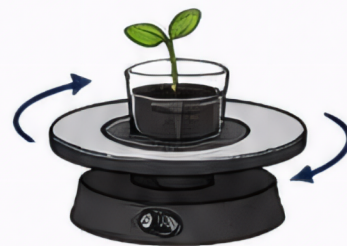




GROWING SEEDS IN ZERO-GRAVITY SIMULATION

— Using a Rotating Platform —



In space, microgravity affects how plants grow. This experiment uses a rotating platform to simulate **zero gravity (clinorotation)** and observe how seeds **germinate and grow** compared to plants growing under normal gravity.

QUESTION

How does simulated zero gravity affect the germination and growth of seeds?

HYPOTHESIS

If seeds are grown in a zero-gravity simulation using a rotating platform, then their growth direction will be less affected by gravity compared to seeds grown in normal gravity.

MATERIALS

- Fast-growing seeds (e.g., radish, mung bean, or cress)
- 2 identical shallow planting containers
- Potting soil or seed-starting mix
- Rotating platform (e.g., motorized turntable)
- Clear dome or plastic wrap (to maintain humidity)
- Timer or clock
- Ruler
- Notebook or data sheet (this page)
- Water spray bottle

VARIABLES

Independent Variable: Growth condition
(rotating platform vs. stationary)

Dependent Variables: Germination rate, stem length, root length, growth

Controlled Variables: Seed type, soil, water amount, light exposure, temperature, container type

PROCEDURE

1. **Prepare Containers:** Fill both containers with moistened soil.
2. **Plant Seeds:** Plant the same number of seeds evenly in each container. Label one "Rotating" and the other "Stationary".
3. **Set Up Rotating Platform:** Place the "Rotating" container on the rotating platform.
4. **Set Rotation:** Rotate the platform slowly and continuously at 1–2 RPM (revolutions per minute).
This helps simulate microgravity.
5. **Place** the "Stationary" container in the same location without rotation.
6. **Cover Both Containers** with a clear dome or plastic wrap to retain humidity.
7. **Keep Conditions the Same:** Provide equal light, temperature, and water to both containers.
8. **Observe and Record:** Check daily. Record germination and growth data for 7–10 days.
9. **Compare Results:** Analyze how the plants growing on the rotating platform differ from the stationary plants.



SAFETY NOTES

- Keep the rotating platform away from water.
- Do not touch the platform while it is moving.
- Ask an adult for help with electrical setups.

DATA TABLE (Record daily observations)

DAY	GERMINATION (number of seeds sprouted)		SHOOT LENGTH (cm)		ROOT LENGTH (cm)		GROWTH DIRECTION (toward gravity?)	
	Rotating	Stationary	Rotating	Stationary	Rotating	Stationary	Rotating	Stationary
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

CONCLUSION

What did you observe? Did the rotating platform affect how the plants grew? Why do you think this happened?



EXTEND YOUR LEARNING

Try different rotation speeds.
Test other types of plants.
Research how astronauts grow plants in space!