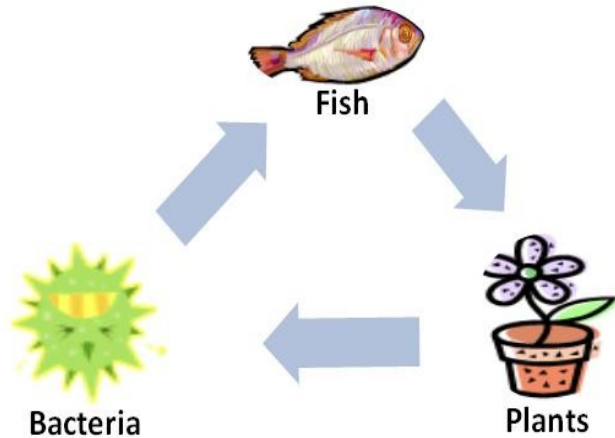


Aquaponic system manual

In their natural environments both fish and plants are subject to constant water and air flow. For millions of years of evolution their bodies adapted to this. Even more, they require constant environment change to function properly. But in closed conditions of a fish tank or a flower pot it's hard to get such a flow. Aquaponics solves this problem by combining plants and fish together and creating water and air circulation in a closed system.



To start the system

1. Assemble the system stand, install planters, fish tank and water circulation equipment according to appendix A
2. Fill the planters with growing medium.
3. Add gravel, install decorations and fill the fish tank full with rain or pond water. Don't use chlorinated water. Even when chlorine is neutralized, it still contains undesirable chemicals, that can harm fish. If you are using rain water, add 1 tea spoon of aquarium salt per each 2 gallons of water.
4. Start the pump. Check is there is any water leaks in the tubing or planters.
5. Adjust the maximum water level in planters by lifting or lowering the height of the siphon tube loop. The maximum water level should be 1 – 2 inches below the growing medium surface.
6. Cut, if needed, the free end of the siphon tube. Attach it with the clip ½ inch below the fish tank top, but above water level. The siphon wouldn't function if it touches water. Use strong scissors or a knife to cut the tube. You may need to ask for help a technician to do this operation. Attach the hook screw to the inner side of the upper front part of the stand. Put the siphon tube into the hook. The tube should never be hard bent. The proper siphon functionality is crucial to the system because it adds oxygen to water and aerates plants' roots. This way the fish get the required air flow and plants' roots don't rot.
7. Let the system cycle idly. Watch for leaks and proper siphon functionality: the siphon should flush water from planters relatively fast then break for a couple of minutes, then the cycle repeats. It's normal for water to get murky at the beginning. The systems will clean itself in 24 hours.
8. Release some fish into the aquarium. It's normal for fish to get stressed and refuse to feed for 1 – 2 days. The tropical fish may require water heater. Goldfish, Koi and wild-caught fish don't.
9. Plant some plants in the growing medium. You can use seedlings from a nursery. Carefully wash off the earth from roots before planting. If you don't have direct sunlight, use shade- and

water-loving plants.

Some considerations

Light

Proper lighting is very important for the plants to survive and function properly as a part of the system. The direct top sunlight (even through glazing) is the best. If there is no possibility to use the sun, install a plant-friendly grow lights, such as special fluorescent, LED – powered or HPS lights available from hydroponic and general hardware stores.

Water quality

It's a good idea to monitor water pH weekly. In first 6 -12 months it may be required to replace 1 gallon of water each week. If you replace with rain water, add ½ tea spoon of salt for each gallon.

In an aquaponic system water tends to evaporate faster due to plants' respiration. Check water level weekly. Add water if required. DON'T add any salt in this case.

Some amount of worm compost should be added to water once a month to compensate missing minerals and beneficial bacteria.

Plants

Use only water- loving plants, like water cress, roses, lilies, etc. The improper plants will rot fast, spoiling water.

