Family edition

Seed Lab: One Change at a Time

Ages 11-14 · about 45 minutes, in one sitting

Your child grows the same bean in Seed Lab under different conditions, changing one thing at a time, and compares how much plant it makes.

What you need

- A computer or Chromebook with a current browser.
- The lesson link: mytekdev.com/try/seedlab?lesson=one-change-at-a-time&ref=fam-seedlab-4. No account, no email and nothing to install.

Before you start: try it once yourself

Open mytekdev.com/try/seedlab?lesson=one-change-at-a-time&ref=fam-seedlab-4. A short guide opens over the app. A bush bean is planted on a south window at 21 °C, with the ledger open and the helper watering it.

1. **The control.** Press `Next stage` until the Flowers chip lights up. Each press stops at the start of a stage, so it stops on Day 40: 0.91 g on the ledger.
2. **Back in time.** Drag the `Back in time` slider all the way left. Pick `Grow light, always on`: a message says the days after are grown again.
3. **Run it again.** Press `Next stage` to Flowers: Day 40 again, now 2.7 g.
4. **More runs.** Day 40 by light: north window 0.24 g, east window 0.50 g, grow light 16 hours 0.85 g, south window 0.91 g, always on 2.7 g, outdoors 7.6 g. Outdoors by pot: small 4.0 g, medium 7.6 g, large 12 g. On a south window by warmth: 16 °C 0.22 g (up only on Day 35), 21 °C 0.91 g, 26 °C 0.76 g. Pot and soil can only be chosen before planting, so for pot size use Start over and plant again.

> The moment that lands is the north window: the same bean, the same day, nearly the same height, and a quarter of the mass.

The ideas, in plain words

Light is what a plant makes its food with: more light caught, more sugar, more plant. In dim light a plant makes little sugar: its stem stays thin and its leaves few, even when it is nearly as tall. A small pot holds a plant back: across many studies, doubling the pot gave about 43% more plant. Warmth speeds growth up to a point; warmer nights also burn more of the day's sugar, and at 26 °C the bean in the app ends Day 40 a little smaller than at 21 °C.

Flowering in the app follows warmth, not light, so at the same temperature every light reaches flowers on Day 40, which makes it a fair place to stop. A run at a different warmth reaches it on a different day; compare those on Day 40 by the clock.

Common mistakes: changing two things at once; comparing on different days; reading height as size (on Day 40 the north window plant is 14 cm tall against 16 cm on the south window, with about a quarter of the dry mass). The app grows one model plant, the same way every time, so two children with the same settings get the same numbers. Real plants vary from seed to seed; a real bean in a bag beside the app shows that.

Do it together

1. Open mytekdev.com/try/seedlab?lesson=one-change-at-a-time&ref=fam-seedlab-4 together. A short guide opens over the app. Press `Next stage` until the Flowers chip lights up.

   > **You'll know it worked when:** It stops on Day 40. The ledger says about 0.91 g.

2. Drag `Back in time` all the way left, then pick `Grow light, always on`.

   > **You'll know it worked when:** A message says the days after are grown again.

3. Press `Next stage` again until Flowers lights up.

   > **You'll know it worked when:** This time about 2.7 g.

4. Try a north window the same way. Ask: why does light make so much difference?

   > **If you get stuck:** Drag Back in time all the way left again before you change the light.
   >
   > **You'll know it worked when:** About 0.24 g: nearly as tall, with a quarter of the plant.

Talk about it

Ask these while you work together. A child who has understood it can answer them without help:

- What one thing did you change, and what did you keep the same?
- Why compare on the same day?
- The north window plant is almost as tall as the south window plant. Why is its dry mass so much smaller?
- Which variable made the biggest difference?
- How do you know your test was fair?

> The third question is the real test: a child who says height is not the same as how much plant there is has understood dry mass.

For younger and older kids

Younger: For a younger child, compare the plants by eye and skip the numbers.

Older: For a teenager, test pot size outdoors and draw a graph.

Keep going

- Test the warmth: why is 26 °C smaller than 21 °C on Day 40, though the bean came up three days sooner?
- Pick a light and a pot size that together beat 12 g by Day 40. Is that still a fair test?
- Open Puzzles and solve Too deep?.

Bring it into other subjects

- Math: how many times bigger is the outdoor bean than the north window bean on Day 40?
- Real plants: grow real beans on two windowsills and measure them for two weeks; are they the same every time?
- English: write a lab report for one variable: question, prediction, method, results, conclusion.
- Careers: find out what a greenhouse grower controls, and why.

For your records

Ready to copy into an hour log, a portfolio or a transcript.

LESSON	Seed Lab: One Change at a Time
SUBJECTS	Life science
TIME	45 minutes
WHAT WE DID	Ran a fair test of how light, pot size or warmth changes a plant's growth, and graphed the results.
SKILLS PRACTICED	Fair tests; Plant growth; Graphing data

Activity sheet (optional)

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/seedlab?lesson=one-change-at-a-time

Essential question: What makes a plant grow bigger, and how do you test it fairly?

Warm-up: Name three things that might make one bean plant bigger than another. _____

1. **Vocabulary.** Variable, fair test, control, dry mass, environmental factor: write each in your own words.

2. **The results table.** The variable I changed: _____. Control: _____, _____ g on Day 40. Run 2: _____, _____ g. Run 3: _____, _____ g. Run 4: _____, _____ g. Draw a bar graph of the four runs.

1. Which variable made the biggest difference? Use your numbers.

2. How did you keep your test fair?

Quick check

Name: _____

1. In a fair test you change (A) everything (B) one variable (C) nothing

2. On Day 40 a bean on a north window had 0.24 g of dry mass, and on a south window 0.91 g. The variable was (A) water (B) light (C) the seed

3. On Day 40 the north window plant was almost as tall as the south window plant but had a quarter of the dry mass. Explain how that can be.

Answers

QUESTION	ANSWER	WHY
1	B	Changing one variable shows what that one variable does.
2	B	Only the light changed between the two runs.
3	Thin, with little food made	In dim light the leaves make little sugar, so the stem is thin and the leaves few and small: tall is not the same as heavy. "It got less light" alone is half.

If your state or umbrella school asks, this lesson covers NGSS MS-LS1-5.

Terms of use

This lesson was made by mytekDev. You may print and copy it for the children you teach at home, and change it for them. You may not sell it, share it with other families, or post it publicly.

The app this lesson uses is free and runs in the browser, with nothing to install and no account needed. It is at mytekdev.com.

© 2026 mytekDev. All rights reserved.