

Unit 2: Helping plants grow well – Growing plants

The objectives for this lesson are that students should be able to:

- Discover how fast plants can grow
- Plan and take part in a scientific investigation
- Present and communicate findings
- Understand that a plant needs leaves to grow well.



Starter

Note: Activities in this unit will take a month or more and should be set up as early as possible in the topic.

- Show the students a pot plant. Explain that it was once smaller, but it got too big for its pot. *I bought it a month ago and it was nice and small. Now look at it! It's bursting out of its pot. How has this happened? I haven't been feeding it. In fact, I tried it with scrambled egg yesterday and it didn't eat any of it! What's going on? How can it grow without food? How do you think you could find out?*

The challenge

Read the start of page 32 in the Student Book. Discuss the different ways the groups in Class 3 decided to record growth. *Why were these good – or not so good – ideas?* Give each group of students a small pot plant to look after for a month to see how much it grows. Ask them to think about what they will do.

What to do

If you want a table or graph from this activity, encourage the students to measure regularly. Let them record their measurements on a table – perhaps kept close to the plant – noting date of measurement and plant height.

What you need

- small pot plants with different numbers of leaves
- measuring sticks or tapes
- simple watering systems, e.g. use small containers to measure watering
- digital camera or a video camera with a timer
- a balance or scales

What to check

This is a fair test only if conditions like the initial size of the plants and where the plants are placed to grow are controlled. Make sure the students understand how important it is to take, for example, measurements from the same point or photographs from the same position and in a similar light. When pictures are imported into multimedia presentation software, setting slides to change automatically will give the effect of the plant growing. Ensure students measure from the same datum line all the time – this will probably be the surface of the soil.

Support

Discuss how the plants should be treated to make the results valid. Point out that treating plants differently will give different results. So will measuring different things – agree on a 'fair' measurement.

Extend

Expect all students to be able to point to the tallest and shortest plants; expect most to make cause and effect connections, e.g. we had the most leaves on our plant, which is why it grew well. Let some students weigh and measure their plants every day to give an accurate picture and produce a critical approach as to the validity of their results when measuring or weighing.

Some students might notice the way plants grow – the bigger the plant, the more plant material they add so they weigh more.

What did you find?

WS
14

The students should use the table provided on WS 14. They should record the number of leaves each plant has at the start of the experiment and then record their results every day.

Record

WS
15

Encourage the students to convert their recorded data into a graph. As a fallback, they could use Class 3's data given in the Student Book and on WS 15. The data is continuous – plants grow steadily – so it should be represented as a line graph. Line graphs are more appropriate to older students who already have a clear understanding of what a bar chart represents. You may choose to draw a line graph anyway, or you may work on their understanding of bar charts by

Other ideas

Plant races

Compare the growth of two different types of plant. Do different types of plant grow at different rates? Compare the growth of all the groups' plants. Consider awarding a prize for the plant that has grown the most.

Data logging

Use data logging to measure and record the conditions – light, temperature – that your plants experience.

If you connect a digital balance to your computer, you can use data logging to measure the mass of the plant as it changes over the month.

At home

WS
16

Students could take seeds, planted seeds or potted seedlings to grow at home. Arrange a day to bring them back to school. Compare their growth and growing conditions.

Ask students to complete WS 16 as homework.

Plenary

It is essential that students explain their discoveries. Observations are not enough. They should be linking them to their understanding, e.g. 'Our plant grew well because it had more leaves'. Remind the students of the predictions they made before starting the investigation. Were they right? Did they guess correctly that a plant needs its leaves to grow well?

drawing the results as a stick graph. Stick graphs bridge the bar chart/line graph gap. If appropriate, use the spreadsheet software to convert the table into a chart or graph.

Present

Ask the students to look at the chart or graph and 'tell its story'. *Once the plant was tiny, then...* Encourage them to write what they did and what they saw, including drawing the table of results and chart.

Let each group of students present their findings to another class. If they have taken photographs or video clips, encourage them to import these to show how the plant grew. They should also include their table of results and charts or graphs.

Can you do better?

Ask students to review how good their evidence was. How would they tackle the investigation differently if they were starting again?

Show the students Class 3's report on WS 15 and read it together. Do they notice that the results table shows a plant with three leaves, although there is no mention of this earlier in the report?

What do they think about this? Have Class 3 drawn the right conclusions from their results? What could they have done better? Ask the students to criticize the report.

Predict

Discuss the results and check that the students understand that the plant needs leaves to grow well. A plant will grow better and faster if it has plenty of leaves, so the advice should be to make sure the plant has lots of green leaves before you buy it.