Lesson 3 · living-things

What Do Plants Need to Grow?

Lesson at a glance

Open with a windowsill puzzle — two pots, only one watered — and take guesses about what plants need. Drive the fair-test-planner interactive on the IWB as one shared light example (Change/Measure/Keep the same), then model a full inquiry cycle aloud with a demo pot. Groups then choose light or water, write a prediction on their FairTestPlanner page, plant cress on damp cotton wool in two cups, and set up the Day 1 growth record. The result grows over the coming days.

Learning objectives

- Plan a fair test by changing one factor and keeping the rest the same
- Set up a record to follow plant growth over several days

Before the bell — prep

Pre-portion seeds, cotton wool and water into one tray per group the night before so groups start straight away. Keep a separate teacher demonstration set for the modelled pot so you don't use a group's portion. Have cups (two per group) and labels ready, plus a dark press or cupboard the light-testing groups can use. FairTestPlanner sheets, one per group, kept aside until step 4.

Materials

Item	Qty	Per	Source	Low-cost substitute
cress seeds	1	group	supermarket	mung beans or fast-sprouting bird seed
cotton wool balls	1	group	supermarket	kitchen roll folded into the cup
clear plastic cups	2	group	classroom	clean yoghurt pots
water in a small jug	1	group	classroom	tap water
sticky labels and a marker	1	group	classroom	masking tape and a pen
ruler	1	group	classroom	the edge of the Investigation Journal marked in cm

Safety watch-point

Remind pupils to wash hands after handling seeds and cotton wool, and not to put any seeds in their mouths.

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Teaching moves

- **Plan Our Fair Test Together:** Drive the fair-test-planner interactive as a whole-class worked example testing light — this is watch-and-call-out only, so say clearly nobody writes yet. Have pupils call out where each card goes: light to Change, 'how tall the cress grows each day' to Measure, the other three to Keep the same. Head off anyone wanting to change light AND water at once: then we couldn't tell which one caused the difference.
- **Model the Investigation Cycle:** Use the demo pot to think aloud through the whole cycle: I wonder, I predict, I set up fairly, I'll observe over days. Lead your prediction with colour and sturdiness (green and strong vs pale and floppy), not just height — dark cress can stretch taller but pale. Stress the result won't appear today.
- **Plant and Set Up Our Seeds:** Hand out the FairTestPlanner now; hold one up and point to the prediction box and growth table. Make each group say aloud whether they're testing light or water before anyone plants. As you finish handing trays out, tell groups to start writing their prediction. Circulate and check each pair of cups differs in only one way.
- **Set Up Our Growth Record:** Show the growth table on the IWB and point to it so pupils find it on their own page — the grid below the prediction box, headed Day, Height (mm), Colour. Have them fill Day 1: date and a 'before' drawing of bare cotton wool. Agree a fair measuring rule: ruler held straight, measure the tallest shoot, and judge colour too.
- **What Do We Predict and Why?:** Display-only science-talk. Revoice predictions and link them to fairness: 'You kept the seeds and cotton wool the same, so if one grows better we can fairly say it was the light.' If a group says the dark cup will be shortest, flag gently that it may be taller but pale — we judge by colour and strength.

What it should show

Over the week, expect light-tested cress to be green and sturdy and the dark cup pale and weak — but watch the catch: dark cress often stretches TALLER and leggy as it reaches for light it can't find. So a group reporting their dark cup is tallest hasn't made an error; steer them to judge by colour and sturdiness, not height alone. Water-tested cress: the watered cup sprouts and the dry one stays bare.

Misconceptions & interventions

- **Pupils want to change both light and water at once to 'really see a difference'.** — At the planner interactive, show that if both change you can't tell which one caused the result. Drag only one card to Change and re-voice: 'one thing changes, everything else stays the same.'
- **Pupils think the dark cup will be the shortest because darkness stops growth.** — When modelling the prediction with the demo pot, explain dark cress can stretch tall but pale, living off the seed's stored energy. Lead them to judge healthy growth by colour and sturdiness, not height.

Differentiation

Emerging	Developing	Proficient
• Pair with the teacher table and give a partly-set-up tray (cups already labelled) so they focus on placing seeds and drawing the Day 1 'before' picture. • Offer a sentence stem for the prediction: 'I think the cup in the ___ will grow ___.'	• Ask the group to add a 'why' to their prediction, naming what they kept the same to make it fair. • Have them write a second observation column heading for 'sturdiness' alongside colour.	• Pose a fair-test critique: 'What if one cup had more cotton wool than the other — would the test still be fair?' • Ask them to predict whether the dark cup might trick us by growing tall, and how they'd spot it.

Cross-curricular hook

Tie to the Maths Measures strand — pupils measure shoot height in millimetres with a straight ruler each day and compare the growth over the week.