Idea Behind The Project 10/22/25

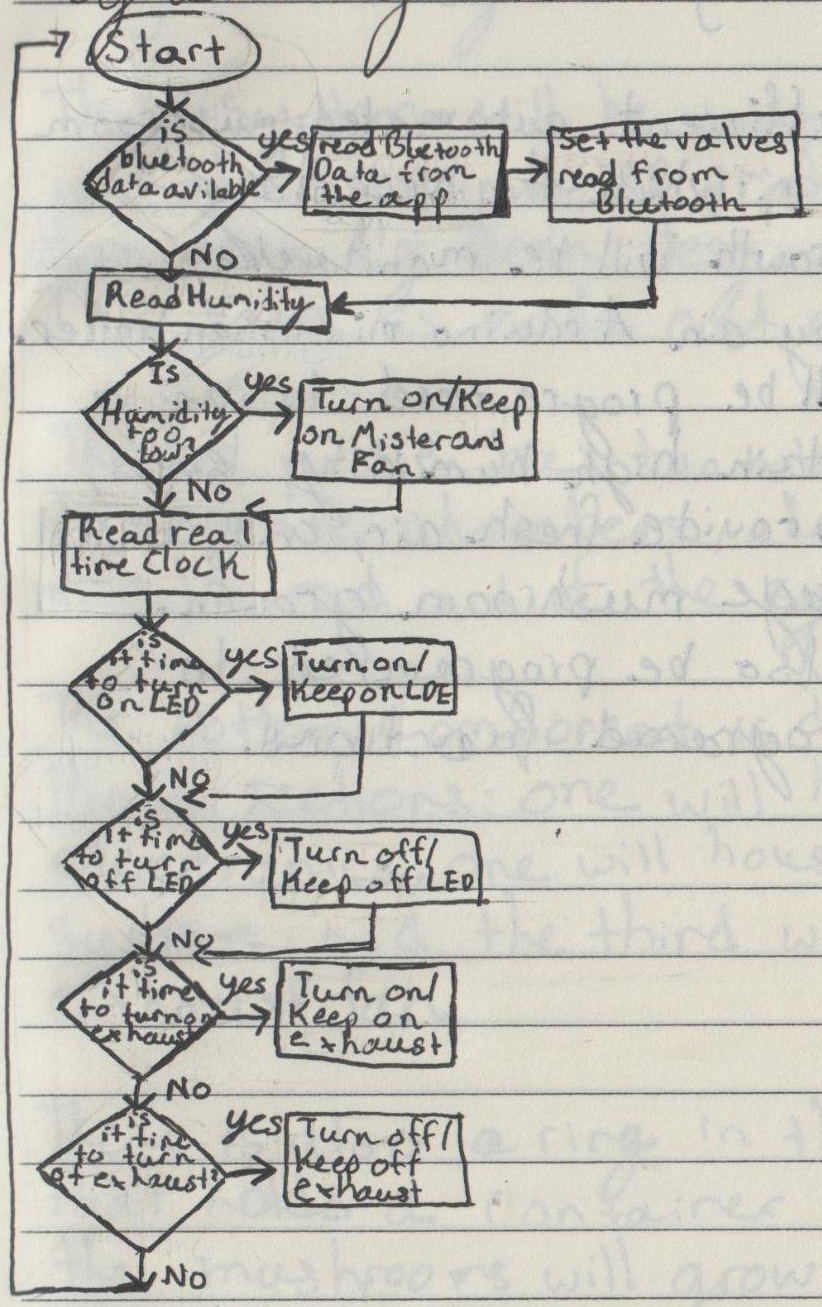
This is my last possible year to do a science fair project and I want to continue my legacy with something grand. I know that I want to do something potentially life-changing that could impact the world if widely distributed. My dad came up with the idea for this years science fair project based on our family's most recent interest of growing mushrooms. We have a whole setup in our garage dedicated to growing mushrooms. We have been growing mushrooms since the summer with mild success, but my dad brought it to my attention that having an automated system for growing mushrooms could make the whole process significantly easier and almost foolproof. This could also have a wider impact than just hobbyists, if done correctly this device could help with food insecurities by being able to grow meat substitutes fast all over the world regardless of different climates.

Mushrooms, The Often Forgotten Source of Nutrition 10/23/25

Mushrooms are nutrient rich, being an excellent source of vitamins, minerals and antioxidants. They support the immune system via polysaccharides, which activate immune cells. Mashrooms are low in sodium, cholesterol, and have been shown to help reduce blood pressure through compounds and antioxidants that combat inflammation and arterial plaque. Some studies have even been shown to contain anti-cancer compounds that prevent tumor growth and protect against some kinds of cancers. They provide the benefit of being low in calories and fat but are filling, making them a healthy addition to a weight loss diet. Mushrooms are a good source of fiber, promoting healthy digestion and prevent constipation. Mushrooms are filled with prebiotics that feed beneficial gut bacteria, and contain polysaccharides which feed this bacteria. Additionally mushrooms are a good source of folate, making mushrooms a good supplement for pregant women to add to their diets. Each mushroom are grown and eaten for different benefits, so I will have to do research for chossing the best mushroom to design my device to grown.

Programming Plan

1/18/26



Engineering Objectives

1/19/26

To create an efficient automated mushroom growing system in which the necessary conditions for growth will be monitored and controlled by an Arduino microcontroller. The Arduino will be programmed to run a mister to maintain high humidity levels, run a fan to provide fresh air, and control LEDs to encourage mushroom growth. A phone will also be programmed to control the programed functions.

Project Design

1/19/

This system will be composed of a glass jar that sits in a 3D printed base that has already been designed and printed. This base is made out of two pieces:

The top piece has two holes that lead to seprate chambers, allowing air and mist in and out of the system

The bottom component is divided into three sections: one will houses of the electronics, one will house the misting system, and the third will hold the exhaust fan.

There is also a ring in the bottom that holds a container from which the mushrooms will grow out of