

Hydroponics: Growing Without Soil

This engaging STEM-based project introduces students to the science of hydroponics—a method of growing plants without soil. Students will use a classroom hydroponics kit to observe plant growth, explore alternative agricultural systems, and make real-world connections to sustainability, food security, and environmental impact.

Aligned with Oklahoma Academic Standard 5.LS1.1, this project allows students to support claims that plants primarily obtain materials for growth from air and water. They will directly observe plant development in a hydroponic system and compare it with traditional soil-based methods.

Jessica Batten

Grade level(s) impacted: 5th

Grant classification (subject): Science

Number of students impacted, 25-26: 85

How many years do you expect the project materials to last 1

Purpose of the project and benefits anticipated for classroom/school Many students have never seen alternative growing methods or considered sustainable agriculture. This project provides exposure to real-world applications of science and promotes innovation, environmental responsibility, and food system awareness. It also supports students who learn best through hands-on experiences.

Specific methods you will use to teach the above objectives Students will work in small groups to assemble and maintain hydroponic growing systems using materials from the home Science Tools Hydroponics Kit. Over several weeks, students will document plant growth, measure nutrient usage, and answer key scientific questions:

Can plants grow without soil?

How do nutrient solutions support plant growth?

What makes hydroponic systems potentially more sustainable than traditional farming?

Using the included hydroponics kit, students will:

Set up a wick-based hydroponic system using provided materials.

Plant seeds in coconut coir and monitor growth without soil.

Use the graduated cup to measure and add nutrient solution.

Compare results with plants grown in soil (if available).

Record and analyze data weekly using journals and digital tools.

Each step encourages hands-on investigation, critical thinking, and connection to broader sustainability goals.

Amount (less tax): 180

Shipping & Handling: 8

Vendor: homesciencetools.com

Will there be any costs associated with the project going forward? No

If you answered yes, how do you plan to cover those costs? N/A

How will the success of this proposal be measured and reported back to BAPSF and the community? yes

Is this a request for technology or a facilities alteration/installation? No