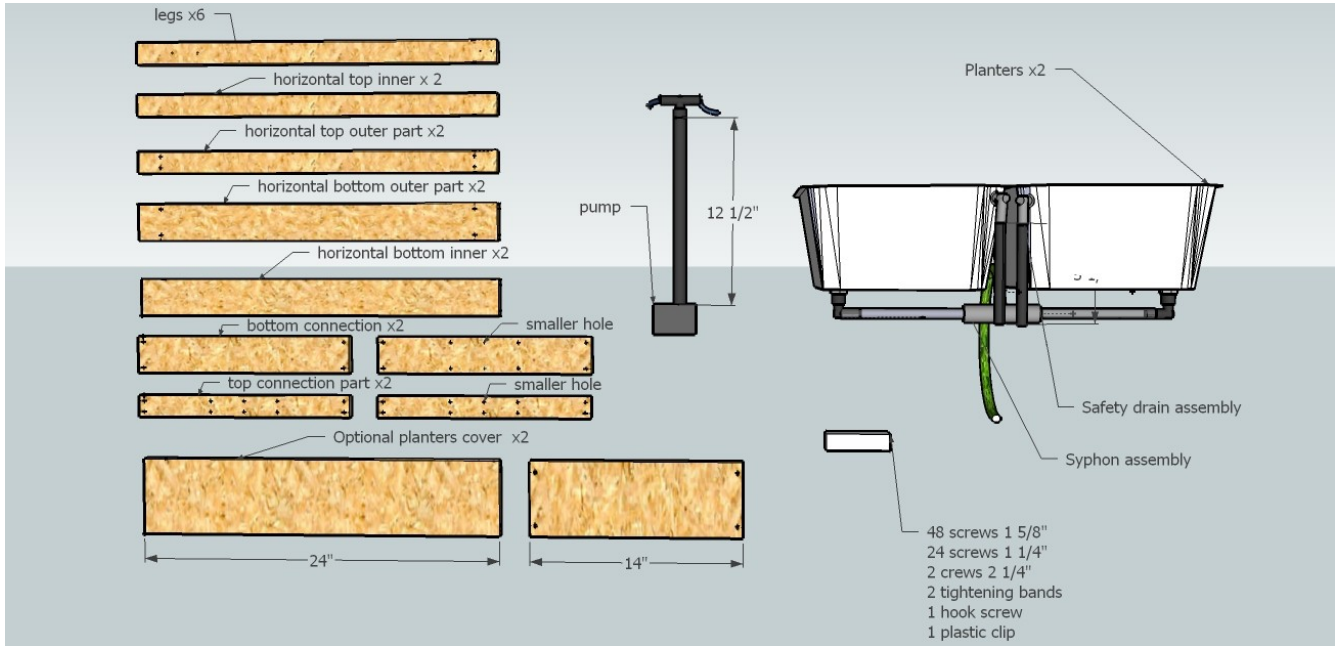
Fish

It's easier to start with a sturdy specie like Goldfish or Koi. Any kind of fish will be happier in an aquaponic system, then in a regular fish tank. Wild-caught fish may refuse to eat prepared food. They need live food, like earthworms. Gold fish might help the wild fish to learn eat prepared food.

