Selecting a Hydroponic Unit

For an educator, a hydroponic garden is an innovative tool that helps deepen students' understanding of plant needs. Hydroponic systems allow young gardeners to explore different ways to meet plants' needs outside of natural systems. Additionally, as urban populations rise and available farmland decreases, hydroponic set-ups are being explored as possible solutions to produce more food with fewer resources than traditional farms. For example, some hydroponic systems use water and labor more efficiently than in-ground plantings and decrease the travel distance and time needed to reach consumers. Introducing students to hydroponic growing systems gives students hands-on experience with some of the latest technological advances in the field of production horticulture.

To a student, a hydroponic garden is just plain fun. Kids (and adults) of all ages marvel at growing plants in non-traditional ways. A hydroponic growing unit can allow for gardens in spaces that are not normally optimal for plant growth, such as small classrooms, balconies, or courtyards – or even rooms without windows. Hydroponic gardens are engaging, flexible, and can get kids hooked on growing plants.

Although there are many ways to create hydroponic growing systems using do-it-yourself techniques, prefabricated hydroponic systems are becoming more readily available. Many of these set-ups are affordable and easy to use and can be a great way for beginners to dip their toes into hydroponics while saving time for educators with busy schedules. That said, with hundreds of different systems available, it can be a bit overwhelming to choose one.

Here are some tips for choosing a prefabricated hydroponic unit to best meet your needs, including budget and available space. Consider the following:

- **Access to electricity:** Plant roots need access to both water and air. Some hydroponic units provide for those needs using air pumps submerged in water; others circulate water to roots – and both options require electricity. Interruptions in the power supply can lead to plant demise very quickly (especially in hot conditions), so the power source must be continuous and secure.

- **Light availability:** Just like their soil-grown counterparts, hydroponically grown plants need sunlight or artificial light to enable them to make food through photosynthesis. Many prefabricated units designed for indoor spaces have their own lighting systems; others can be placed under regular grow lights. There are also hydroponic units designed to be used outdoors to take advantage of natural sunlight.

- **Source of water:** In hydroponic systems, plants not only meet their water needs through the water supply but also must get all their nutrients via the water as well. The water quality and quantity are even more critical for hydroponically grown plants than for those grown in soil because there is less room for flexibility. Since most hydroponic units are very water-efficient, a nearby source of water may not be quite as critical as it is for a regular garden; however, it certainly makes the gardeners' job simpler if water is easy to access and transport. Many hydroponic units require you to use distilled water or, if using tap water, it must be allowed to sit overnight to allow the chlorine to dissipate before adding to the system because plants and nutrients can be sensitive to chlorine and its effect on pH. Another consideration, especially indoors, is to make sure to protect surfaces and objects around the unit in case of an accidental water spill.

- **Space:** Prefabricated hydroponic units come in a wide range of sizes. Some are small enough to fit on a countertop, and others can fill an entire room or greenhouse. Some units are designed to be used indoors; others are designed to weather the elements outdoors. Plants in hydroponic units often grow faster than in-ground plants, so it is best to place the units in a location that students can visit and observe daily.

- **Nutrients:** Some hydroponic units come with pre-mixed nutrients that can be poured into the unit without much thought. Others allow you to mix your own and require a regular check of the system's pH. Time available, budget, and involvement of students can be factors when deciding what nutrients to use.

- **Cost:** Prefabricated hydroponic systems vary greatly in price. Some units can be obtained for as little as $20, whereas larger units can run in the thousands. For a trial run, it may make sense to invest in a smaller unit to use for pilot programs. This can help you better determine what size unit best fits your future needs.

- **Production goals:** Another important consideration is to match the hydroponic unit with your production goals. If you are just growing plants with one class and hope they can engage in a taste test, a smaller unit with lettuce or herbs will suffice. If you are working with a whole school and/or you hope to have each child enjoy a salad or supply a cafeteria salad bar, then a much larger unit is needed. As with any youth garden, the advice to start small but dream big applies. Make sure you are being realistic when matching your goals and timing with the unit's capacity.

Examples of Prefabricated Hydroponic Units

AeroGarden: Indoor tabletop units that come with their own light source. Very easy to maintain and to start plants from seed.

Lettuce Grow: Tall, free-standing units that can be used indoors or outdoors (lights are an optional addition for indoor units. Large water storage capacity. Fill with seedlings rather than starting from seed, especially for outdoor units.

Additional Resources:

Exploring Hydroponics Curriculum: https://kidsgardening.org/resources/curricula-books-discovering-hydroponics/

Best Crops for Hydroponics: https://kidsgardening.org/resources/growing-guide-best-crops-hydroponics/

Starting Seeds for Hydroponics: https://kidsgardening.org/resources/digging-deeper-starting-seeds-for-hydroponics/