Hydroponics and Aquaponics: Know How to Grow

Tips & Tricks for Starting Out

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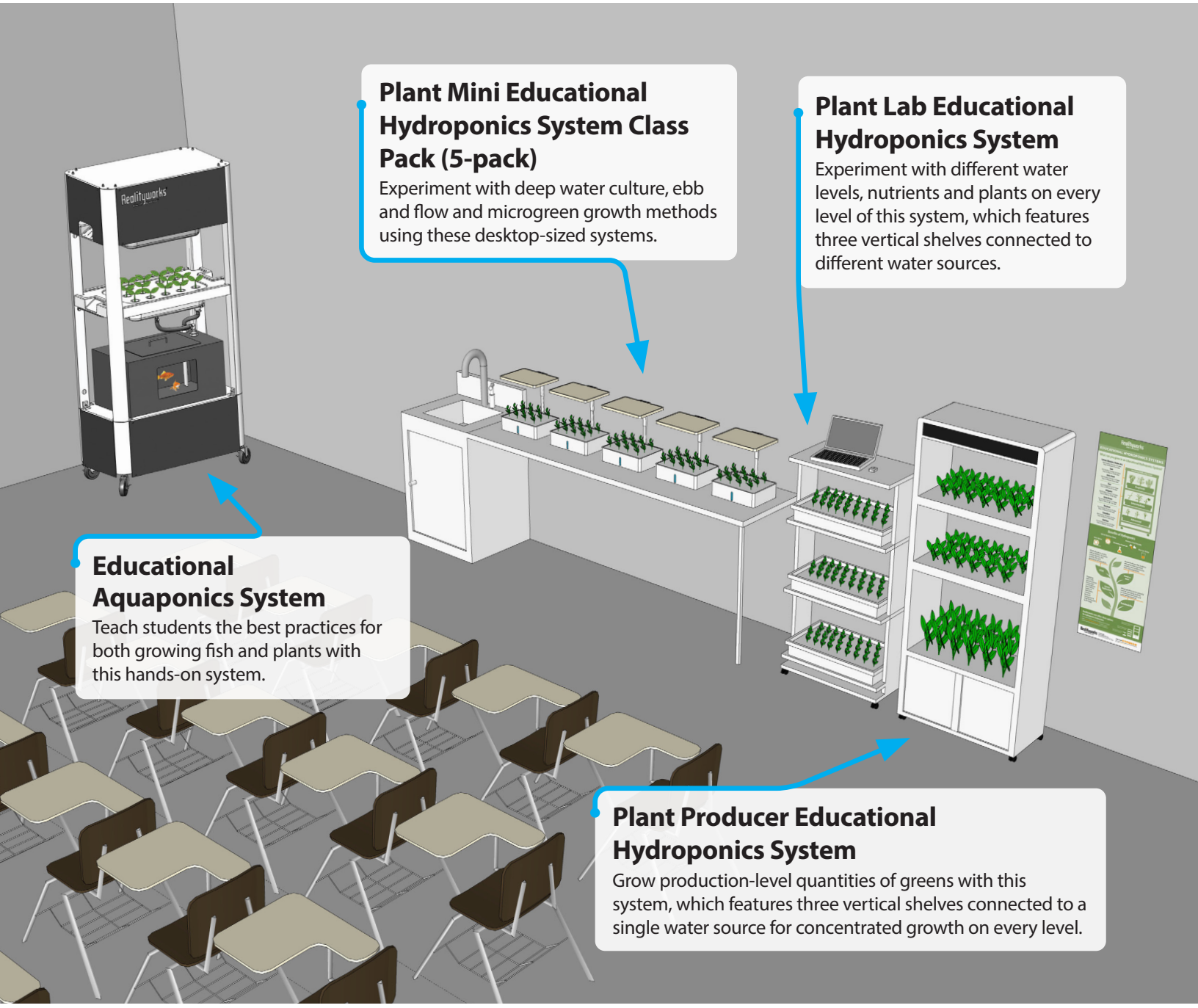
Getting started with hydroponics and aquaponics

Considering hydroponics or aquaponics for your school or classroom? Use this guide to gain an understanding of how to use these systems in any program.