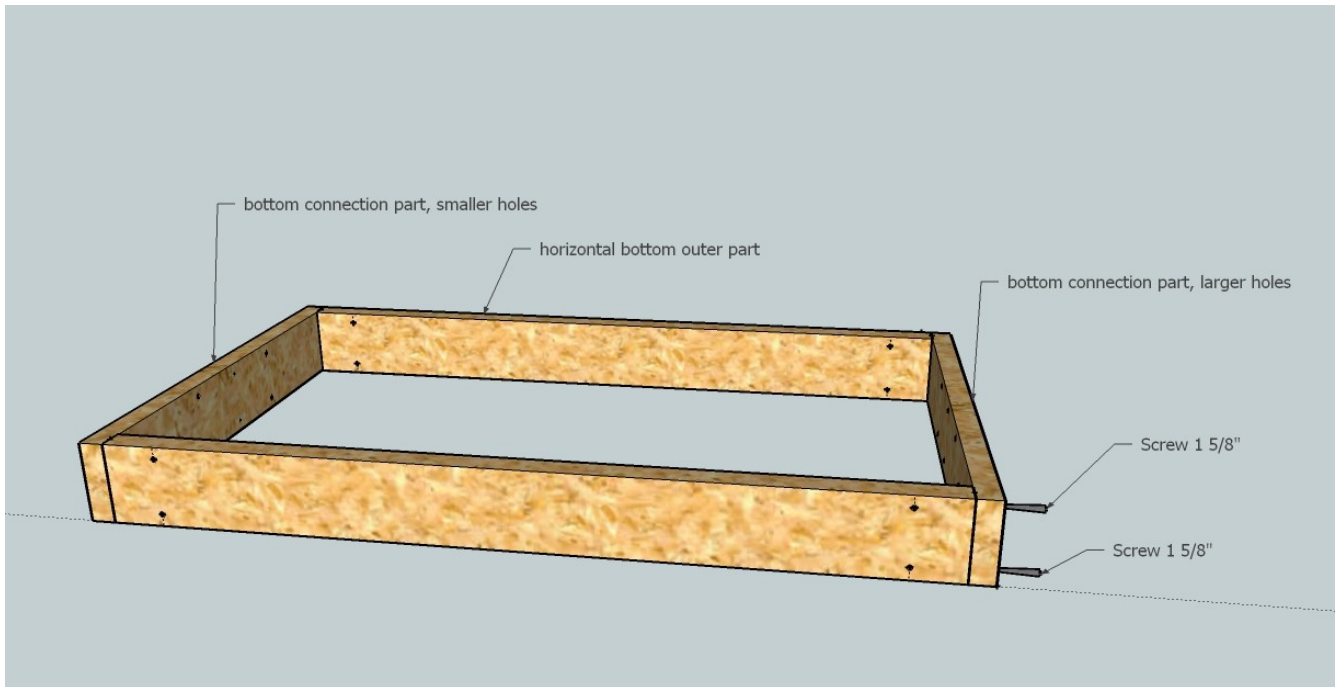
Appendix A

System assembly

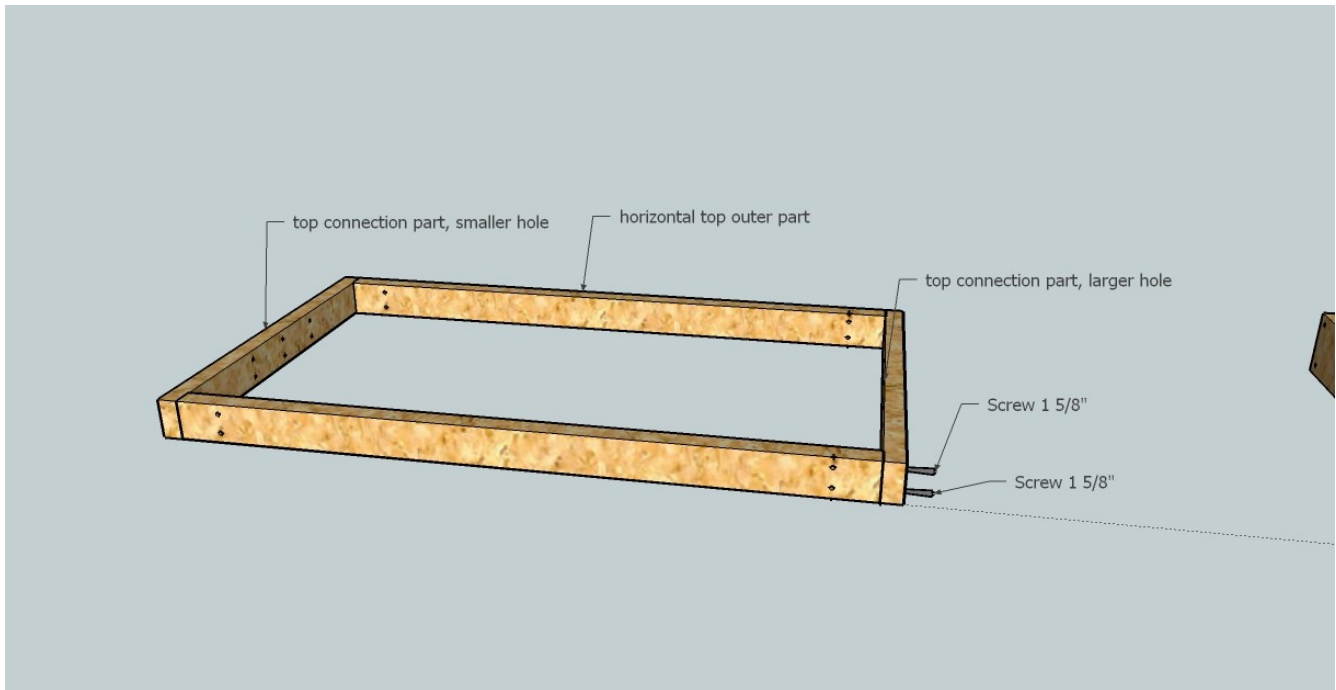
