HYDROPONICS GROWING SYSTEM

KEYWORDS

hydroponics | agricultural technology | urban farming | sustainable agriculture | food security

Hydroponic farmers and agricultural technologists grow plants without soil by using nutrient-rich water solutions. This method saves water and allows food to be grown in cities and regions with poor soil. Hydroponics can produce vegetables and herbs year-round inside greenhouses or vertical farms, reducing the need for transporting food long distances. Workers in this field develop systems to monitor nutrients, light, and plant health using sensors and automation. These green jobs are important for making agriculture more sustainable, especially as global populations increase and farmland becomes more limited. Hydroponic farming helps support food security and reduce the environmental impact of food production.

AGE RANGE
9-11 years

SMALL GROUPS
(3-4 students)

DURATION
45 minutes

CONNECTION TO SDG

MATERIALS

- Clear plastic containers (16 oz minimum)
- Net pots or small plastic cups with holes
- Growing medium (perlite, vermiculite, rock wool)
- Seeds (lettuce, herbs, or radishes work well)
- Hydroponic nutrients
- pH testing strips or digital pH meter
- Measuring tools
- Air pump with tubing (optional but recommended)

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sead : stem

Specific Measurements and Tools:

Water Requirements:

- Fill container with 12-14 oz of water (leave 2" air gap at top)
- Change water completely every 7-10 days

Nutrient Solution:

- General hydroponics ratio: 1-2 teaspoons of liquid nutrients per gallon of water
- For small systems: 1/4 teaspoon per 16 oz of water
- Mix nutrients thoroughly before adding to system

Measuring Tools Needed:

- pH Meter or Strips: Target pH 5.5-6.5 for most plants
- Measuring Spoons: For accurate nutrient dosing
- Graduated Cylinder or Measuring Cup: For water amounts
- TDS (Total Dissolved Solids) Meter: Optional - target 800-1200 ppm for leafy greens

Procedure:

1. Fill container with measured water
2. Add measured nutrients and mix
3. Test and adjust pH if needed
4. Place net pot with growing medium in container opening
5. Plant 2-3 seeds per pot
6. Monitor water level daily, top off as needed

Maintenance Schedule:

- Daily: Check water level, add plain water if low
- Weekly: Complete water change with fresh nutrient solution
- Bi-weekly: Test pH and adjust if necessary

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INSTRUCTIONAL GUIDELINES FOR FACILITATOR

- **Pre-measure nutrients for safety and accuracy**
- **Teach proper pH testing techniques**
- **Explain the science behind soilless growing**
- **Connect to agricultural technology careers**

LEARNING OUTCOMES

- **Understand soil less growing techniques**
- **Learn about agricultural technology careers**
- **Practice scientific setup and monitoring**

EXTENSION SUGGESTIONS

- Monitor plant growth over several weeks
- Research commercial hydroponic operations
- Calculate water savings compared to traditional farming