Hydroponics is a method of growing plants in water without soil.
The water uses a nutrient solution to feed the plants and help them grow. This growing method can help plants grow to full-term faster, generate larger harvests, and create healthier plants.

Aquaponics is a method of growing plants hydroponically with fish.
The fish waste provides nutrients for the plants, and the plants purify the water for the fish. Aquaponics is an efficient, sustainable, and highly productive way of growing plants. It also provides a great example of biological cycles for students.

How to get started

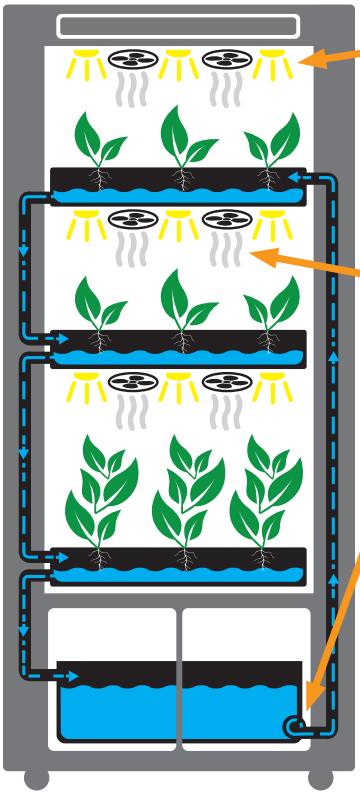
Materials needed:

Seeds, Rockwool, Growing tray, Nutrients*, Fish**

* Hydroponics only

** Aquaponics only – we recommend goldfish, catfish, or tilapia

Hydroponics



System parts:

Lights
The LED light array mimics sunlight (including the red-and-blue light spectrum) to help the plants grow.

Fans
The fans help strengthen and reduce injury and disease to the plants. They always run at a consistent speed.

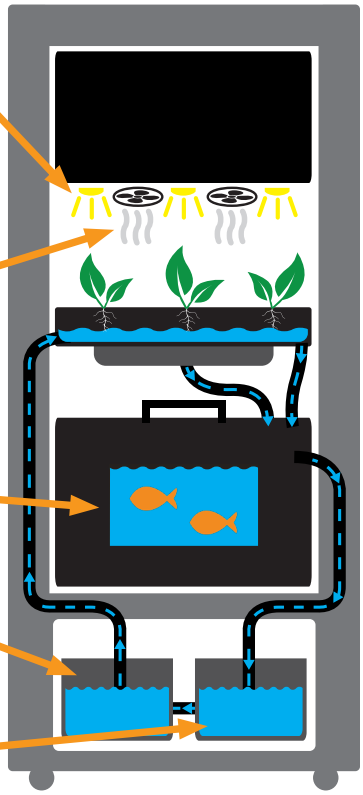
Water pumps
The water pumps circulate the water so that vital nutrients can move to the plant roots.

Fish tank
The fish tank houses the fish, which provide nutrients to the plants.

Solid waste tank
The solid waste tank catches uneaten food and other solid waste material.

Biofilter tank
The biofilter tank changes the ammonia waste from the fish into a healthier compound.

Aquaponics



Grow chart

Be aware of the average germination times for plants. Start the germination tray, then set up the hydroponics or aquaponics system while the seeds are germinating. Below is a list of average timelines for growth of popular plants.

Planting and Harvesting Cheat Sheet			
Plant	**Direct Light Needed**	**Germination**	**Days to Maturation**
Cabbages	Yes	4-10	65-85
Cucumbers		6-10	55-65
Green Beans		7-14	80-100
Kale	Yes	3-10	55-80
Leeks	Yes	7-12	80-90
Lettuce	Yes	4-10	35-65
Radishes	Yes	3-10	50-60
Swiss Chard	Yes	7-10	55-65
Tomatoes		6-14	55-90

BEFORE HARVEST: Start growing new seeds 7-10 days before harvesting the plants. This will allow movement of new plants from the germination tray directly to the hydroponics or aquaponics system without many or any days between harvest and new growth.

Benefits of hydroponics and aquaponics

Saves space

Depending on your system, you can grow four times the number of plants in the same space you would use to grow plants in a traditional soil method.

