKey board. For example, you and a banana.
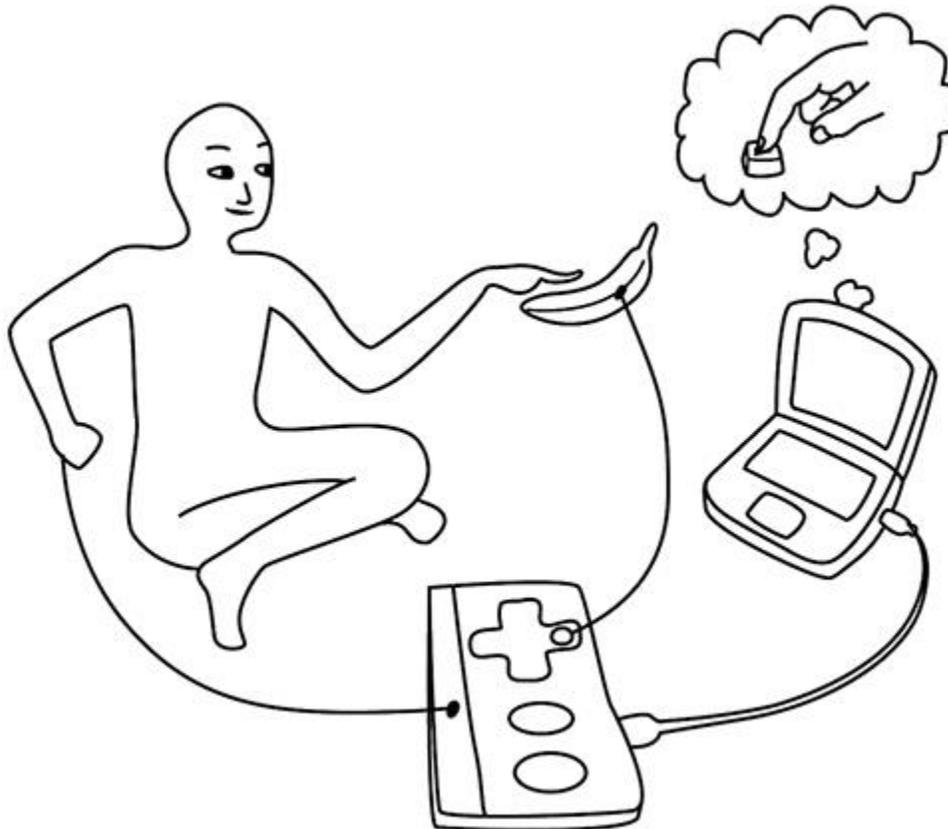
When you touch the banana, you make a connection, and MaKey MaKey sends the computer a keyboard message. The computer just thinks MaKey MaKey is a regular keyboard (or mouse). Therefore it works with all programs and webpages, because all programs and webpages take keyboard and mouse input."

## 3. Are there instructions?

There are basic instructions inside the box of each Makey Makey. Those instructions have brief information on "how to use it", "ideas to get you going" and "help" (including troubleshooting). All of this information and more is also available online

http://makeymakey.com/howto.php basic instructions - "quick start guide"

## 4. I don't have time for complex – what is the simplest project?

There are premade projects on Makeymakey.com like the piano or bongos. The links to those projects are on the http://makeymakey.com/howto.php page or and on the simple instructions included in the Makey Makey boxes. Here is a brief teacher-created video demonstrating the ease of these projects:

https://www.youtube.com/watch?v=5QAdBBgyTjo

And blog entry about a library program using the basic piano:

http://nevershushed.com/2014/07/19/maker-monday-electricity/

## 5. What's with the bananas?

Part of the fun of Makey Makey is that you can turn any conductive object into a keyboard key. Bananas are a popular choice because they are nice and moist, so nice and conductive! Experimenting with various objects to find out if they are conductive or not, can be part of the fun for your class. Gummy worms, mini-bell peppers, coins, aluminum foils, water (see some examples online- clearly avoid immersing the Makey Makey ☺), copper tape, carrots… your imagination is the limit!

## 6. Wait, what? Completing a circuit with my body? Is that safe?

These Makey Makey kits were purchased from JoyLabz. Here is information from their website about the product:

Makey Makey is very safe. For example, we see a lot of Makey Makey projects that involve water, and as we all know, water and electricity do not mix -- in many situations this combination is an absolute no-no. Makey Makey is different because it is powered by a USB connection, not AC current. The voltage is similar to that provided by 3 AA batteries (or in technical terms, 50 microamps); enough electricity to have a lot of fun, but not enough to do any harm. Another thing to note is that we experience more electrical charge with normal daily activities like walking on carpet or wearing polyester clothing. Lastly, Makey Makey uses resistive touch sensing that is present in many consumer electronic products and is FCC compliant.

Here are some considerations to follow when using Makey Makey:

- Makey Makey should be used according to its intended use via the USB cable

provided to a USB compliant port.
- Never connect Makey Makey to an AC outlet.
- If product is damaged or broken, please discontinue use and contact Makey Makey support. *(in this case – Rio Rancho Libraries)*

**7.  I'm ready for a little more hands-on creativity – what's next?**
Even using the simplest program such as the six-note piano at www.MakeyMakey.com/piano  you can challenge your students to create their own "keyboard" that can be "played" in creative ways.  Remember the big keyboard in the movie "Big"?  Your students can create switches or dance-pads using cardboard & aluminum foil (how?  Look here for more info… http://pbskids.org/designsquad/parentseducators/resources/dance_pad_mania.html ) or any number of creative solutions.  Here is a wonderful video of what you can create…https://www.youtube.com/watch?v=rfQqh7iCcOU

**8.  I'm ready for some more challenging tech for my class – what's next?**

    **a.  Drag & Drop Programming with Scratch**
    While the 6 note piano is fun, by using this programming tool you can change piano notes to be anything you want from cat meow's to game controlling move.  It may sound intimidating at first, but it is a really user-friendly tool and kids tend to pick it up very quickly.  I've used it with kids 8-12 years old, as well as teens.  All were successful in creating things they wanted to create!

