

At Home Aquaponics Instructions

Materials

10 gallon aquarium
PVC Pipe (1-1/4" x 2')
Clear Vinyl Tubing (5/16" inner diameter x 7/16" outer diameter x 10')
Submersible water pump
Net Pots
Peat Pods
Grow Light
Fluval Foam Filter Block

Tools

Drill
Chop saw or PVC cutter
Table or hand saw
Small drill bit
Step down bit or Forstner bit
Tape measure
Orbital sander or sand paper

1. Cut the Pipe or Beam to hang on the aquarium for plants to grow in.

Measure the length of your aquarium to find the cut dimensions for your PVC pipe. The PVC pipe will rest on top of the tank. Be very precise with your measurement. (19 5/16" shown on the video)



Pro Tip: Measure twice, cut once!

Mark the measurement on the PVC pipe and make your cut.



Cut 1/2" end slits in each end of the PVC pipe to allow it to hang on the tank. Make sure your cuts align and are more towards one side of the pipe, not down the middle.



Pro Tip: Cut with the printed side of the PVC pipe facing outwards to make it easier to align the two end cuts.

2. Space and cut holes for plants in the PVC pipe

Draw a line from end to end on what will be the top side of the PVC pipe using a straight edge and measure out where to place holes for plants. (There are five planter holes in the video.)



Clamp down the PVC pipe and drill starter holes where you intend for the plants to go.



Then use a step down or 1" Forstner bit to make the holes larger.



Pro Tip: Be careful not to make the hole larger than your net pot and don't cut through the other side of your PVC pipe.

3. Drill in a drain hole and hole for the pump tubing before sanding down the PVC pipe. (Note: Make sure your tubing fits with your pump first.)

Make a drain hole at one end of the PVC pipe using a drill to make a starter hole and then a step down or 1" Forstner bit to make it larger. This hole will be smaller than those made for the net pots.



Using your pump diameter for a reference, drill a hole where the tubing will be inserted on the opposite side of the pipe from the drain hole, underneath the net pot holes. The tubing needs to have a snug fit so don't cut the hole too big.

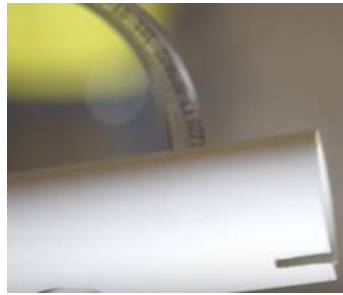


Sand off the rough spots on the PVC pipe using orbital sander or a piece of sandpaper.



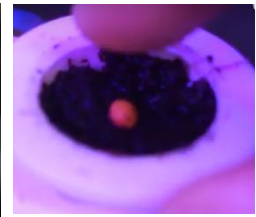
4. Begin assembling the aquaponics kit.

Fit the tubing onto the bottom of the PVC pipe and cut the tubing to eliminate slack from the pump to the pipe. Then attach the tubing to the pump making sure it is snug on both ends.

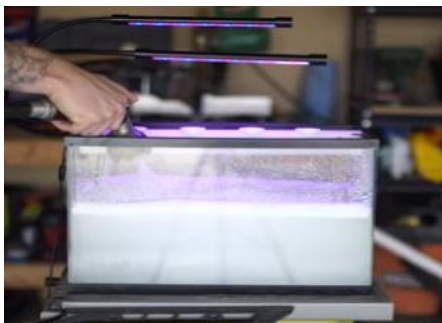


Add filter sponge materials in both ends of the PVC pipe to act as a surface for bacteria to live. Then angle the PVC pipe to insert it into the aquarium.

Place net pots in top holes on PVC pipe add peat material and seeds of your choosing to net pots.



Clip on the light, fill the aquarium with water and turn on the pump. Get fish or prawn for your tank and check pH to make sure it's good for the fish.



Resources

Hydroponic Systems

[Hydroponics in the classroom PowerPoint presentation](#)

(These images were taken from the Hydroponics PowerPoint above)

Mineral nutrient elements are divided into 2 groups.

MACRO nutrients

Primary:	Nitrogen (N)	Phosphorous (P)	Potassium (K)
Secondary:	Calcium (Ca)	Magnesium (Mg)	Sulphur (S)

MICRO nutrients

Iron (Fe)	Boron (B)	Zinc (Zn)	Copper (Cu)
Manganese (Mo)	Sodium (Na)	Chlorine (Cl)	Cobalt (Co)

pH Values For Different Hydroponic Crops	
(From Hydroponic Food Production by Howard M. Resh Woodbridge Press, 1987)	
Plant	pH Range
Beans	6.0-6.5
Broccoli	6.0-6.5
Cabbage	6.5-7.5
Cantaloupe	6.5-6.8
Carrots	5.8-6.4
Chives	6.0-6.5
Cucumbers	5.8-6.0
Garlic	6.0-6.5
Lettuce	6.0-6.5
Onions	6.5-7.0
Peas	6.0-6.8
Pineapple	5.0-5.5
Pumpkin	5.0-6.5
Radish	6.0-7.0
Strawberries	5.5-6.5
Tomatoes	5.5-6.5

Aquaponics Systems

[Small Scale Aquaponics with Greg Fripp](#)

[Just the pHacts: pH and aquaponics - Project Feed 1010](#)

Managing pH levels within an aquaponic system can get a bit tricky because there are three different organisms that must be considered: plants, fish, and bacteria. Each one prefers a slightly different range of pH, so it is vital to keep your system in the ideal range. Fish and bacteria prefer a slightly alkaline environment, while plants prefer it be more acidic. This means the optimal range for most aquaponic systems is a pH of 6.5-7.0.