Component list



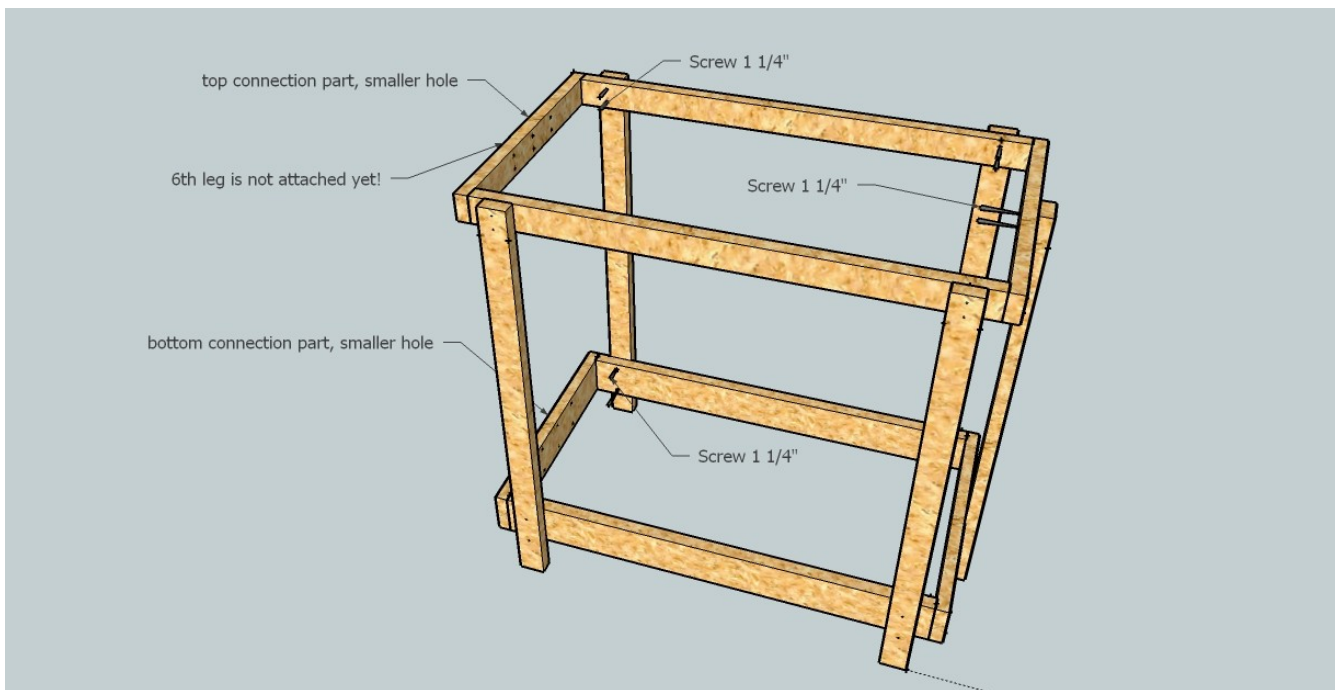
Lower shelf assembly (wider boards)