    Scratch is a free drag and drop programming tool for kids.  It was developed by MIT, and is free to use online https://scratch.mit.edu/ and can be downloaded to a computer https://scratch.mit.edu/scratch2download/   There are wonderful guides and learning tools on the Scratch website so I will not repeat them here.

    I like to introduce the combination of Scratch & Makey Makey by downloading the "Makey Makey Piano 2" project to my account, and letting children make changes to that program. A next challenge might be to add some graphics – for example "make something move when a note is played."

    If your students have used Scratch before, they will quickly catch on to creating their own projects using the Makey Makey.  If they have not, just being able to easily change the sound of a piano key to a drum (for example) is often inspiration enough to explore further and see what else they can change! Eventually they create their own game or instrument  or animation on Scratch and can use the Makey Makey as the controller.

Here are some links for inspiration:

https://www.youtube.com/watch?v=HRVxUgWHlNs   Makey Makey & Scratch – child created a game and game controller

https://www.youtube.com/watch?v=5CZ2hb0C6sk   Makey Makey & Scratch – 5th graders used Scratch and Makey Makey to teach a lesson about circuits

http://showmelibrarian.blogspot.com/2014/06/creating-computer-games-with-makey.html  Makey Makey & Scratch – a blog post about 9-12 year old kids creating their own games on Scratch and controllers with Makey Makeys.


b. **More wires!**

Turn the Makey Makey over… there are wire terminals on the back too!  Let your class make bigger pianos or a whole band!  Again, the limits are your imagination!  "Makey Makey can press as many keys as your keyboard allows at once, which is 6. You can use up to 18 in a session (6 on the front of Makey Makey and 12 on the back), but only 6 can be held down simultaneously."

You many need to purchase some additional wire if your class will be using all the terminals.  If you don't have access to wire but would to do this, please contact Youth Services and we may be able to provide the materials.


c. **Online Lesson Plans & Guides (mostly for grades 5+)**
There are lesson plans with more extensive activities and "standards" identified for the activities here:

http://makeymakey.com/lessons/ Lesson Plans (most for grades 5+)

And some rather involved projects here as well:

http://makeymakey.com/guides/ Group activity guides



9. **I want to tie-in to other parts of my curriculum… options?**

   **STEM ideas:**

Electricity – teach the basics about electricity.  The library has quite a few books and some DVDs about electricity and circuits.  There are of course numerous online resources as well… Bill Nye is always a favorite!

https://www.youtube.com/watch?v=gixkpsrxk4Y Bill Nye the Science Guy: Electricity (6:49)

Here is a favorite activity of mine for teaching about electricity/circuits: Activity:  pass small beanbags (or whatever object) from person to person in a circle.   The beanbags represent electrons flowing from atom to atom (the people represent the atoms) inside of a conductor (wire).  When one hand is raised (no place for the beanbag to go) that is like turning off a switch in the circuit.  You can assign different students to represent different electrically powered objects like a radio (have them sing when they are "on"), a buzzer, a motor (spinning arms), etc…

More on Circuits

https://www.youtube.com/watch?v=VnnpLaKsqGU simple explanation of a circuit (2:27)

https://www.youtube.com/watch?v=3kyntGqT14s       demonstration      of conductors and insulators (2:52)

**Scratch drag & drop programming**
By using Scratch students can create interactive animations, presentations, games, etc… based on any subject.  Studying recycling?  History?  Math concepts?  Outer space?  Have the kids invent a game or animation about it!

**10. This is all too easy for my students… where's the beef?**

This guide  https://learn.sparkfun.com/tutorials/makey-makey-advanced-guide takes you to new levels using Arduino coding and also introducing the "output header" portion of the Makey Makey.  Please note that the Makey Makeys in the kit were not purchased from SparkFun, but from Joylabz.  This means some of the information won't work as stated… but you can search the internet for work-arounds.  Here are instructions based on my experiences reprogramming a JoyLabz Makey Makey:

- Use the pdf advanced Makey Makey guide
- Note that there are a fair number of software downloads to accomplish this, so don't try to do it in a hurry!

- NOTE:  if the Makey Makey is purchased from another source than SparkFun it may show up as a Arduino Leonardo rather than a Makey Makey in the device manager on your computer.  If this happens, you will need to force your computer to recognize the device properly before the program will upload from Arduino IDE to your Makey Makey.  There is a pdf file on the flash-drive (the "printed" comments from the advanced guide from SparkFun) that addresses this issue.  It is a little awkward, requiring quickly clicking on the device and uploading the driver but works after a few tries!

**NOTE:**  if you have your students reprogram the Makey Makeys, please also have them return the programming to the original state before returning the kits to the library – thank you!

**11. I did something really cool with this and want to share!**
Wonderful!  Please add your document/video/pictures whatever you want to share onto the kit's flash-drive inside the "Rio Rancho Educator Sharing" folder. Please add a subfolder if you have several files.  Please include your school name, your name, and the grade level you teach in the items you share.  Thank you!