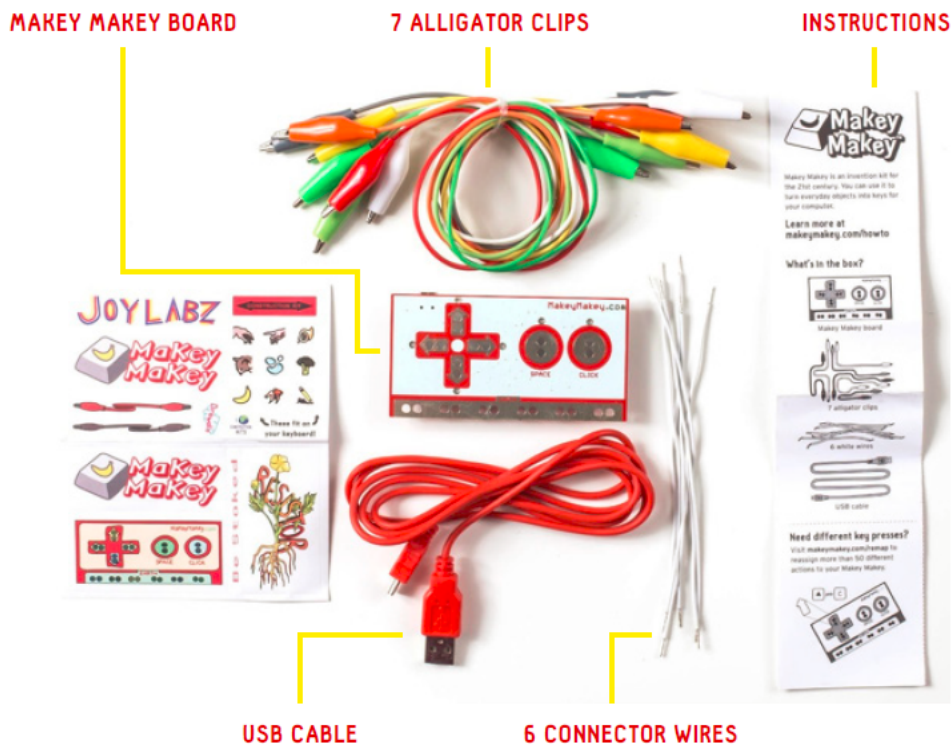


Tangible computing with Makey Makey

Summary: Makey Makey is an invention kit for the 21st century that ignites curiosity, challenges problem-solving ability, and fosters creativity. With Makey Makey everyday objects are transformed into touchpads empowering students to interact with computers as creative tools. The computer becomes an extension of their creativity, fostering imaginative play and discovery.



In this activity, you and your students will create innovative game controllers out of fruits, cutlery, tin foil and so on. Imagine playing the classic PacMan with a set of spoons or a piano made out of bananas and apples. This is the ultimate creative exercise, connecting the real, tangible world with digital coding.

Timeframe: 60 minutes

Learning outcomes:

- | | |
|----------------------------------------|-----------------------------------------|
| 1.1 Algorithms | 3.2 Negotiation practices |
| 1.2 Sequences | 3.3 Describing thought processes |
| 1.3 Repetition and loops | 3.4 Learning from vicarious experiences |
| 1.4 Events and selection | 4.1 Combination |
| 1.6 Conditionals and logical operators | 4.2 Exploration |
| 1.7 Mathematical operators | 4.3 Transformation |
| 2.1 Incremental & iterative work | 5.1 Problem identification |
| 2.2 Testing and debugging | 5.2 ideation and brainstorming |

2.3 Reusing and Remixing

2.4 Abstraction

2.5 Modularization

2.4 Information: collection & management

3.1 Working together

5.3 Implementation

5.4 Evaluation & reflection

5.5 Iteration

Implementation:

Introduction:

You can introduce the MakeyMakey controller with a short video showing its possibilities, or with a small example performance. You can find a clear, well explained video on YouTube by following this link: <http://bit.ly/intro-makey>

The other way to introduce the MakeyMakey, is by connecting it to a computer through USB, running a Scratch algorithm that makes a sound whenever you press a button. Connect the ground cable to the Makey Makey (explained in Worksheet 4) and also a cable to the spacebar slot. Make sure the volume is turned up.