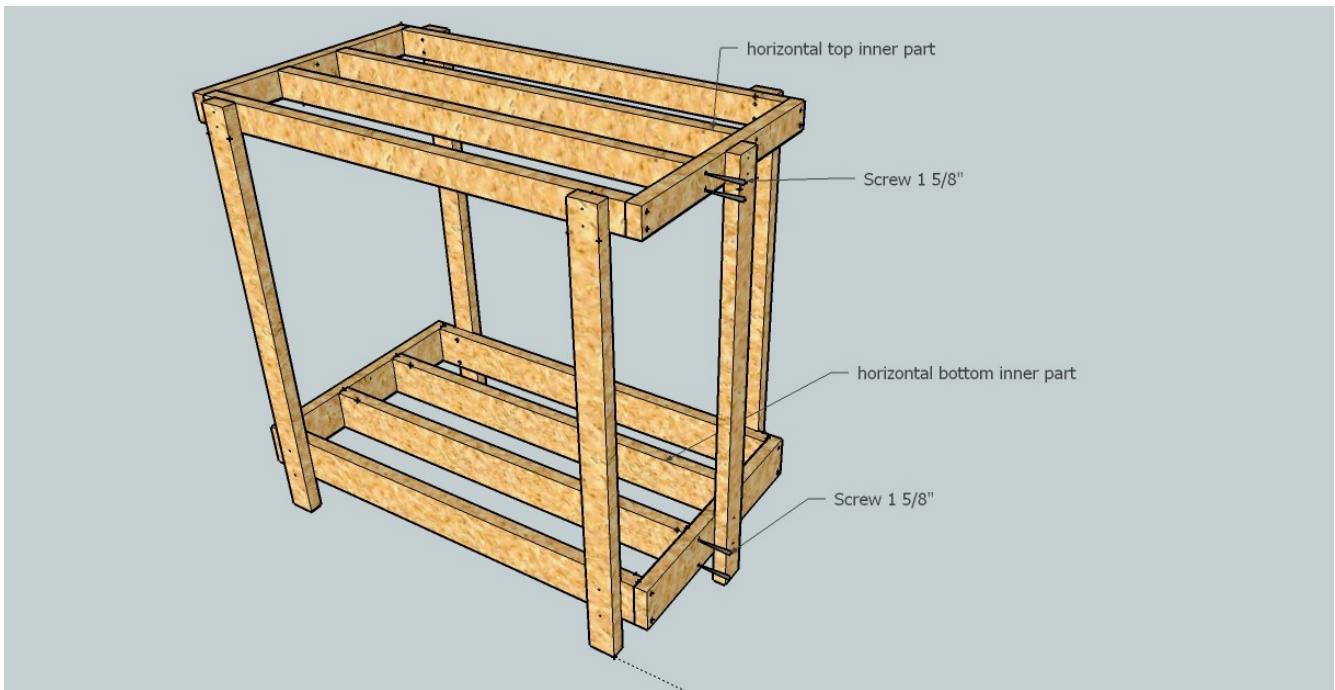
Upper shelf assembly



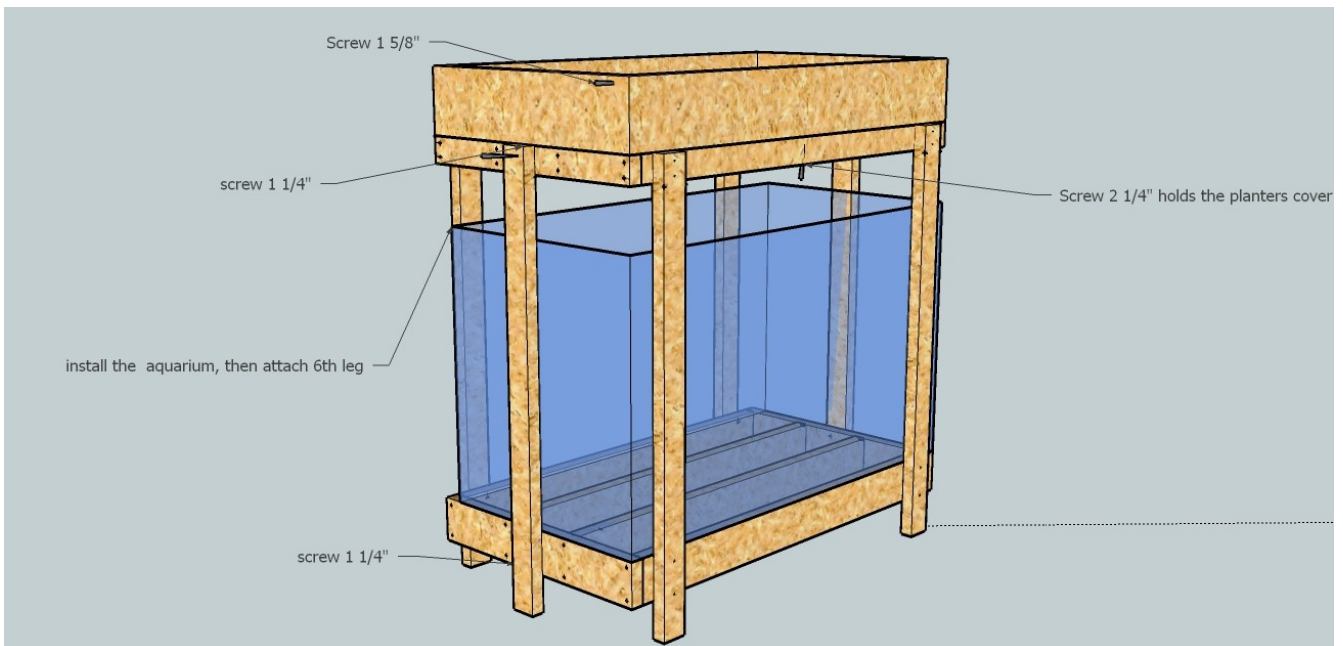
Attaching 5 legs



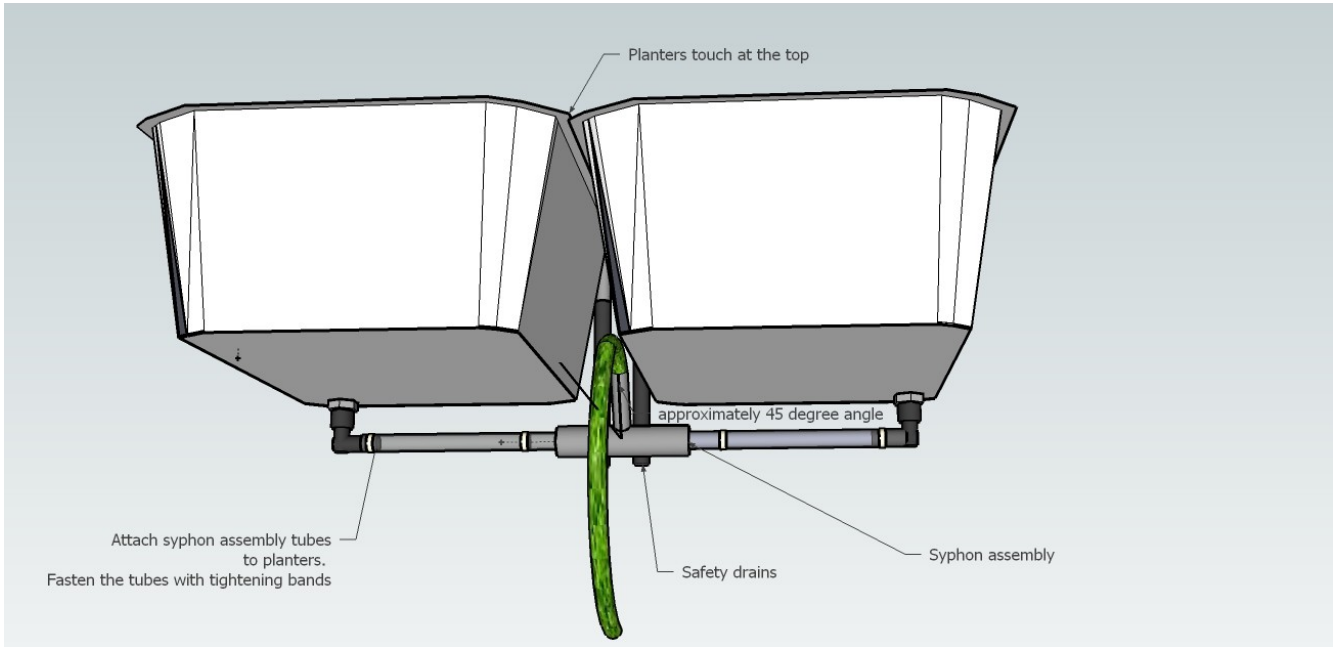
Assembling internal parts of the shelves



