

Etude 1: Explore

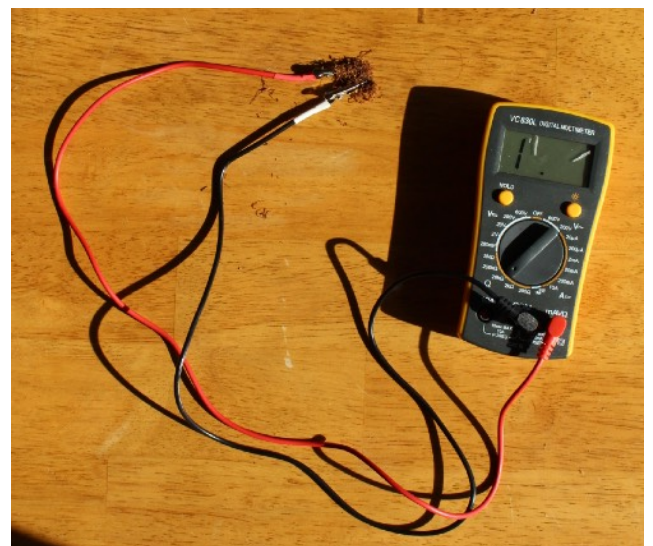
Ruth Johnstone

Material 1 - Tobacco

The first object I have chosen is tobacco. I chose this because it is something I put in my body nearly every day and I honestly wasn't sure about its conductive abilities. Tobacco is a moist but fibrous material which usually is packaged in clumps but can be pulled apart to become less dense (or compressed to become dense again). It is designed to be moulded into different shapes for different uses; typically a sausage shape for those rolling into a cigarette or a more rounded shape for those using a pipe. It comes in varying shades of reddish/amber brown and has a distinct smell that varies slightly from brand to brand. I was really unsure of the conductive potential because to touch, I wouldn't expect it to conduct but my prior knowledge of it is that it contains tar, which I know conducts electricity because it contains carbon black. However, I was skeptical as to whether this would be applicable since I suspected that tobacco only turns to tar when it is extremely hot and burning.



I took a small pinch and completed a few tests with the sound setting on the multimeter and heard no noise. I wondered if the tobacco was too stringy and tried again after pressing it together into a dense lump but had the same result. I then attempted some resistance tests on the 20kiloOhms setting and got the result of 1- resistance to high to measure on the selected setting.

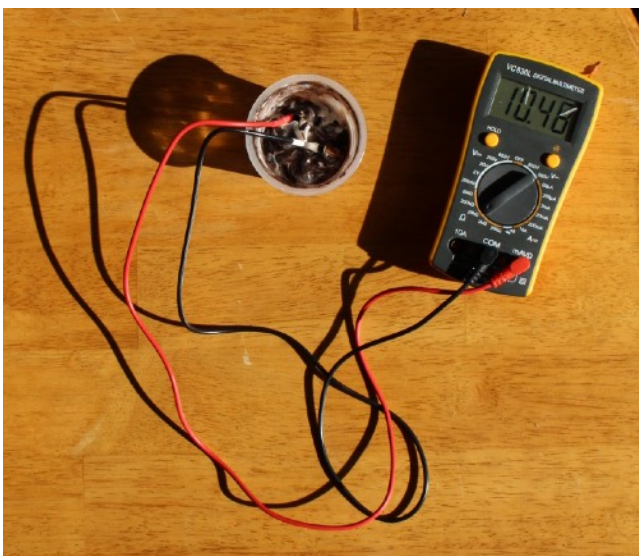


After completing the experiment I found an article that explains how cigarette butts can be turned into electrical storage. However, this uses mostly the filters rather than the actual leftover tobacco.