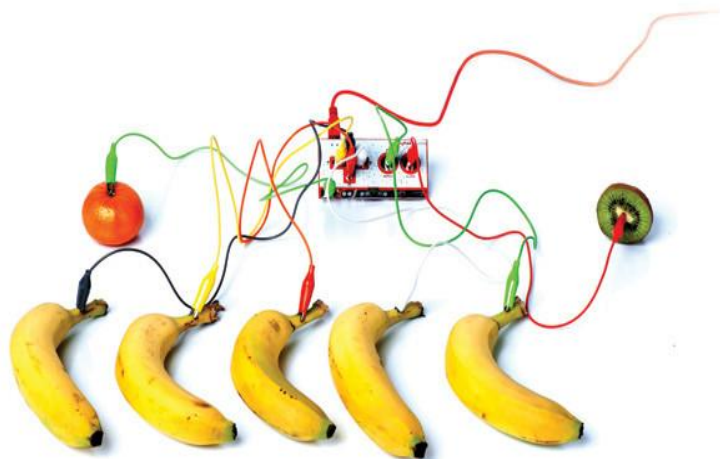
You, the teacher, hold the ground cable, while a student takes hold of the spacebar cable. All the students and you make a circle, holding hands except the last person (who is holding the cable). Have the two students -that are not holding hands- high five each other. A sound will ring on the computer. Have them try high fiving at different points in the circle.

Testing games with the Makey Makey

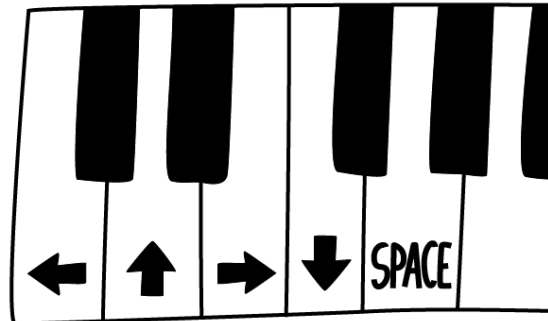
Set up your computers, each with a (different) app on it that is compatible with the Makey Makey. You can also use retro games, that you can find online, such as PacMan or Super Mario, or most Scratch games.

With each computer, there is a Makey Makey set (not yet connected), an instruction sheet on how to connect it and some objects that conduct electricity.

The students split up, spreading out across the different computers, so they can set up the Makey Makey devices and test the first game or application. After about 15 minutes, they rotate to the next game. From now on, every 10 minutes, they move up again one activity.



Here, you can see the classic "Banana Piano", but there are many more ideas and existing games. Take a look at <https://labz.makeymakey.com/d/> for inspiration and choose the ones you like best.



Warning: the game will only work if the player is holding the grounding cable (and touching the metal end). This is because Makey Makey uses an 'electrical' circuit for transferring information and those circuits always need to be closed. Don't tell your students in advance: let them figure it out while experimenting.

Tips & Tricks:

- Continuously holding the ground can be difficult sometimes, especially when playing a fast, more complicated game like PacMan. Try making a (tight) bracelet out of tinfoil, connecting it to the ground cable and let the student wear it on his or her skin.
- If you feel like you need a more extensive video, explaining how to use a Makey Makey, you can take a look here: https://www.youtube.com/watch?v=-X3hb_YynM
- Makey Makey offers a lot of tools and resources for teachers, such as their Educators Guide (https://makeymakey.com/education/Makey_Makey_Educators_Guide.pdf) and Lesson Plans (<https://makeymakey.com/lessons/lesson-plans.pdf>)
- Looking for more inspiration? Take a look at what other teachers and students are creating at <https://labz.makeymakey.com/>.

Materials:

- 10 or more computers / laptops
- 10 or more Makey Makey kits
- Assortment of materials that conduct electricity, for example
 - Bananas, apples, oranges ...
 - Tin foil, aluminium or copper tape
 - Plasticine or modeling clay
 - Metal spoons and forks