

GROWING PLANTS IN DIFFERENT PLACES

National Curriculum Science KS2 PoS Sc2: 3a, 3b

QCA Science Unit 3B: Helping plants grow well

Scottish 5–14 Guidelines Living things: Processes of life – Levels A, B

HOW TO GATHER THE DATA

This written activity can be used to stimulate lots of questions about the growth of plants for the children to investigate – for example: *How much water does a seed need to germinate? Can you plant a seed upside-down? What type of soil is best for growing seeds?*

A 'germination sandwich' is a very good way of observing plant growth. The balsa wood strips are glued on, but the Perspex is removable. The sandwich is filled with vermiculite (which is available from garden centres); this absorbs water, but contains no nutrients that would interfere with the investigation. Not much space is needed to store the sandwiches, and they cannot be overwatered, which is useful in the classroom. Photocopiable page 64 contains a detailed diagram with instructions on how to make a germination sandwich.

If many seemingly identical seeds are planted at the same time, they will not all grow to identical heights. Data from this experiment can be used to remind the children that seeds grown apparently under the same conditions often grow to different sizes, because each seed is different.

THE SCIENCE BEHIND THE DATA

The root and shoot of a new plant use the cotyledons of the seed as a food store until it can start making its own food – by photosynthesis, which requires light. Thus a seed will germinate in the dark, as it does not need a source of light in order to start growing. The bean plant in the dark cupboard grows tall because it is seeking light (phototropism) – but as there is none, it is not stimulated to produce the green pigment chlorophyll, and so cannot photosynthesise. The effect of this is that it grows spindly and weak and the leaves are yellow, not green. The seed in the fridge does not grow at all, because it is too cold for the seed to germinate.

The plants in the cupboard and the fridge show that temperature and light have different effects on the growth of a plant: a low temperature prevents the plant from growing at all; darkness prevents the plant from making its own food and growing healthily. Although questions 8 and 9 in the activity identify putting the plant in the fridge as a mistake in terms of fair testing, it can still be used to illustrate a scientific point: that a seed will not germinate without warmth.

Answers

1. The cupboard.
2. No, it looked yellow.
3. Because it grew taller trying to find the light in the cupboard.
4. The plants on the window and on the shelf.
5. Because they had similar amounts of light.
6. Accept sensible suggestions such as: roots prefer to grow in the dark, so they grow longer trying to find the dark; the plant is healthier so can grow a better root system.
7. Several answers are possible: use the same amount of vermiculite, the same watering patterns, similar-sized beans. The same light is not a correct answer, as this is the effect that is being changed. The ruler is the measuring instrument.
8. No.
9. The temperature was a lot lower in the fridge and plants need warmth to grow.