

Floating Raft Hydroponics

6th Grade Garden Lesson

Brief Description:

A floating raft hydroponics system is one of the simplest hydroponic systems to build. This method is ideal for raising fast-growing, leafy greens such as lettuce, herbs and spinach, and can provide students with a constant source of fresh vegetables to sample in the classroom or grow for the school cafeteria. In its simplest form, a floating raft system isn't much more than a basin to hold the liquid and a raft to hold the plants. The system can be used during the winter months in a greenhouse under grow lights to keep your garden going all year long.

Objective:

Students will learn how to build a floating raft hydroponics system, monitor plant growth and compare this soilless growing system to tradition seed starting in soil containers.

Materials:

2 large plastic opaque bins
2 large pieces of polystyrene sheet
Cookie cutters and knives for cutting polystyrene sheet
Soilless growing medium
Individual pots
Lettuce, spinach and basil seeds
Nutrient solution
2 air stones
Tubing
Air pump
2 trays with seed starter soil

Tasks:

4 kids	Measuring distance between holes in polystyrene sheet and cutting holes.
4 kids	Filling tubs with water and adding nutrient solution.
2 kids	Assembling aeration system with air stones, tubing and pumps.
5 kids	Filling bowl with water and lemon juice, soaking the growing medium in the solution, and filling pots with growing medium.
Everyone	Planting two seeds in each pot.

Why does Hydroponics work so well?

That's simple. If you give a plant exactly what it needs, when it needs it, in the amount that it needs, the plant will be as healthy as is genetically possible. With hydroponics this is an easy task; in soil it is far more difficult.

With hydroponics the plants are grown in an inert growing medium and a perfectly balanced, pH adjusted nutrient solution is delivered to the roots in a highly soluble form. This allows the plant to uptake its food with very little effort as opposed to soil where the roots must search out the nutrients and extract them. This is true even when using rich, organic soil and top of the line nutrients. The energy expended by the roots in this process is energy better spent on vegetative growth and fruit and flower production.

If you grow two genetically identical plants using soil for one and hydroponics for the other, you will almost immediately see the difference this factor makes. Faster, better growth and much greater yields are just some of the many reasons that hydroponics is being adapted around the world for commercial food production as well as a growing number of home, hobby gardeners.

We are going to test out this hypothesis.

Building the Floating Raft Hydroponics System

Directions:

1. Using a cookie cutter, make three rows of holes in the polystyrene sheet. Space the holes 3 to 4 inches apart and do not place any holes closer to the edge than 3 inches.
2. Fill the bin to within a few inches of the top with water and hydroponic plant fertilizer.
3. Attach an air stone to a length of tubing and connect the other end of the tubing to the air pump.
4. Soak growing medium in a solution of water and lemon juice. Fill pots with growing medium.
5. Put two seeds of either lettuce, spinach or basil in each pot.
6. Float the polystyrene sheet on top of the water. Slip one pot in each hole, making sure that the bottoms of the pots are actually touching the water. Label the rows with the name of each plant.
7. Plug in the air pump and check that a stream of bubbles is coming out of the air stone. Check the stone periodically to ensure that it doesn't get clogged.
8. Plant lettuce, spinach, and basil in 2 trays with seed starter soil.
9. Periodically check water level and add more plant fertilizer when needed.

10. At 3-4 weeks, check growth of hydroponic plants vs. seedlings grown in soil.
Measure height of plants.
11. Which plants are taller? Explain why?