Uses less water

Growing plants in water actually uses 90% less water than traditional soil farming.

Speeds up grow times

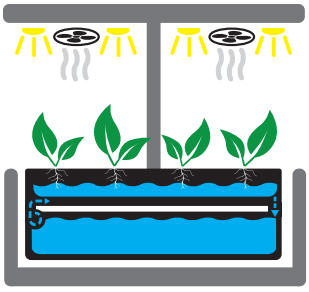
Some plants can grow twice as fast in a hydroponics or aquaponics system thanks to the system's precise delivery of water, nutrients, and oxygen.

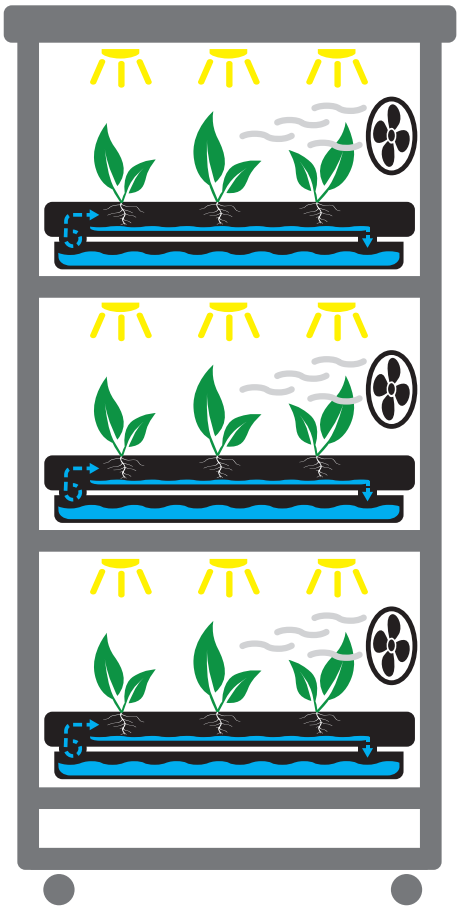
Eliminates chemicals

These plants do not need pesticides, which makes the crop safer to eat and is better for the environment.

Increases food security

Hydroponics and aquaponics allow for year-round growing and harvesting, no matter what the weather does outside. This allows for food security in any climate.



