NextWaveSTEM

Hydroponics Systems: Gardening Without Soil

Designed for learners in Grades 3-5

Course Description:
This introductory hydroponics course for grades 3-5 spans 15 lessons, introducing students to fundamental concepts. Including plant growth, germination, photosynthesis, hydroponics, pH, food sustainability, & future plant systems. Students will plant seeds in a hydroponics garden, culminating in designing a solution to a community or global problem.

Equipment, Curriculum, and Training Available:

- 15 Lesson Hours
- Curriculum and supporting materials
- Ongoing product and curriculum support
- Professional development
- Facilitation by a trained STEM instructor (optional)

LESSONS	LEARNING TARGET EXAMPLES
1: What? No Soil? Introduction	Understanding the basics of hydroponics. Why hydroponics? Identify benefits and challenges
2: Let's Get Scientific! Plant Growth	Parts of plants, plant roles and requirements and photosynthesis overview
3: Let's Do It: Setting Up The Hydroponics System	Necessary components, overview of the types of systems, purposes, preparation and planting.
4: Let's Be Picky: Hydroponics Crop Selection	Which plants? Comparing, germination vs direct planting
5: Taking Care: Monitoring Plants	Monitoring the Hydroponics system
6: Don't Be A Pest: Insects	Pesky, Pesty Bugs. Identify, Benefits & Solutions
7: The Circle Of Life: Plant Cycle	Life Cycle and stages of plants + reproduction
8: Water Is Life: The Role of Water	Learn more about water, climate change & roots: The water carriers in plants—purposes, functions
9: Be A Scientists: Test Variables	Threats to photosynthesis and plants
10: Farm To Table: Issues & Harvesting	How to harvest crops and solutions to hunger
11: Are There More? Exploration	Design a hydroponics system to solve a problem
12: Out Of This World	Hydroponics system for a space station—for infinity and beyond!
13: What's The Buzz?	How aeroponics and aquaponics work, advantages and disadvantages. Floating Gardens
14: Helping the Environment	Advantages of plants and trees for the environment and the world
15: The Future of Hydroponics	What the future holds in hydroponics using Technology and AI