<http://www.popsci.com/article/science/scientists-turn-cigarette-butts-electrical-storage>

Material 2 - Oreo Jello

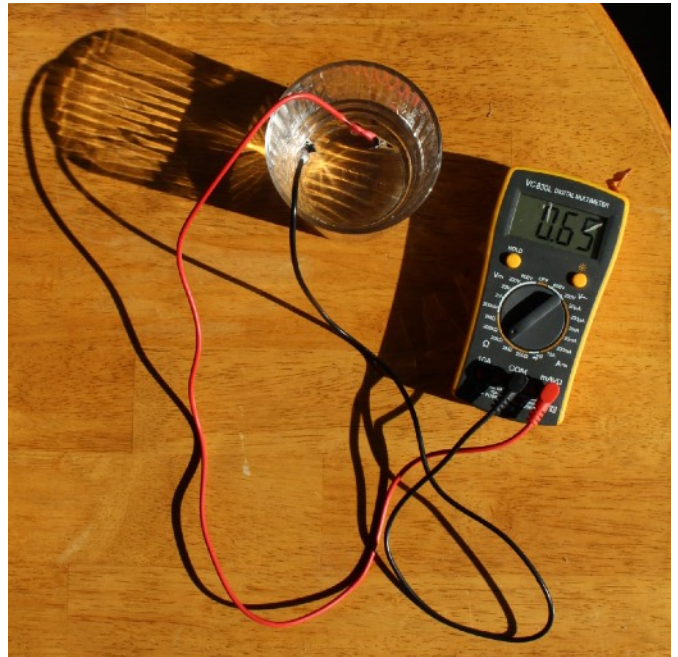
I chose this material next as I was particularly interested to find out if jello substance is conductive as I have worked with play-doh in electrical circuits before (since it contains salt and water so the dissolved ions can move around and conduct current) and wondered if there was a parallel with jello. However, I knew this Oreo flavour jello was sweet and chocolatey so I imagined that it wouldn't be particularly salty, certainly not as much so as play-doh. Structurally it is a wet but gel like substance, and I noticed that when you hold it upside down nothing spills yet it was not as solidified as the transparent jelly you would normally associate with the word "jell-o".



I performed the same experiment on the sound setting of the multimeter and heard nothing- what I expected. However, when I tested the resistance on the same 20kiloOhm setting as I did with the tobacco, the resistance was significantly lower; reading at 10.46.

Material 3 - Watered Plant

For this third material I couldn't decide whether to experiment with water or a plant and then I realised that they are quite synonymous in that water is an essential part of any healthy plant. Of course water is a thin clear and flavourless liquid but it becomes something quite different once it has become part of the plant; even going through a journey of different biological processes. I believed that this would make for an interesting conductor since I guessed that at certain stages its resistance would change dramatically. I did the first experiment with the water posed in the position we feel and use it most frequently- in a glass. Again with the sound setting of the multimeter it made no noise and I was skeptical because I had always believed it to be a decent conductor. I also took the resistance reading and got a result of 0.65.



I decided to also take readings for the plant itself by attaching the crocodile clips to a singular leaf. The sound did not play and I received a resistance reading of 1 - again too high to measure on the selected setting. So the dry leaf alone is not at all a good conductor.



Of course, I then watered the plant directly into the soil (which when dry is a similar structure and consistency to tobacco) and tested again. No sound played but to my surprise the resistance showed 10.04, which was similar to that of the Oreo Jello!

At this point I had an idea for a switch. I remembered a piece of work I had researched by Helene Steiner, a UK based designer and researcher with a focus on new interactions in and with our natural environment. Her project was called Florence and it seeks to unify the digital and physical world by allowing your plant to send you signals via a computer and vice versa.