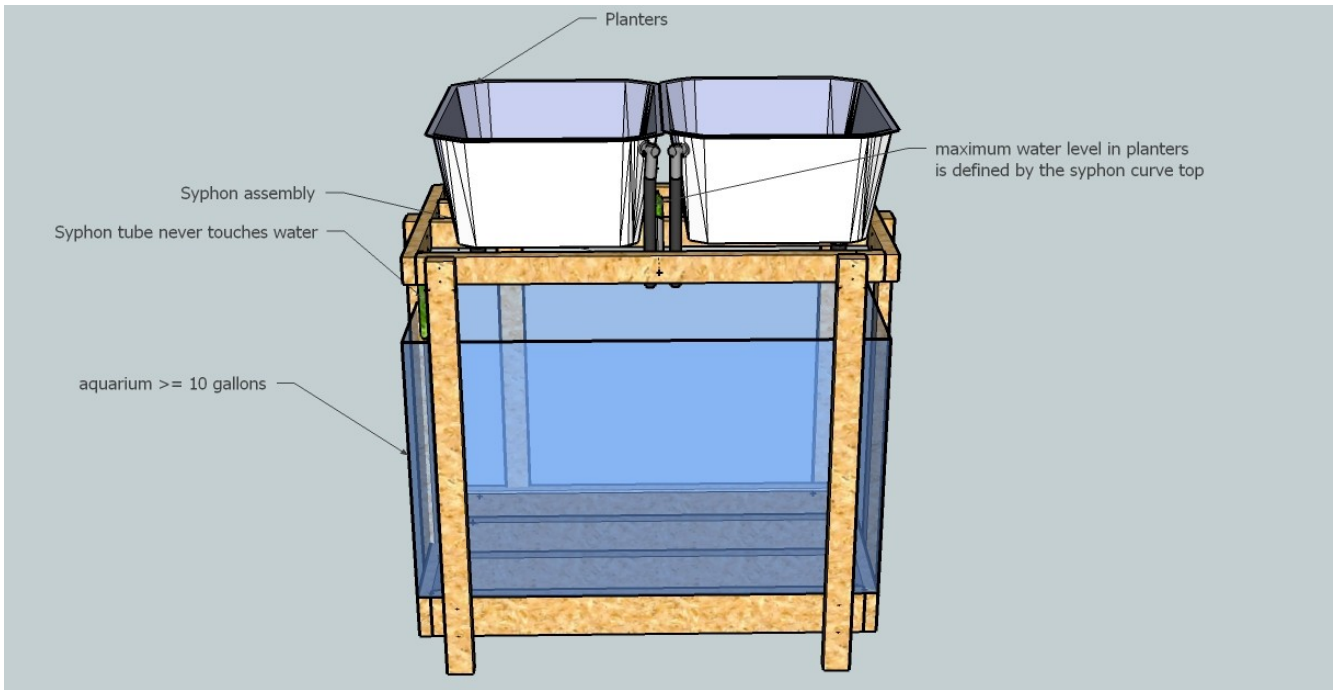
Installing the fish tank and attaching the 6th leg.



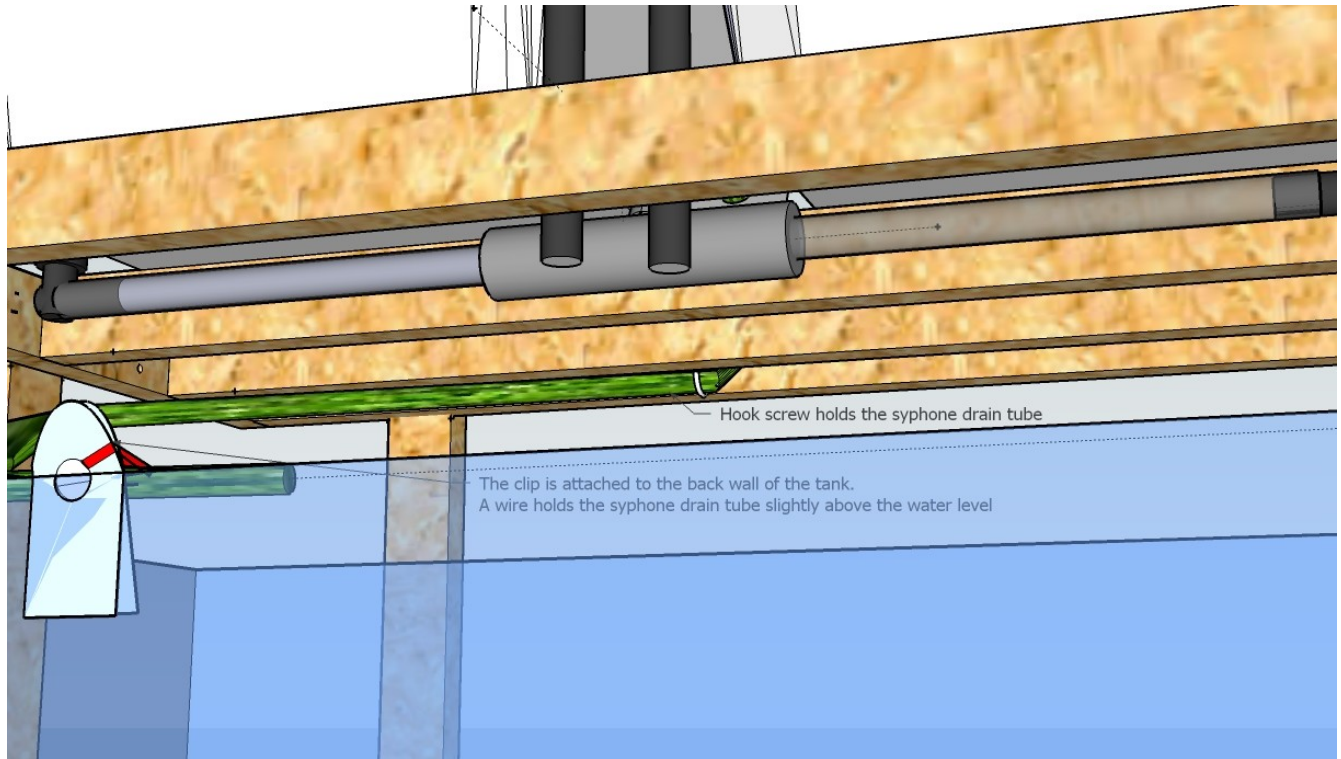
Assembling planters, siphon and safety drain



