

# Plants: what do plants need to grow?

## Lesson at a glance

Open with dry cress seeds on your palm and collect ideas about what plants need. Model a fair test aloud, then groups choose light or water as their single factor, predict, and sort change/measure/keep-the-same cards on the fair-test-planner interactive. They plant matching cup pairs, place them in agreed light or dark spots, and record baseline looks on the Investigation Journal page. Close with a talk on what keeps the test fair over the coming days.

## Learning objectives

- Pose a testable question about one factor plants need to grow
- Plan a fair test: change one factor, measure growth, keep the rest the same
- Set up the investigation so results can be observed and recorded over days

## Before the bell – prep

Pre-portion equal seed packs (about 20 cress seeds per cup) and damp cotton-wool portions the day before. Decide the dark place (card covers or one cupboard shelf) and clear a bright windowsill. Set two or three water stations with tablespoons so groups are not queued at one jug.

**Materials**

| Item                                                          | Qty                                                               | Per   | Source             | Low-cost substitute                                                                                                                 |
|---------------------------------------------------------------|-------------------------------------------------------------------|-------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| cress seeds (default for multi-day classroom test)            | pre-portioned pack for two matching cups (about 20 seeds per cup) | group | supermarket        | mustard seeds (similar speed). Dried beans only as a slower alternative that may need one to two weeks to show clear differences    |
| clear plastic cups or small plant pots                        | 2                                                                 | group | supermarket        | clean yoghurt pots with drainage holes punched by an adult                                                                          |
| cotton wool or peat-free potting soil                         | 1                                                                 | group | supermarket        | damp kitchen paper folded into each cup                                                                                             |
| water jugs and measuring spoons (two or three class stations) | 2                                                                 | class | classroom          | two clean tablespoons used as shared water measures at opposite ends of the room                                                    |
| sticky labels and pencils                                     | 1                                                                 | group | classroom          | masking tape strips labelled with pencil                                                                                            |
| dark card or foil covers for dark conditions                  | 1                                                                 | group | classroom          | a closed cupboard shelf reserved for dark-test cups                                                                                 |
| Investigation Journal page                                    | 1                                                                 | pupil | provided printable | plain paper; pupils record question, prediction, change, measure, keep the same, day-zero look, and check plan from the board stems |

**Safety watch-point**

Wash hands after seeds or soil; no tasting seeds. Mop spills at once. An adult places cups in high cupboards if used.

### Teaching moves

- **Getting Started:** Show a handful of dry cress seeds only — keep the planting kit out of sight. Take hands-up ideas (light, water, soil, warmth, air) without correcting yet. Note any “plants eat soil” comments for later.
- **What plants need, and how we test fairly:** Teach fair test, factor and observation-over-time from the board table, then speak the one-minute model: change only light, keep seeds, cotton wool, cup and water the same, measure health and colour not height alone. Honour soil and warmth, then narrow today’s class choice to light or water.
- **Question and predict:** Seat groups of three or four first. Write the two stems on the board, give two minutes to choose light or water, then hear three or four predictions. Steer light groups toward greener and sturdier, not “taller”; stop anyone trying to change both factors.
- **Plan the fair test:** Drive the fair-test-planner interactive: drag the light path (change light, measure health, keep water/seeds/cotton wool), then flip quickly for water. Protect at least four minutes for every pupil to write change, measure and keep-the-same for their own factor on the Investigation Journal page.
- **Plant and set up the test:** Agree places first: bright sill, dark cover or cupboard, shared sill for all water pairs. Model one matching labelled pair at the front, then circulate. Check equal seeds and cotton wool, clear labels, and a single-factor change before any cup moves to its final spot.
- **Baseline observations:** Write shared look-fors on the board: greener or paler, sturdy or floppy, number of green shoots. Pupils record day-zero appearance, the one difference, and how they will recheck. Prompt: are the cups truly the same except for one thing?
- **Make sense of today's set-up:** Draw out unfair examples (different seed counts, one cup on a radiator, accidental extra water) and stress that “seeds have not sprouted yet” is an observation, not proof plants need light.

### What it should show

No growth difference today — baseline only. Over a few school days, light cups should look greener and sturdier than dark ones (dark seedlings may be pale, floppy or spindly). Watered cups should look healthier than barely damp ones. Odd results often mean unequal seed counts, mixed light for water pairs, or uneven moisture top-ups on light pairs.

### Misconceptions & interventions

- **“Plants eat soil, so soil matters more than light or water.”** — Honour the idea, then show the cotton wool: it holds water and roots; today’s fair test still changes only light or water so the class can compare results.
- **Pupils put both light and water in the Change column.** — Stop and ask: if both change, how will we know which one mattered? Drag one card back to Keep the same on the fair-test-planner interactive.
- **Light groups predict “taller” as the healthy result.** — Steer them to colour, sturdiness and overall health. Dark-grown cress can grow taller and spindlier, so height alone can mislead.



### Lesson 3

#### Differentiation

| Emerging                                                                                                                                                                                                                                                                                                                                              | Developing                                                                                                                                                                                                                                  | Proficient                                                                                                                                                                                                                                                                                 |
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| <ul style="list-style-type: none"><li>• Offer the ready questions: “Does the amount of light change how well cress grows?” or the water version, and sit with the teacher table to sort change / measure / keep-the-same before writing.</li><li>• Pre-portioned matching cups reduce counting load so they focus on the one factor change.</li></ul> | <ul style="list-style-type: none"><li>• Ask why their prediction fits the factor, and have them name one thing that would make the test unfair.</li><li>• Agree a simple green-or-pale scale the group will reuse on every check.</li></ul> | <ul style="list-style-type: none"><li>• Critique another group’s plan: is only one factor really changing, and is health judged the same way each day?</li><li>• Plan how light-group moisture top-ups stay equal so water does not become a second factor over the coming days.</li></ul> |

#### Cross-curricular hook

Link to Maths measures — same seed counts, same water spoonfuls, and comparable health checks each day.

