

Fairchild Challenge #6

<https://fairchildgarden.org/high-school-challenge-6/>

DUE: 03/29/2026

1. Study the rubric and the assignment of the Challenge #6
2. Use the RUBRIC as a guide.
3. Research how plants grow at ISS
4. Research how water works at ISS, CO2 concentration, and LIGHT frequency at ISS
5. READ the Protocol to understand the experiment
6. Compare the data from Trial 1 and Trial 2
7. Explain our hypothesis and what is the conclusion
8. Use the template for the PP

➤ **IMPORTANT LINKS and TEMPLATES:**

PowerPoint Template:

https://docs.google.com/presentation/d/1HFDn_xsA-u1y2s7HHhWoR9xLpfYa70ZvfNYL3kDSta8/edit?slide=id.g39408202a29_0_45#slide=id.g39408202a29_0_45

Trial 2 Proposal:

Trial 2 Proposal (Fairchild Challenge 6)

Research Question

How does light intensity influence the growth and fruiting of GBE phenotypes #75 and #246 under simulated space-like conditions?

Observations from Trial 1

GBE #246 grew prosperously and began fruiting during the 10-week period under standard GBE lighting.

GBE #75 showed stunted growth and leaf burn under the same conditions.

These observations suggested that GBE #75 is more sensitive to light, and that intensity could be a limiting factor for its growth.

Hypothesis

GBE #246 will continue to grow successfully under the standard lighting used in Trial 1.

GBE #75 will show improved growth when exposed to reduced light levels.

Independent Variable

Light intensity (two levels)

- Level 1, GBE #246: 45 red, 0 green, 60 blue, 130 white
- Level 2, GBE #75: 38 red, 0 green, 52 blue, 110 white

Controlled Variables

(Kept constant for validity)

- Substrate type
- Nutrient solution
- Watering schedule
- Temperature
- Humidity

Materials:

All materials are part of standard GBE experiments.

Experiment Description:

In Trial 1, GBE #246 grew well and fruited under standard conditions, while GBE #75 showed stunted growth and leaf burn. These results suggested that light intensity may limit GBE #75's performance. We hypothesize that GBE #246 will continue thriving under the original lighting (45 red, 0 green, 60 blue, 130 white), and that GBE #75 will improve under reduced levels (38 red, 0 green, 52 blue, 110 white).