Getting started with MaKey MaKey
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MaKey MaKey is an invention or prototyping kit.
It allows you to turn everyday objects into an interface with a computer, replacing the keyboard and mouse. Anything that is conductive can now become a keyboard.
The sorts of things that work are:
• Most fruit and vegetables
• Other foods like marshmallows, gummy lollies (good for making applications that require people to eat to interact!), cheese, cupcakes and drinks
• Plants may work through their leaves and flowers
• Play-Doh, Tinkers Dough (available from Big W) and some modelling clays
• People!!!
• Pencil lines and drawings on paper - make sure you use a soft black pencil such as a 2B or 4B
• Aluminium foil, coins, metal cutlery, nuts and bolts and other metal objects
• Water!!!
Try using other objects with things that are conductive. Balloons can be really interesting!
By itself, the MaKey MaKey can be used to create interesting interactions with existing software. Combine it with actionscript or another programming language and you have a very wide range of possibilities for fun and interesting physical applications.
In this project, we are going to introduce you to setting up the MaKey MaKey by creating a play-doh game controller for Space Invaders.

What you need
- A MaKey Makey
- The connector cable
- 4 alligator clip cables
- Play-doh
- Aluminium foil
- A rubber band

Go into this website to play a free on-line version of Space Invaders:

[freeinvaders.org](http://freeinvaders.org)

**Step 1**
Make two triangles and a ball from the Play-Doh. Set them up on the desk for left direction, right direction and bullet fire.

**Step 2**
Connect the alligator cables to:
1. Left arrow
2. Right arrow
3. Space
4. Earth (use black for this one)

**Step 3**
Push the alligator cables into the Play-Doh objects - Left direction into the left triangle etc.

The earth or black cable, you just hold on to as you will be using your body to complete the circuit.
Step 4

Plug the small end of the connector cable into the MaKey MaKey and the USB into your computer.

You should see some light flash on the MaKey Makey.

If you get a dialog box appear on your computer asking you to install drivers, just close it.

Step 5

Start playing! Start the Space Invaders game using the keyboard. Once this is done you can start playing using your Play-Doh controller.

Make sure you hold onto the alligator clip on the black wire!

Step 6

To make things easier, you can create a wrist band out of the foil and elastic band. Wrap this around your wrist and clip the earth (black) cable onto the foil. This will allow you to interact with both hands!
Project 2: Group Selfie

This is your first challenge - creating an interesting way to get a group of people interacting physically in order to take a selfie.

For your first inspiration, check out the Duracell Moments of Warmth video on YouTube.

Open up the website for webcam toy:

http://webcamtoy.com/

This is the application that we’ll use to take the selfie. You could just as easily use any photo application on your computer.

Step 1

Work out how webcamtoy works. What button needs to be pressed for a photo to be taken? How are you going to get that button to be pressed using the MaKey MaKey?

Step 2

Design your interaction.

What interesting actions can you get people to do in order to take a photo?

Think about whether you can create something wearable to be part of your design.

Step 3

Build your application!

For further ideas and inspiration, go to makeymakey.com and look under How-To and Projects
MaKey MaKey 2: more inputs

To use the additional inputs you will need additional software and/or programming knowledge.

There are additional inputs on the rear of the MaKey MaKey.

On the right side are inputs for up, down, left, right, left mouse click and right mouse click.

On the left side of the MaKey MaKey there are inputs for the letters W, A, S, D, F and G.

This gives you 12 inputs available for you to use.

These inputs do not use the alligator clip cables, but rather the connector wires - the wires with pins on the end.

At the bottom of the board are ‘headers’ that can be used as earth with the connector wires.

Similar inputs as the front - up, down, left, right, left mouse click and right mouse click

Inputs for keys W, A, S, D, F and G
Project 3: Group Selfie using Actionscript

You may be familiar with the Adobe software called Flash. This software allows you to program using Actionscript 3.0.

Actionscript 3.0 is quite a powerful programming language with its syntax quite similar to languages such as javascript.

