



Growing Bacteria Cultures on Homemade Agar Plates

Goal:

To make agar plates at home and use them to grow bacteria from everyday surfaces.

Background:

Bacteria are tiny living things that are all around us. Agar is a jelly-like substance that provides nutrients and a solid surface for bacteria to grow. By making our own agar plates and collecting samples, we can observe bacterial colonies.



MATERIALS

- 2 cups (480 mL) water
- 2 teaspoons unflavored gelatin
- 1/2 teaspoon agar powder (from health food store or online)
- 1 tablespoon sugar
- 1/4 teaspoon salt
- Saucepan
- Measuring cups and spoons
- Stirring spoon
- 2–4 heat-safe containers or glass jars
- Petri dishes (plastic, with lids)
- Alcohol wipes or rubbing alcohol
- Cotton swabs
- Tape and marker
- Zip-top bag or container (for incubation)



SAFETY FIRST

- Ask an adult for help when heating liquids.
- Do not leave the stove unattended.
- Let agar cool slightly before pouring.
- Do not open plates once inoculated.
- Wash hands after the experiment.
- This experiment is for learning purposes only. Do not ingest anything from the plates.

OBSERVATION TABLE

Sample Source	Day 1	Day 2	Day 3	Day 4	Day 5	Notes

Draw or describe the colonies you see each day (color, size, shape, number).



TIP: Different bacteria grow at different rates and may look different. Some may be tiny, some may be colorful, and some may look fuzzy or shiny.

Name: _____

Date: _____

Experiment #: _____



PROCEDURE

1. Make the Agar

- In a saucepan, combine 2 cups water, gelatin, agar powder, sugar, and salt.
- Stir well and let sit for 5 minutes to soften the gelatin.
- Heat over medium heat, stirring constantly, until the mixture is hot and everything is fully dissolved.
- Do not boil.

2. Pour the Plates

- Carefully pour the hot agar into heat-safe containers to make pouring easier.
- Pour about 15–20 mL of agar into each Petri dish.
- Gently swirl to spread the agar evenly.
- Let the agar cool and harden with the lid on.
- Label the bottom of each plate with the date and sample source.

3. Collect Samples

- Use a cotton swab to collect samples from different surfaces. Good places to try:
 - doorknob
 - cutting board
 - phone screen
 - keyboard
 - your hand (after washing and before touching your face)

4. Inoculate the Plates

- Gently rub the swab across the surface of the agar in a zig-zag pattern.
- Close the lid and tape it shut (optional).
- Repeat with a new swab and a new plate for each sample.

5. Incubate

- Place the plates in a warm spot (20–30°C / 68–86°F).
- Keep out of direct sunlight.
- Observe daily for 3–5 days.



ANALYSIS & QUESTIONS

1. Which surface had the most bacterial growth? _____
2. Which had the least? _____
3. What did the colonies look like? (color, shape, size) _____
4. What factors do you think affect bacterial growth? _____
5. What did you learn from this experiment? _____