# User Manual

## Materials/Supplies

### Necessary:

* Capacitive Keyboard in box
* Speaker
* 12 fruits/ conductive materials + some extras for more fun times!
* Paper Towels

### Fun Extras:

* Wooden dowel
* Metal Cup 🡪 put water in the metal cup, can tap the cup or the water inside!
* Sodium Polyacrylate 🡪 turns the water into sludge, reduces chance of spills

## Set Up

* Stab the unused end of each pin into a conductive material
* Connect the audio speaker (insert into audio jack)
* Flip the battery rocker switch (back of box) from the OFF position to the ON position
* Make sure that you turn on the keyboard AFTER stabbing the unused end of each pin into the different materials
* Red LED on Teensy board should be on and flashing

## During Use and Trouble Shooting

* Each pin is its own unique note.
* When the keyboard is started it is in its first mode: piano
* To change modes, press the black button on the side of the box
* Whenever a pin is touched a LED on the MPR121 board should blink red and a sound should be heard
* About every half hour try to put the materials back into some kind of order / tidy up the space

### If a fruit stops working/playing a note when tapped:

* Make sure the end of the clip is fully inserted into the fruit
* If the issue is still not resolved flip the battery switch OFF and then ON again
* Tap each fruit and see if the problem is resolved
* Tap the problematic fruit and check if it now makes a sound
* This is normally a problem with lemons and limes after they have been heavily tapped

### Other Issues:

* If the red LED on the Teensy board does not turn on, the battery has run out, please replace the batteries
* **In general, the solution to most problems with this Demo is just to flip the battery switch OFF and then ON again**

## Clean Up

* First slide the battery switch to the OFF position and unplug the speaker
* Remove all the fruit from the pins
* Wipe down/clean the pins (removing any fruit gunk left over from the day’s use)

### Facilitation Fun!

* Use a wooden dowel to explore the difference between insulating and conducting materials
* Leave extra fruits out as explorers are very keen to move around pins
* Please don’t leave out just water in a cup as there are high chances of spills 🡪 mix in sodium polyacrylate to make sludge that won’t spill
* Let explorers tap the outside of the metal cup, the inside of the metal cup, and the sludge inside
* Grapes should not be used with this demo 🡪 many will stick them directly into their mouths. Conversely, brussel spouts are wonderful for this demo!
* Let explorers tap just the metal end of the wire to produce a sound
* A really great way to explain what’s happening is to mention how our hearts beat because of electrical impulses. The electricity travels from us through the conductive material, into the metal tip and up the wire.
* Encourage stabbing one material with two wires 🡪 this completes the circuit and makes a continuous sound
* Encourage touching the metal ends of the wires together
* Most explorers will want to move around pins, stab other fruit and all around push the demo as far as they can with repeated tapping. This is awesome! Encourage them to explore as they want to with some prompts. If the demo ever stops working just reset it with the battery switch!