

GROWING ALGAE

➤ IN A HOMEMADE BIOREACTOR ➤

Name: _____

Date Started: _____

Date Ended: _____



OVERVIEW

In this experiment, you will build a simple bioreactor and grow algae. Algae are tiny aquatic organisms that use light to make their own food. They grow quickly and help produce oxygen.



MATERIALS

- 1–2 liter clear plastic bottle
- Air pump (aquarium pump)
- Air tubing
- Algae starter culture* (from pond water or culture)
- Water
- Plant fertilizer (no phosphorus) (e.g., 20-20-20) or algae medium
- Measuring spoons
- Light source (sunlight or grow light)
- Tape or sealant
- Scissors or craft knife

*Pond water may contain other organisms. That's okay—algae should outcompete most of them over time.



SAFETY

- Work in a clean area.
- Do not drink any materials.
- Wash hands after handling pond water.
- Be careful when cutting the plastic bottle.



PROCEDURE

- Build the bioreactor:**
Cut a small hole in the bottle cap. Insert the air tubing so it reaches near the bottom of the bottle. Seal around the tubing so no air leaks.
- Prepare the medium:**
Fill the bottle with water. Add fertilizer or algae medium (see guideline below). Mix well.
- Add algae:**
Add 10–20% algae starter culture or pond water.
- Start the air pump:**
Connect the tubing to the air pump. Turn it on low so the bubbles are gentle and constant.
- Place in light:**
Put the bioreactor in bright light (sunlight or grow light) 12–16 hours per day.
- Observe and record:**
Check your algae daily and record your observations.



MEDIUM GUIDELINE (PER LITER OF WATER)

Add 1/2 teaspoon of 20-20-20 fertilizer (no phosphorus) or use a complete algae growth medium as directed. Do not add too much—too much nutrients can cause other organisms to grow.



OBSERVATIONS

Day	Color (describe)	Clarity (clear, cloudy, very cloudy)	Algae Amount (none, little, some, lots)	Notes (odor, bubbles, other observations)



DATA & RESULTS

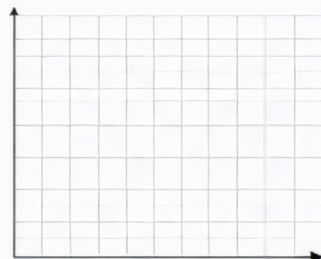
Make a graph of your algae growth over time.

Graph Idea:

X-axis = Days

Y-axis = Algae Amount

(none = 0, little = 1, some = 2, lots = 3)



ANALYSIS QUESTIONS

1. What did you notice about the algae over time?

2. What factors do you think helped the algae grow?

3. How could you improve your bioreactor?



DID YOU KNOW? Algae are used to make food, fuel, and even clean wastewater. You just grew a tiny piece of the future!