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Hydroponics 5
GNG1103[D]
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**Project Deliverable F: Prototype I and Customer Feedback**

**Introduction**

After coming up with our project plan and project schedule, we are now ready to build our first prototype, make a test plan and analyze our client feedback to improve our next prototype.

# Why are we doing this test?

**This is an introduction. Capture the reasons for the test, giving enough background information to justify doing any prototyping at all. Is the general objective one of: learning, communication, de-risking, etc.**

Our main goal from this prototype is to visualize what our hydroponic system will look like. From this first prototype, we will get a general idea of which parts of this system are optimal and which parts might cause some problems and which parts are gonna take more time to build and which parts will be quickly done. In summary, the general objective of this prototype is to learn everything we can about our selected concept and to help us establish every step of the building process.

## Test Objectives Description

**What are the specific test objectives?**

Like we mentioned before, the specific objective of this prototyping is to diagnose the more troublesome parts of our system whether it is because of a problem that a certain part could bring forth once the construction is done, like leaking, or because building this part will be tricky and need more time and attention.

**What exactly is being learned or communicated with the prototype?**

With this prototype, we developed a good understanding of our concept and established a list of which part of this system will need more time and attention for the construction of the final product due to the complexity of the construction task or to the problems we might encounter and need to avoid.

**What are the possible types of results?**

Our results are in the form of a list which states the parts of our system that could prove themselves troublesome.

**How will these results be used to make decisions or select concepts?**

The results will influence our decision making concerning the allowed time on certain parts of our system and will also help us plan the construction phase of our product more accurately.

**What are the criteria for test success or failure?**

Complete success is a prototype with no foreseeable issues that would hamper its intended operation. A prototype is expected to have issues though, so if some minor, fixable problems manifest in our prototype, it can still be a success. A failure is when there are too many minor issues, or a major issue that cannot be easily fixed without fundamentally altering the design. In this case, the prototype design is thrown out and a new design chosen for the next prototype.

# What is going on and how is it being done?

**Describe the prototype type (e.g. focused or comprehensive) and the reason for the selection of this type of prototype.**

Our prototype is made of cheap materials without caring much about the dimensions in order to establish core functionality and identify problematic areas. We also have a sketch with dimensions to determine parts that could bring up problems during the construction.

**Describe the testing process in enough detail to allow someone else to build and test the prototype instead of you.**

After building the representation of our system and making a sketch with the dimensions, we used our critical thinking and engineering knowledge to distinguish key points of our system that could prove to be problematic.

**What information is being measured?**

The difficulty of each task construction-wise as well as the likeliness of bringing up a problem after or during the construction, and that for each part of our system.

**What is being observed and how is it being recorded?**

The likeliness of bringing up a problem for each part of our system and it is being recorded in the list we made further down this document.

**What materials are required and what is the approximate estimated cost?**

Miscellaneous items from around the house such as cardboard and plastic straws for our model and a pen and paper for the sketch and the list. The estimated cost is $0 to $5.

**What work (e.g. test software or construction or modeling work or research) needs to be done?**

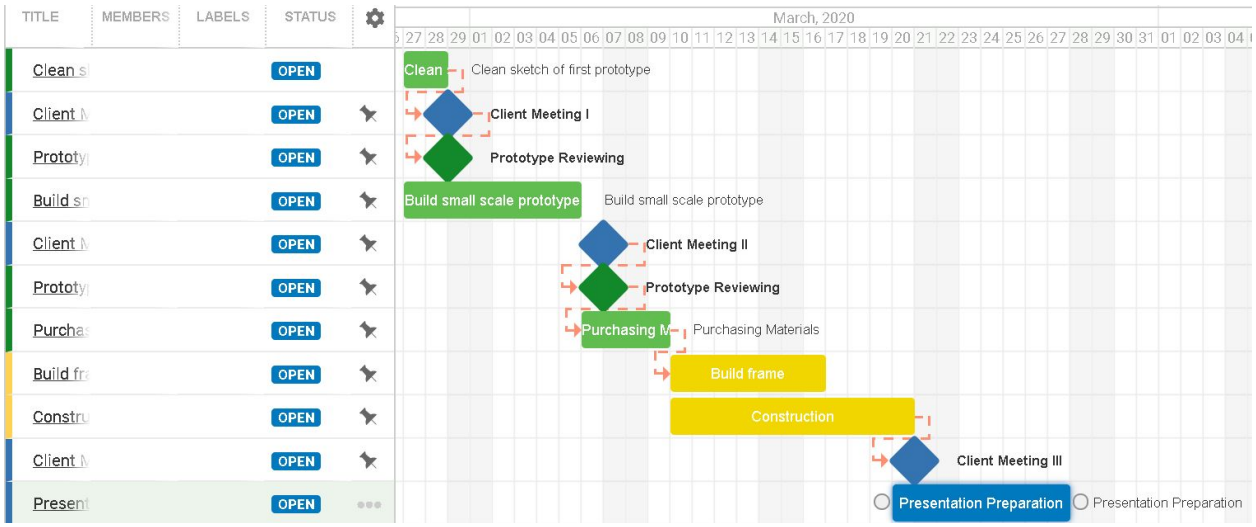
The construction of the model, the sketching of our system and an analysis of these to come up with the list.