It is object-oriented so it is a great platform for students to learn some basic programming.

Using actionscript 3.0 with the MaKey MaKey allows you and your students to develop their own games and applications with interesting interactions.

IMPORTANT
When searching online for actionscript resources, make sure that you search specifically for Actionscript 3.0. Actionscript 2.0 is still around but is pretty much a dead language.

Getting start with Actionscript
One of the best series of tutorials to learn Actionscript is on code.tutsplus.com.
This series is excellent:
http://code.tutsplus.com/series/as3-101--active-7395

We have created a sample program for a photobooth in Actionscript.
Within the code we have added comments to help guide you through what the code does. It also has two options around the interaction to take a photograph.
The first option uses a mouseclick. So when building your physical interaction, all you need to do is create something that uses the MaKey MaKey mouse click.
The second option checks for a key pressed on the keyboard. Pressing the letter ‘F’ will cause the selfie to be taken. You can use the MaKey MaKey to create alternatives to using the keyboard. Getting people into strange or awkward positions and taking photos of them is always fun!

Within the code we have added comments to help you understand that code and to help you make changes.
package {

    // these statements import libraries that are used in this program
    // they provide you with pre-programmed functions that you can use
    // they save you lots of time

    import flash.display.MovieClip;
    import flash.media.Camera;
    import flash.media.Video;

    import flash.display.Bitmap;
    import flash.display.BitmapData;

    import flash.events.MouseEvent;
    import flash.events.KeyboardEvent;

    // this is where your program is written
    public class WebcamVideoHelper extends MovieClip {

        // if you are going to need variables that are used in all parts of your program
        // you define them here (global variables)

        // and this is the main part of your program
        public function WebcamVideoHelper() {

            // access the web cam for the computer
            var camera:Camera = Camera.getCamera();
            camera.setMode(300, 200, 30, false); // setMode (width, height, frames per second, favor area)

            // get the webcam video and play it on the stage
            var webcamVideo = new Video(camera.width, camera.height);
            webcamVideo.x = 20; // these two lines set the position of the video
            webcamVideo.y = 80;
            webcamVideo.attachCamera(camera);
            addChild(webcamVideo);

            // draw the still image from the video
            var selfieData:BitmapData = new BitmapData(camera.width, camera.height);

        }
    }
}
function takeSelfie(event:MouseEvent):void {
    selfieData.draw(webcamVideo);
}

function takeSelfie2(event:KeyboardEvent):void {
    highlightCamera();
    var keyPressed = String.fromCharCode(event.keyCode);
    if (keyPressed == 'F') {
        // the input from the keyboard is in ascii format - so it’s a number
        // this line converts the ascii number back into the letter that has
        // been pressed
        var keyPressed = String.fromCharCode(event.keyCode);
    }
}
// trace simply outputs information into the console
// it's great to help you debug a program
// this line outputs the letter that has been pressed
trace(keyPressed);

// a switch statement is like an if-else statement
// just a little shorter to write :-)
switch (keyPressed) {
    case 'A':
        trace("Wrong key pressed");
        break;

    case 'F':
        trace("That's it!");
        selfieData.draw(webcamVideo);
        break;

    case 'S':
        trace("Not this one");
        break;

    default:
        break;
} // end switch

} // end funct takeSelfie2

} // end funct takeSelfie2

} // end funct takeSelfie2

} // end funct takeSelfie2

}
Additional resources

**makeymakey.com**
In particular look at the pages for Projects, Guides and How-To. There are great videos on each of these pages to help you with inspirations.

Most helpfully, they also list some online applications that you can design interactions around. For example, you can create PianoStairs without having to do any coding.

**YouTube**
Search ‘Makey Makey’ on YouTube to get more examples of projects.

**tuts+**
This website has a great tutorial on getting started with actionscript. The series around actionscript 3.0 is a valuable resource. And it’s the sort of thing you keep going back to.

**StackOverflow**
If you get errors that you don’t understand, stackoverflow often has the answers. Chances are someone out there has had the same problem you are facing and someone else has provided an answer.