

# ShrimpKey: Conductive Keyboard

This project demonstrates how to build a substitute for the MakeyMakey USB conductive keyboard.

Because it is constructed directly from component parts, it is cheaper and arguably more educational than a MakeyMakey. You can build the project by combining a [Shrimp](#) with a handful of resistors and diodes, a hacked USB cable and some jumper wires or crocodile clips.

## Learning Outcomes

This project introduces the concept of a [voltage divider](#). It demonstrates how a [pull up resistor](#) ensures an unambiguous signal from a voltage divider circuit.

From this starting point, advanced learners will be able to create their own button keypads, use [potentiometers](#) to control circuit behaviour, sense light levels using [Light Dependent Resistors](#), Temperature and Acceleration Sensors using these key principles of analog electronics.

It also demonstrates the fundamentals of the [Universal Serial Bus](#) (USB). The circuit appears to laptops or tablets as a USB keyboard. The circuit proves that with just 2 wires connected and controlled in a suitable way, (plus power and ground wires) it's possible to emulate a device conforming to the USB Human Interface Device (HID) keyboard standard. Advanced learners will experiment with emulating different USB devices.

## Build Process

As with all [\[@ShrimpingIt\]\(http://shrimping.it\)](#) projects, the build should begin by following the instructions to [build and program Blink](#).

Once your Shrimp is blinking, you can then proceed through the following builds...

- 1) Minimal Conductive Sensor
- 2) Minimal USB Keyboard
  - add the minimum components for the circuit to be able to emulate a [USB keyboard](#).
  - upload code so that the circuit 'types' the phrase **Hello World!** every 10 seconds.
  - plug the hacked USB cable into a computer, launch a suitable application, and see the typing appear on the screen

### 3) Minimal Conductive USB Keyboard

- add a single [pull up resistor](#) a ground wire and a contact wire
- Upload code which senses a human body making a circuit between the ground wire and the contact wire causes the USB Keyboard to ‘type’ the number 1
- plug the USB cable into a computer, launch a suitable application, and see the typing appear on the screen

### 4) ShrimpKey: Full Conductive Keyboard

- add the remaining 15 [pull up resistors](#) to create a total of 16 conductive sensors, making it possible to create compelling interactive demonstrations like the MakeyMakey demos below.