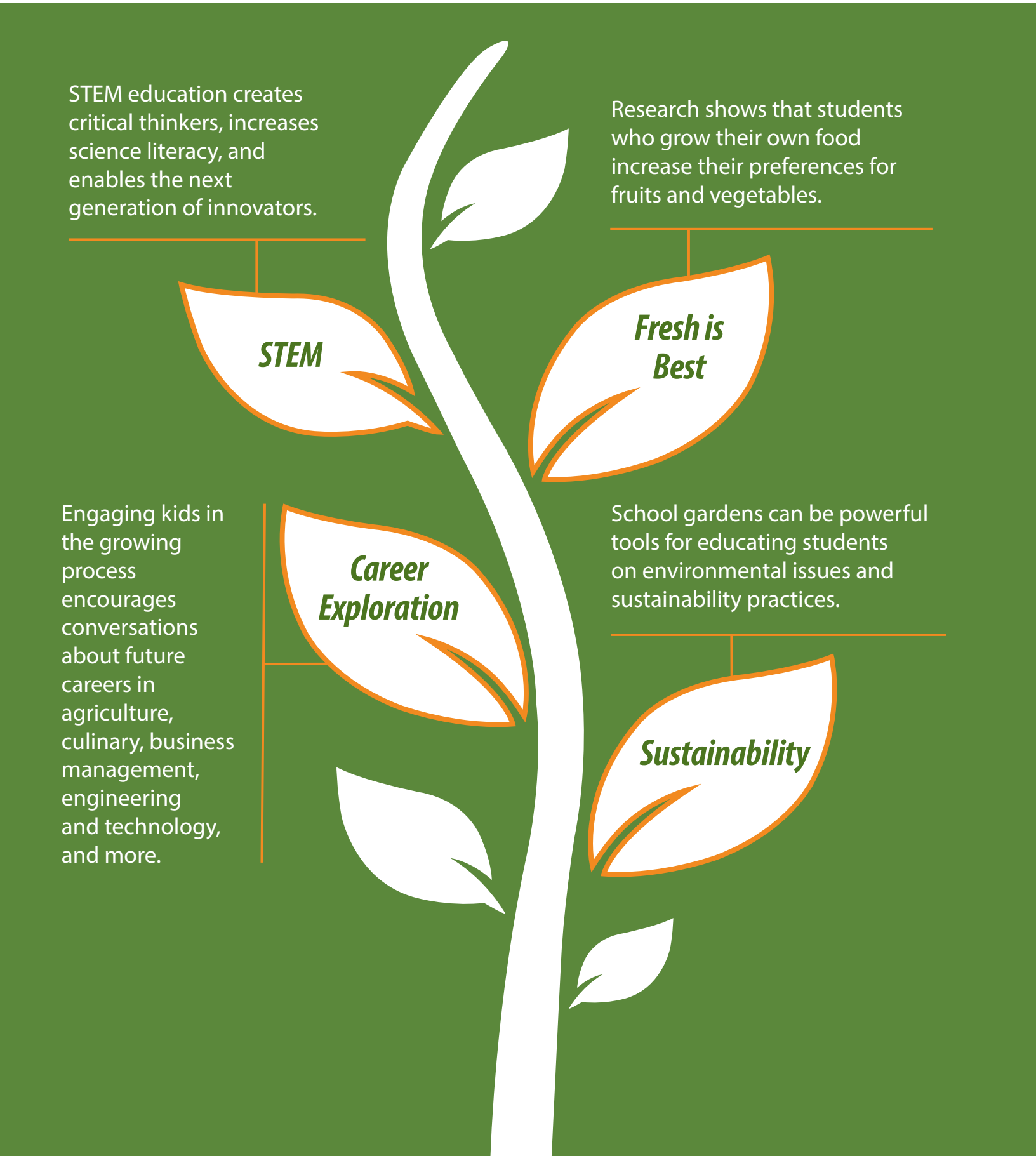


"The hydroponics unit helps my students to experience watching plants grow, regardless of the season. This has been one of my favorite pieces of equipment in middle school."

Brenda Collins, Agricultural Education, Wheatmore Middle School, Trinity, NC

Grow your food. Grow your mind.

How growing plants can increase student engagement



Hydroponics and aquaponics options from Realityworks

Plant Producer Educational Hydroponics System

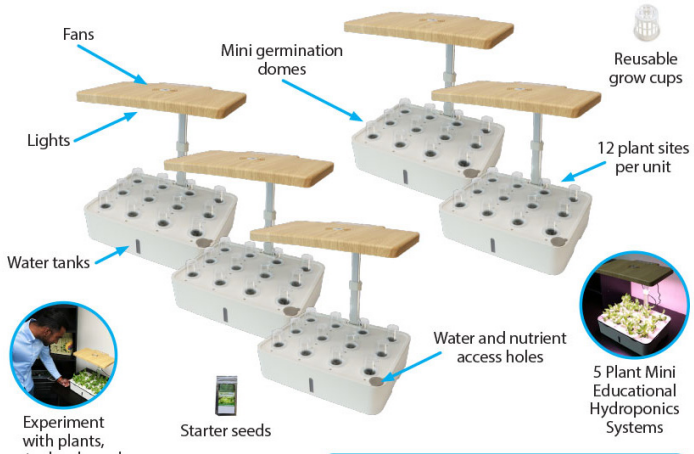
Additional features and functions:

- Experiment with plants, water levels, and nutrient levels
- 42 plant sites
- Guide to growing plants

Plant Lab Educational Hydroponics System

Additional features and functions:

- Experiment with plants, water levels, and nutrient levels
- Guide to growing plants



Plant Mini Educational Hydroponics System Class Pack

Additional features and functions:

- 3 hydroponic growing methods: deep water culture, ebb and flow, and microgreen
- Guide to growing microgreens
- Guide to growing with deep water culture or ebb and flow
- Nutrient recommendations

Educational Aquaponics System

Additional features and functions:

- Removable parts are easy to clean
- Allows you to view the fish, filtration, and fertilization process
- Downloadable curriculum

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