



Growing plants hydroponically in nutrient solution

Name: _____

Date: _____

Experiment #: _____

Hydroponics is a way to grow plants without soil. The plant roots get the water and nutrients they need from a liquid solution.

QUESTION

Can plants grow well using a nutrient solution instead of soil?

HYPOTHESIS

If a plant's roots are placed in a nutrient solution, then it will grow because it can absorb the water and nutrients it needs.



SAFETY

- Wash hands before and after.
- Do not drink the nutrient solution.
- Keep the experiment area clean.

MATERIALS

- 2 clear jars or plastic cups (500 mL or larger)
- Net pot, cup with holes, or foam collar (to hold plant)
- Hydroponic nutrient solution (or fertilizer made for hydroponics)
- Water
- Measuring cup
- pH test strips (optional)
- Lettuce seeds or another quick-growing plant
- Paper towel or rockwool cube (to start seeds)
- Ruler
- Notebook



PROCEDURE

1. **Seed germination:** Place seeds on a damp paper towel or in a rockwool cube. Keep moist until seedlings sprout and have 2–3 true leaves.
2. **Prepare the jars:** Fill each jar with nutrient solution. Follow the directions on the nutrient label for the correct mixing ratio. (Use plain water in a second jar as a comparison if you choose.)
3. **Set up the plant:** Place the seedling in the net pot or foam collar so the roots hang down into the solution. Cover the jar opening with foil or wrap to block light from the solution (this helps prevent algae).
4. **Place the setup** in a location with bright, indirect light or under a grow light.
5. **Observe daily:** Check the water level and add more solution or water as needed. Keep the roots submerged. Note any changes you see each day.
6. Continue for 1–3 weeks, recording observations and measurements.



TIPS

- Change the nutrient solution every 1–2 weeks.
- A pH between 5.5 and 6.5 is best for most plants.
- Keep the solution cool and out of direct sunlight.

OBSERVATIONS AND DATA

Day	Plant Height (cm)	Number of Leaves	Root Length (cm)	Water Level (cm from top)	pH (optional)	Observations (appearance, color, changes)
Day 1						
Day 3						
Day 7						
Day 14						
Day 21						

ANALYSIS

1. Did the plant grow in the nutrient solution? What evidence shows this?
2. How did the plant's growth compare to your hypothesis?
3. What did you learn about hydroponic growing?

EXTENSION IDEAS

- Compare growth using different nutrient strengths (half strength vs full strength).
- Test different types of plants (basil, spinach, green onions).
- Add an air pump to the solution and see if it changes growth (deep water culture).
- Research and design your own hydroponic system.



CONCLUSION: Write a short summary of what you discovered.