# When is it happening?

**How long will the test take and what are the dependencies (i.e. what needs to happen before the testing can occur)?**

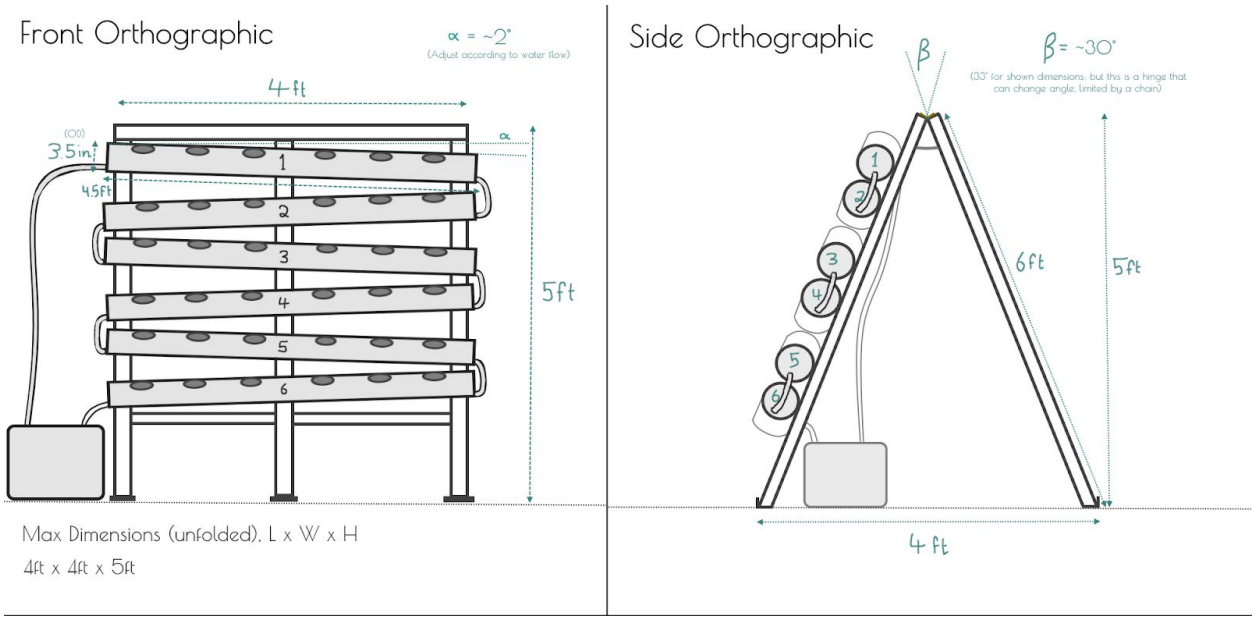
The test will take approximately one week, and can be done as soon as the conceptual design is selected, which is the case right now.

**A separate test planning Gantt chart can be created to help make sure that the testing fits with the overall project schedule or it can be defined as part of that schedule (i.e. as a sub-task).**



**When are the results required (i.e. what depends on the results of this test in the project plan)?**

The results are required before the making of prototype II.




**Observations:**

- Pump type need to be decided, (voltage, power consumption, etc)
- Water collection technique consideration.
- Which type of solar panel is going to be used? (DC?)
- Does the solar panel need a battery?
- How much height needs to be increased to allow gravity works?
- What kind of nutrients are going to be used?
- We need to make sure the extremities of the pipes do not leak
- Water pump needs to be able to bring the water to the top pipe
- Frame has to hold the pipes in place
- We need to determine a recipient for the plants
- We need to think about which fittings are necessary for our pipes

**Conclusion**

To conclude, we will build our first prototype using materials and components that cost very little, we have made a test plan describing thoroughly the circumstance of the making of this prototype and we have analyzed our client feedback and identified some points that we need to improve for our next prototype. The next step of this project will be building our prototype II and receiving feedback on this second prototype.