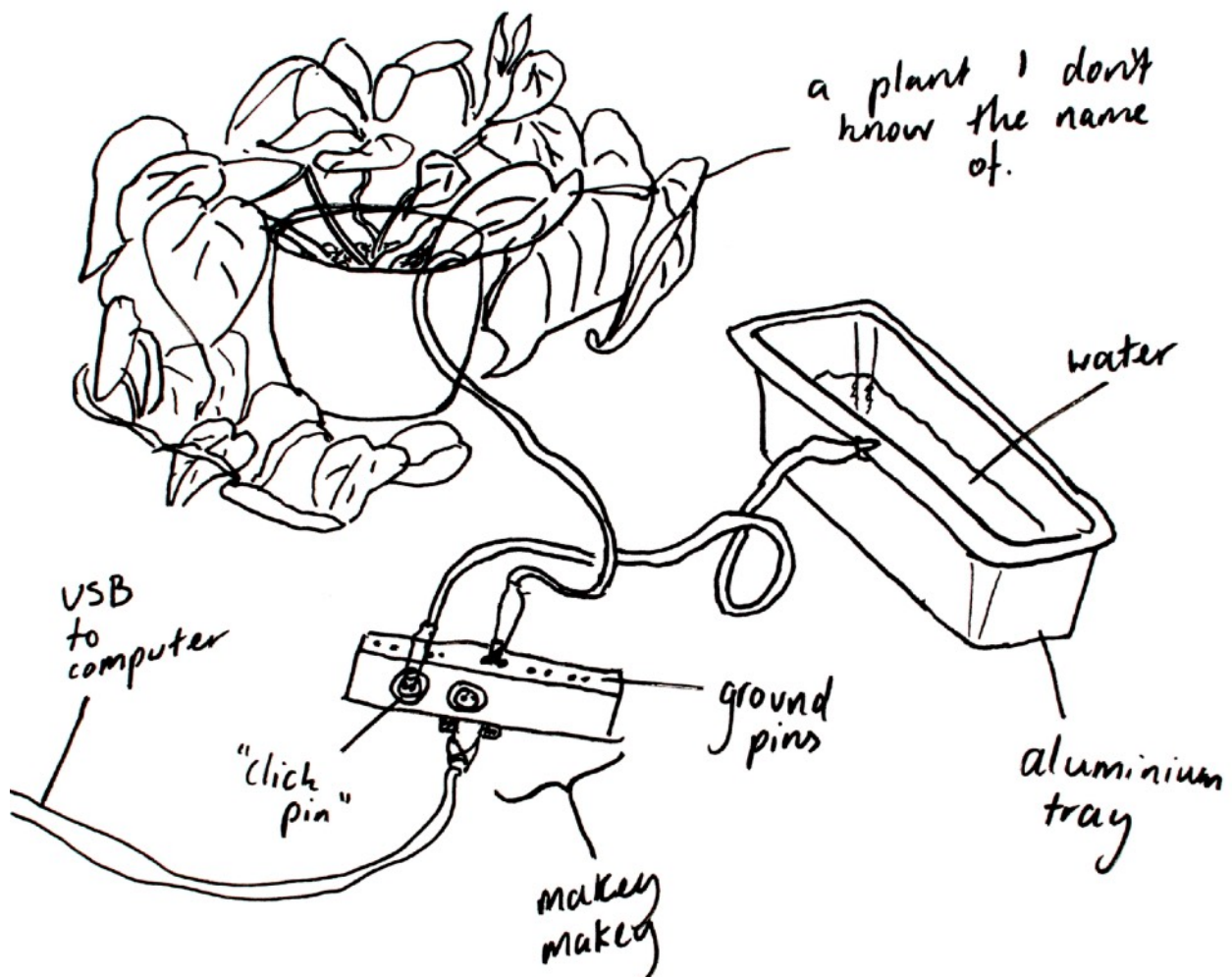
I liked the idea of giving a plant a personality and considering it more as a living being than as an accessory to your house or garden. I considered the easiest way to do this and came up with the idea of having the plant sing back to you when you water it- which would be an incentive to make sure you keep it alive.

