

Another FREE SAMPLE LAB from TOPS LEARNING SYSTEMS!

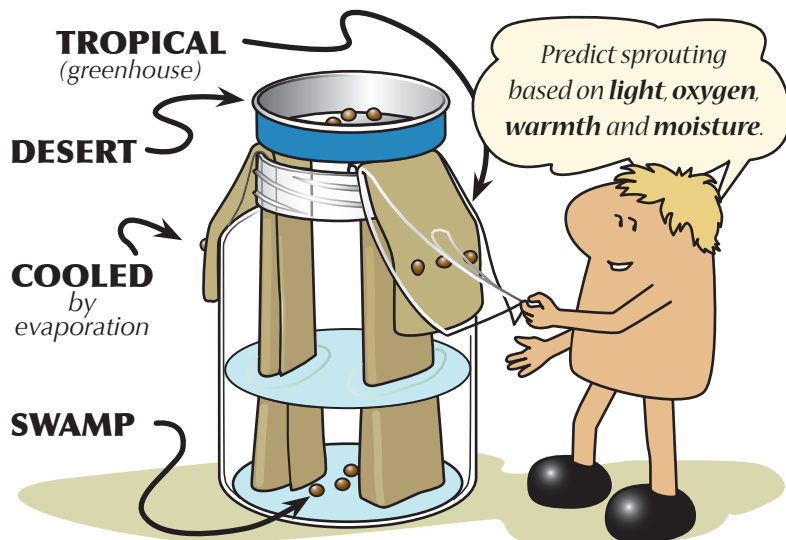
This TOPS Idea is taken from an original series of black-and-white line masters, adapted to stand alone as an independent mini-lesson. Please purchase our original book to get the whole in-depth program.

four environments

adapted by TOPS Learning Systems from
GREEN THUMBS: Radishes #38

1. Lay two folded strips of paper towel over the rim of a small jar, as shown.

2. Fill $\frac{1}{3}$ full with water, then lay a patch of plastic wrap over one of the towel surfaces.



3. Put three radish seeds into each environment.

4. Which seeds will germinate first? Last? Not at all? Predict, and explain your reasoning.

5. Record results in about a week. Any surprises?

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OBJECTIVE

To expose radish seeds to a variety of growing conditions, and predict outcomes.

LESSON NOTES

Make a photocopy of the activity above for each student or lab team.

Step 1. The towel hanging outside the jar must end higher than the water level, or it will siphon water out of the jar in a continuous drip.

Step 2. The plastic film should be only as long as the towel to avoid the siphon effect.

Step 3. The small seeds will cling to the wet towel. Dry fingers make this step easier.

Step 4. Our book **Green Thumbs: Radishes #38** discusses moisture, oxygen, and warmth available in each environment. Even without this background, students can predict and learn from the results they see over a few days. Radishes sprout quickly!

MODEL ANSWERS

Typical results for seeds not exposed to direct sun:

Desert: No water, no germination.

Tropical: Seeds germinate and develop.

Cooled: Sprouting unlikely unless room is unusually warm and humid (*or seeds are warmed by long periods of direct sunlight*).

Swamp: Some seeds may sprout, but lack sufficient oxygen to develop normally.

EVALUATION

Q: A seed packet says "store in a cool, dry place." Why is this good advice?

A: Dry, cool conditions do not encourage germination, so the seeds can be stored longer. (*Warm, moist conditions slowly use up the seeds' stored energy, even if they don't actually sprout.*)

MATERIALS

- A paper towel, plastic wrap, and scissors.
- A small jar with lid (baby food jars work well).
- 12 fresh radish seeds.

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