HYDROPONICS: LAB ESSENTIALS

Lab Essentials

- There are many essential pieces of equipment and materials in the hydroponics lab
- It is important that each student knows how to use all material and equipment
- While you will be working on one specific system, having a basic understanding of each system is helpful to your classmates and teacher

Lab Essentials

- Remember the basic ground rules for work in the lab
  - No food or drink in the lab
  - No horseplay
  - Follow all instructions closely and carefully
  - Ensure that you can hear instructions when they are given
  - Ask questions if you are not sure what to do
  - Never eat or drink anything in the lab unless instructed

Lab Essentials

- We start each of our plants from seed
- In order to do this, we use a propagation tray
- We use rockwool to sprout the seeds in – these are the Gro-Den plugs
- Each plug has a small hole in the top where we put the seeds

Lab Essentials

- We use a small version of the Gro-Den, but it comes in many sizes
- Gro-Den is an excellent tool for hydroponics as it retains water well and provides structure for the seedlings
- We usually put 2-3 seeds in each plug to ensure at least one or two sprouts
- It is important that the Gro-Den plugs stay wet throughout propagation or the seeds will not grow

Lab Essentials

- As each seed begins to grow, we will need to transplant the new plant
- Plants are ready to transplant when they have established roots on the outside of the rock wool
- When the roots have reached a decent size, we will transplant them

Lab Essentials

- Depending on which system you are using, we may need to use net pots or baskets to support our plants
- We use a wick system in these net pots to help the new roots get the water and nutrients that they need
- We use wicks and net pots in NFT, aquaponics, aeroponics and the flood table

Lab Essentials

- We have seven different stations in our lab
  - Nutrient Film Technique (Zig Zag)
  - Deep Water Culture (Tent)
  - Aquaponics (Fish)
  - Aeroponics
  - Vertical Garden
  - Deep Water Culture (Buckets)
  - Flood Table

Lab Essentials

- Nutrient Film (NFT)
  - Water is stored at the base of the pipes in a reservoir
  - It is pumped up to the top of the pipes then flows back to the reservoir
  - The plants are held in net pots in the designated holes in the systems
  - Nutrient water constantly flows over the root systems

Lab Essentials

- Deep Water Culture – Tent
  - The tent is the only system that has something resembling dirt
  - We use coconut fiber to provide structure for the roots
  - The water is stored in a reservoir outside of the tent
  - There are specially designed pumps at the base of each bucket inside the tent
  - Because the light is inside of the tent, the tent itself can be a lot warmer than the rest of the lab
  - Plants love that!

Lab Essentials

- Aquaponics (Fish)
  - This is the only system that never gets nutrient water
  - The fish tank provides all of the nutrients that the plants need
  - It is important that the aquaponics team checks their aquarium levels each and every class

Lab Essentials

- Aeroponics
  - Water is held in a reservoir at the end of the table
  - Roots of each plant are mist fed nutrient water
  - Any excess water drains back into the reservoir
  - This system can have a buildup of salt deposits
  - As the roots are easily watered, this is an excellent system for baby plants

Lab Essentials

- Vertical Garden
  - The VG has the most space for plants in the entire lab
  - Water is held in the base of the system and pumped to the top
  - Water then drains back through the different levels
  - If the power goes off, the VG is the only system that will not restart itself

Lab Essentials

- Deep Water Culture (Buckets)
  - The buckets can be one of the more challenging systems in the lab
  - It is important that whomever is running this system checks on it regularly
  - Water is pumped up to the drip ring using an air pump
  - The nutrient water is dripped down onto the roots of the plant
  - As the nutrient water may get on the leaves, it is important that the plant is big enough to get above the drip ring

Lab Essentials

- Deep Water Culture (Flood Table)
  - Water is pumped from a reservoir underneath the flood table
  - The table must be run for a short time each day to maintain the water level on the table
  - This system has a removable structure built by a former student to provide structure to larger plants