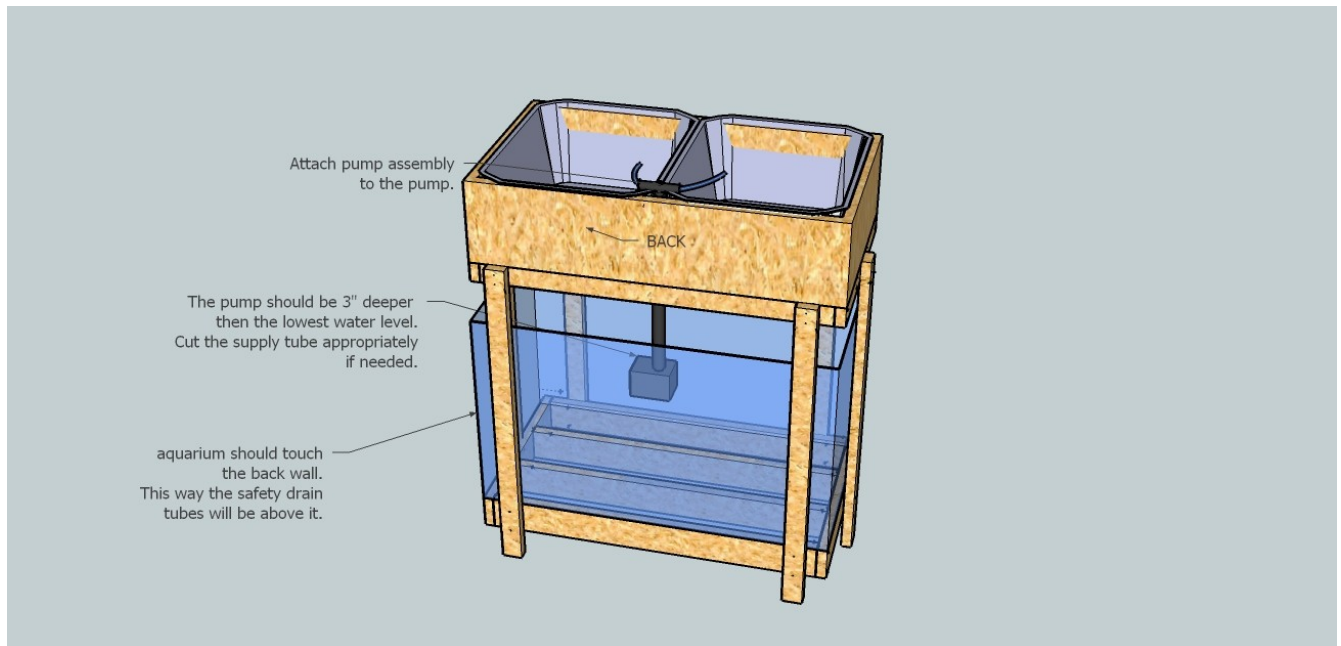
Installing the planters.



