**Will Busby**

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| Task | Resources Needed | Target Completion Date | Completion? |
| 1. Obtain a fish tank or other water-tight container that is 4 Gallons | Fish Tank/Container | November 6 | |  | | --- | | Original | |
| 1. Create Drawings    1. the container    2. the cathode holder | Knowledge | November 13, 2015 | |  | | --- | | Original | |
| 1. Use Fusion    1. Create the container    2. Create the Cathode holder: the size will depend on the cathode    3. Make drawings of the parts | Fusion 360 | November 19 | |  | | --- | | Original | |
| 1. Learn Github | Github | December 3 | |  | | --- | |  | |
| 1. Construct the box for the fuel cell    1. cut the container to the desired dimensions    2. make the bottom slanted so that water will go to a corner    3. 3-D print the cathode holder | Plexiglass, Laser cutter, 3-D printer | December 17 | |  | | --- | |  | |
| 1. Obtain/Put gravel, sand, other materials in the box in order to avoid mold    1. gravel, sand and then active carbon in that order | Sand, Gravel, active carbon | January 8 | |  | | --- | |  | |
| 1. Culture Bacteria, put in box with soil and the anode | electrogenic microbes, Soil from gardening store, Anode, Rachel Kalish | February 4 | |  | | --- | |  | |
| 1. Put Cathode on the outside of the box    1. attach holder | Cathode | February 12 | |  | | --- | |  | |
| 1. Connect the anode to the cathode with two separate wires.    1. measure any electrical current: see if the fuel cell works: Test to see if microbial fuel cell works | Metal Conductive Wire. multimeter | February 25 | |  | | --- | |  | |
| 1. put plants in the box    1. plant them | Plants, research | March 4 | |  | | --- | |  | |
| 1. Create Arduino program to measure Current | multimeter, research, Arduino | March 23 | |  | | --- | |  | |
| 1. Implement Arduino | Arduino | April 6 | |  | | --- | |  | |
| 1. Decide what to power/See what the fuel cell will be able to power    1. based on output energy    2. Experiment with different things to power       1. Maybe make the wires into an outlet: universal | More wires, research regarding electrical engineering, electrical devices | April 6 -June 8 | |  | | --- | |  | |
| 1. Be finished by end of the year |  | June 8 2016 | |  | | --- | |  | |

**Tools**: Fusion 360, 3-D printer, multimeter, Laser cutter, Weld-on

**Materials**: Plexiglass, Sand, Gravel, active carbon,electrogenic microbes, Soil, Anode, Cathode, Metal Conductive Wires. Plants.

**Plexiglass**: Use the Plexiglass in the Physics Academy room

**Sand and Grave**l: Buy sand and Gravel from a store (Home Depot)

**Active Carbon**: Buy some from Petco

**Soil and Plants**: Buy from gardening store to eliminate possible contamination

**Metal Wires**: Use ones in Physics Academy

**Anode and Cathode**: The anode and cathode are oxidation-resistant, conductive metals such as a gold-plated material, but I don’t know where to find it. Zinc and copper plated material for the anode and cathode respectively

**Electrogenic Microbes:** These bacteria use the anode as the final electron acceptor in their electron transport chain therefore donating their electrons to the anode. The bacteria that I will be using is either *Shewanella putrefaciens* or *Aeromonas hydrophila* depending on how accessible each one is. (In the research in the netherlands, the bacteria were naturally in the ground, but in order to control the project, I will need to culture and place the bacteria where I want in the fuel cell)

**Cathode**: Copper

**Anode**: Zinc

Plant: (*Glyceria maxima*), rice, common cordgrass (*Spartina anglica*) and giant reed (*Arundo donax*)