Wonder Project

Plant Challenge

Module 4: Analyse

The first batch of microgreens should have reached its full potential. Use the data students have collected to help them understand what worked well and what could be improved for trial two. Continuing the 4 Ds, students will then design their farm of the future.

Use this overview as a reference as you go through Module 4 in the student Learning Hub with your class.

Week 4: 2-3 hours

Activity sequence

Lab 4.1: Data dig

Harvest trial one

Improve trial two

- Lab 4.2: Feeding nutrients
- Lab 4.3: Grow house glow-up

Lab 4.4: Design your farm of the future

Module outcomes

- Learn to analyse the data you've collected from trial one
- Understand the difference between qualitative and quantitative data
- Use your data insights to improve your second microgreen trial
- Build a better grow house
- Design your farm of the future

Resources

From your plant kit:

- Lab book (1 per rōpū of 4)
- Poster: From seed to harvest
- Poster: The 4 Ds

Lab 4.2: Feeding nutrients resources

- Spray bottle (1 per rōpū of 4)
- Funnel (1 per rōpū of 4)

Daily data resources

- Sensor kit

School to supply:

Lab 4.2: Feeding nutrients resources

- Something to strain nutrient solution

Lab 4.3: Grow house glow-up resources

- Material for the structure. This could be cardboard, plastic, or wood
- Large clear plastic bags/sheets
- Classroom resources including scissors, pens, hot glue gun and calculators

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Activity overview	What students will do	Teacher role	Ambassador role
Lab 4.1: Data dig Students think like mathematicians and use their observation and analysis skills to calculate, analyse and interpret data from trial one data to help improve trial two.	Analyse the data they've recorded from trial one to draw conclusions about how well they were able to control growth conditions. Students calculate the **range** of their quantitative data, **plot a line graph** to help them interpret results and find **correlations** between their quantitative and qualitative data. Students can use these data insights to improve microgreen trial two.	Explain the difference between quantitative and qualitative data and how they support each other. Help students calculate the range of their data sets and then plot a line graph.	Help students complete an analysis of how their first trial has gone to determine what they could optimise or refine in the next trial. Talk through real life examples of how you've used data in your STEM role, and why it's useful.
Harvest trial one Celebrate the success of the first trial by harvesting and taste testing the microgreens.	Harvest their first microgreen trial by snipping the stems 1cm from the grow mat. Rinse before eating. Share their microgreen variety with peers who chose to grow a different variety.	Help students snip their microgreens. Encourage students to share their microgreens so everyone can taste test each variety.	Encourage students to use their 5 senses to decide what they like/don't like about their microgreens. Ask them which variety they like best and why.
Improve trial two			
Lab 4.2: Feeding nutrients Finish the nutrient solution students made in module three and add to trial two.	In their rōpū, strain and dilute their nutrient solution, add to their spray bottle and spray onto microgreen trial two.	Help rōpū finish making their nutrient solution.	Encourage rōpū to use the conductivity sensor to test their nutrient solution. Ask them to think about what the result means.
Lab 4.3: Grow house glow-up Using the insights from their data and observation skills, students engineer a better grow house solution for their second trial.	In their rōpū, use the Q&A in Lab 4.3 to brainstorm how they can make their second grow house, and growing environment, better. Carefully read the instructions on building their second grow house and then build one per rōpū.	Support students through the Q&A in Lab 4.3. Talk to each rōpū about their ideas for improving their second grow house. Help them construct their grow houses.	Circulate rōpū and support them to construct their grow houses. Support discussions on how they can improve their grow houses and what factors will make the biggest impact. **Ask**: *Why have you chosen to make your grow house like this? How will your new grow house help to improve/control growing conditions?*

Activity overview

Lab 4.4 Design your farm of the future

Using knowledge built throughout the challenge, imagine and design a farm of the future that solves the problem of growing food sustainably.

This will be turned into a model.

What students will do

Use Plant Challenge knowledge and take inspiration from STEM innovators to brainstorm a farm of the future idea in their rōpū.

Sketch and label the design with unique features.

Teacher role

Before the activity, facilitate a discussion on different ways the students' farms of the future can solve the challenge question 'I wonder how to grow food sustainably?'

Ask: *Where is your farm located, what is your farm growing, what method are you using to grow your food, who are you growing your food for?*

For examples to support class discussion, refer to teacher support notes.

Ambassador role

Spend time with each rōpū discussing their farm of the future ideas and how they answer the challenge question 'I wonder how to grow food sustainably'

Support rōpū to utilise all the STEM skills they have learnt to think outside of the box in their farm of the future design.

Ask: *What sustainable solutions to food growth could you use in your farm? What technology would you include? For example, lighting or watering systems.*

Remember: Bring in recyclable materials for your farm of the future model!