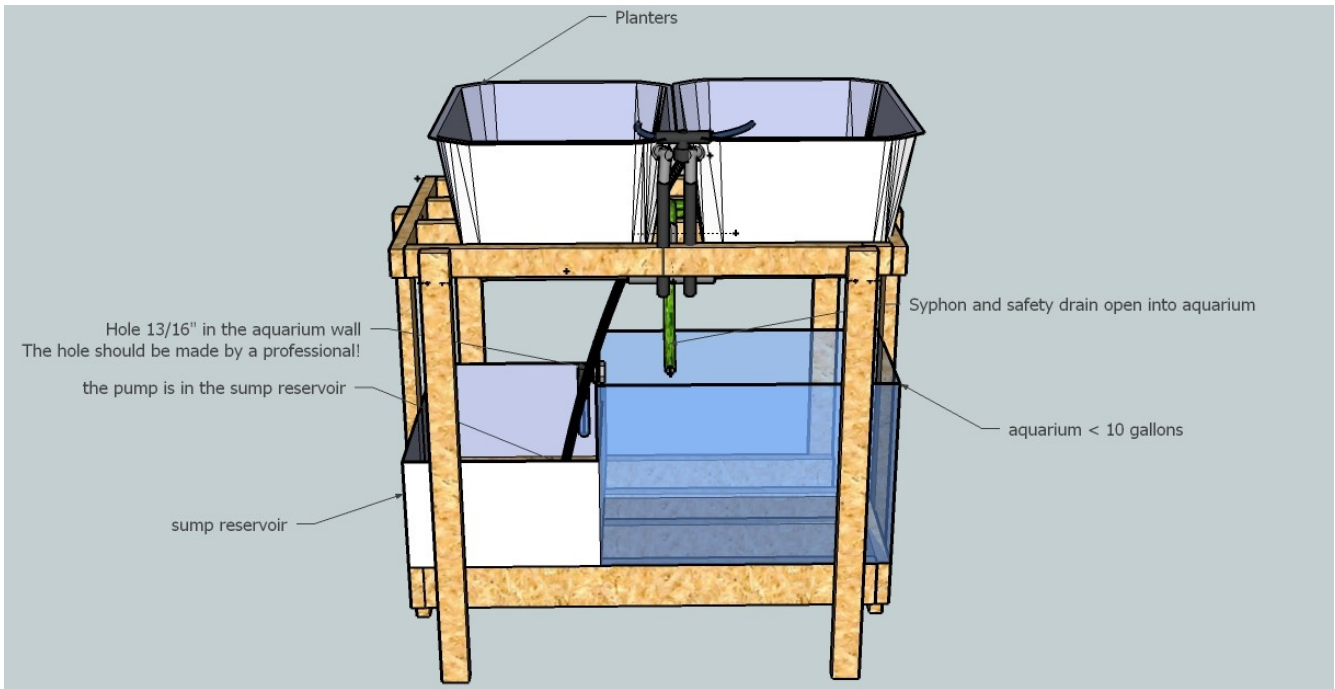
Attaching a hook screw to hold siphon drain tube



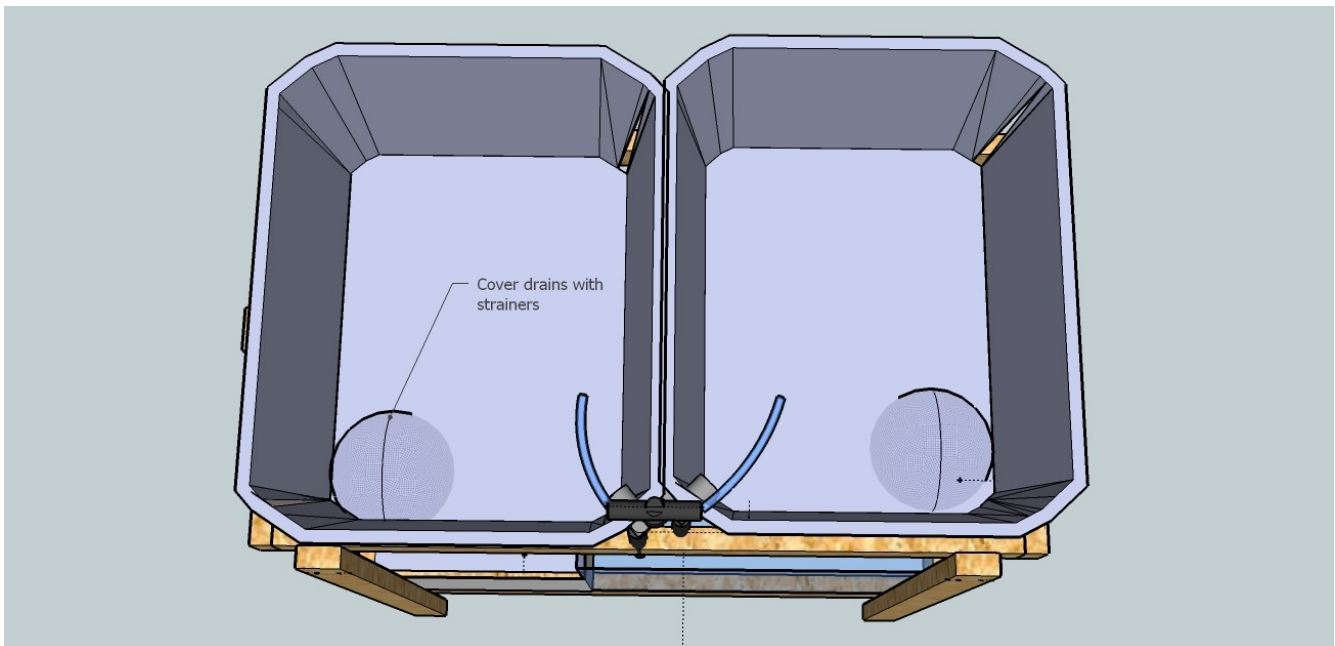
Installing the pump with water supply tube



A case of a small fish tank. A sump reservoir is required.



Adding strainers.



Filling the planters with growing medium to the level of safety drain openings.