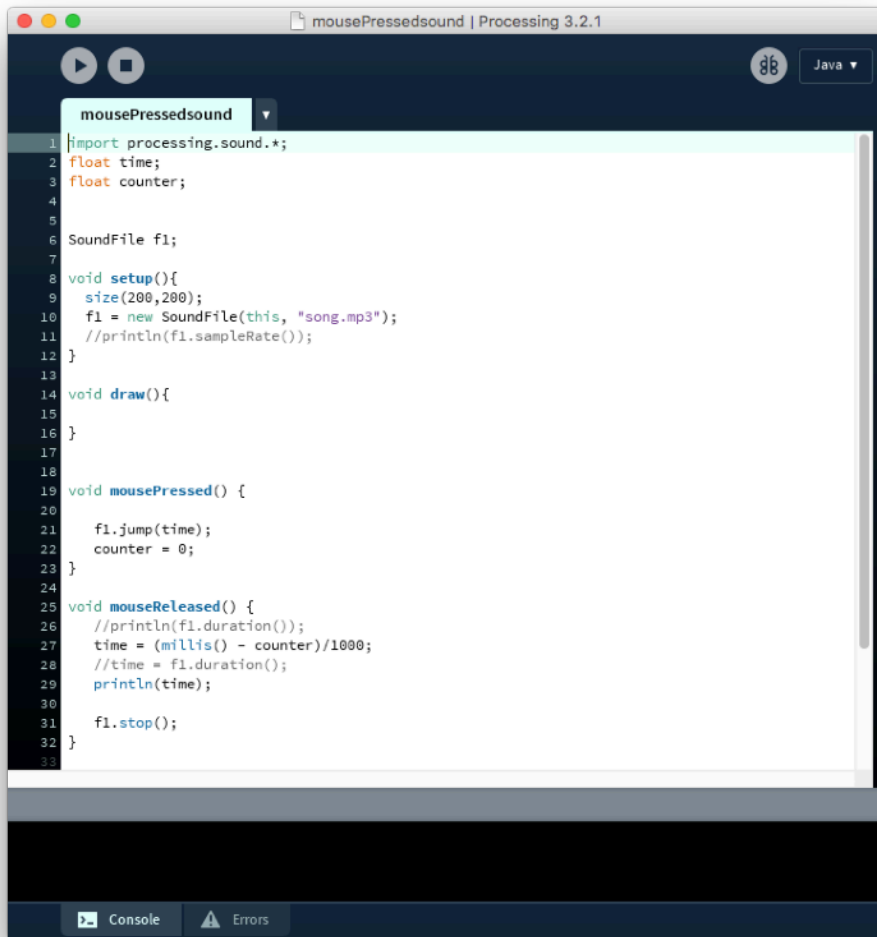


Helene Steiner - Florence

I connected a Makey Makey to the plant and decided to see if the stream of water could act as a conductor. I used a metal pan as the watering can and connected this directly to the "click" pin on the Makey Makey. I connected the ground pin directly into the soil of the plant. I then wrote a small Processing sketch that would play a song file when the mouse was pressed and would pause it when released. I used the song Sleep Walk by Santo & Johnny.

The result was really effective but it had problems as the connection kept losing (likely in the soil) and so it kept stopping and starting but I believe this could be fixed in the code.





```
1 import processing.sound.*;
2 float time;
3 float counter;
4
5
6 SoundFile f1;
7
8 void setup(){
9   size(200,200);
10  f1 = new SoundFile(this, "song.mp3");
11  //println(f1.sampleRate());
12 }
13
14 void draw(){
15 }
16
17
18
19 void mousePressed() {
20
21   f1.jump(time);
22   counter = 0;
23 }
24
25 void mouseReleased() {
26   //println(f1.duration());
27   time = (millis() - counter)/1000;
28   //time = f1.duration();
29   println(time);
30
31   f1.stop();
32 }
33
```

The watered plant was definitely my favourite material to work with because it was the most experimental since I wasn't sure how it would react. I also found the idea of having an anthropomorphic plant that could encourage people to take better care of them really fascinating.

