Wonder Project

Plant Challenge

Module 1: Future farms

Explore the future of growing our kai using innovation and the power of STEM thinking. In this module your students will meet their ambassador, unpack their Plant Kit, and head outdoors to explore environmental conditions that affect plant growth.

Use this overview as a reference as you go through Module 1 in the student Learning Hub with your class.

Week 1: 2 hours

Activity sequence

Pre challenge survey

Video: Farm of the future

Get ready to grow!

- Meet your ambassador
- Unpack your kit
- Use your STEM smarts

How does food get to your table?

- Food for thought
- Lab 1.1: Carbon footprint champions

Explore and enhance our environment with technology

- Use your sensors
- Lab 1.2: Sensor time trial

Module outcomes

- Discover sustainable food practices
- Understand the concept of a carbon footprint and what impacts it
- Understand the way we grow, move and eat our food has an impact on the environment
- Use 'sensor' technology to monitor environmental conditions that help plants to grow

Resources

From your plant kit:

- Lab book (1 per rōpū/team of 4)
- Lab 1.2: Sensor time trial resources
  - Sensor kit (1 per class)
  - 12 AAA batteries (3 per sensor)

School to supply:

- Technology for the ambassador's PowerPoint presentation

Activity overview	What students will do	Teacher role	Ambassador role
Student and teacher pre challenge survey An important tool for us to improve the programme each year and continue our funding to keep the Wonder Project free for schools.	Each participating student should complete the Student pre challenge survey before they begin the Plant Challenge. Students can access the survey via the Survey Monkey link in the Online Learning Hub and follow the prompts to submit their responses.	Each participating teacher should complete the Teacher pre challenge survey before they begin the Plant Challenge. Teachers can access the survey via the Survey Monkey link in the Online Learning Hub and follow the prompts to submit their responses.	
Farm of the future Gets students ready for the Plant Challenge. Introduces big issues such as food security and highlights how innovators are creating smart, sustainable solutions for growing food using STEM skills.	Discuss the big question: 'I wonder how to grow food sustainably?' Understand their challenge will be to create a farm of the future. Watch 'farm of the future' video and get inspired by local innovators who are creating smart solutions to global problems. Take notes during the video that will help them later in the challenge.	Facilitate a brief 'I wonder' discussion. Before the video ask: "Have you ever wondered where your food comes from?". Spark students' curiosity by brainstorming what they already know about food production in Aotearoa and what they think could be done differently. Watch the video and then highlight the solutions local innovators have come up with (i.e. vertical farms, hydroponics etc). **Ask**: *Why do you think these solutions are sustainable?* Extend the discussion based on answers. Write keywords on the whiteboard.	Get students excited about the challenges they'll be tackling – including growing hydroponic microgreens, creating grow houses, and designing a farm of the future.
Get ready to grow			
Meet your Ambassador STEM professional shares their STEM career story.	Meet their ambassador, listen to their career story and ask questions.	Introduce the ambassador to the class and help set up their presentation. Facilitate questions.	Meet the class and share your career story presentation. Remember to leave time for questions! Use the tips provided in the Wonder Project video 'telling your story'.

Activity overview	What students will do	Teacher role	Ambassador role
Unpack your Plant Kit Unpack the kit and discuss what each item is for.	Help the ambassador unpack the Plant Kit. Discuss how each item may be used.	Facilitate questions as the kit is unpacked. *Refer to 'unpack your Plant Kit' in the teacher support notes.*	Help unpack the Plant Kit in front of the class with key students. Call up students to pull an item out of the box and ask what they think it is for. Explain how each item might be used.
Note: Collect your resources! Identify recyclable materials students will need for the challenge.	Write down a list of materials they need to collect for their microgreen trials, grow houses and farm of the future.	Advise students to start collecting the materials they'll use for later in the challenge. Make suggestions. *Refer to the teacher support notes for a full list of materials we suggest collecting.*	Support the class by discussing the properties and benefits of different materials.
Using your STEM smarts Introduce the key skills students will need to succeed in the challenge.	Brainstorm the skills they will need for the challenge in a short class discussion.	Lead discussion. Refer to the farm of the future video for context. Introduce skills such as creativity, problem solving, resilience, communication, and teamwork. Write each skill on the white board. Ask students what they think each one means. *Refer to the STEM skills list in the teacher support notes.*	Support discussion. Provide real life examples of using STEM skills in context. This could be a project, situation, or task you've experienced. Keep the example short – no more than 2 minutes.
Smile for the camera Start to think about what parts of the Challenge students would like to capture on film.	Document their Plant Challenge experience through video and pictures. Students will edit this footage into a short video. This video can be entered into a competition at the end of the Challenge to win a prize!	Support students to film their videos. **Ask**: *What story do you want to tell? How? What messages do you want to include?*	Support students to film their videos.
How does food get to your table?			

Activity overview	What students will do	Teacher role	Ambassador role
Food for thought Introduces students to the ways our everyday food choices contribute to climate change and challenges them to shrink their carbon footprints by making sustainable choices at lunch.	Participate in a brief class discussion to understand that everyone has a carbon footprint and we can alter the size of it through the actions we take and the choices we make.	Lead a discussion that introduces students to the idea that our everyday food choices affect our carbon footprint and have positive and negative consequences. *Refer to teacher support notes.*	Support class discussion. **Ask**: *What do you think a carbon footprint is?* Explain that when we burn and use fossil fuels for our own energy needs (food, clothing, heat, transportation) this releases greenhouse gases into the atmosphere – contributing to climate change.
Lab 1.1: Carbon footprint champions Students assess their lunches by completing the carbon footprint champions quiz. This will help them understand how their food choices contribute to their carbon footprint.	Explore the 'lifecycle' of their lunch by thinking about what their lunch is made up of; what their food is stored in; where it came from; and how much waste their lunch generates. Understand that their food choices contribute to their carbon footprint.	Get the class into a rōpū (team) of four. Guide them through the quiz activity. *Refer to the teacher support notes for alternative ways to complete this lab if not all students have lunch.* After the quiz, facilitate a wrap up discussion to help students reflect upon their scores; interpret the results; and think about changes they can make.	During the quiz, facilitate rōpū (team) discussion and help students think about their responses. There are no 'right' or 'wrong' answers. Dig deeper into the idea of food production and sustainability. Throughout the activity, highlight how buying local, and what's available in season will be better for the environment. After the quiz support the wrap up discussion. Encourage students to share and interpret their results. *Refer to teacher support notes.*
Explore and enhance our environment with technology			
Use your sensors Introduces the Plant Kit sensors and how technology can be used to measure environmental conditions.	Watch the 'how to use sensors' video. Discuss why it's important to measure the temperature, light and humidity levels of the microgreen growing environment, and whether its conductive, as well as your five senses.	Facilitate a discussion before starting the video to spark curiosity around the sensors. Help students understand what humidity and conductivity are. *Use teacher support notes for reference.* **Ask**: *Why is it important to measure growing conditions? Why do you think we need to measure the temperature/ light/humidity/ conductivity levels of our growing environment? Why is it important to also use our 5 senses?*	Reiterate the importance of working together to students by giving examples of how you do this in your own workplace. Outline the benefits of using technology to support plant growth. Use your STEM skills to support students by asking questions and encouraging them to use their 5 senses – sight, sound, smell, taste and touch as inquiry tools.

Activity overview

Lab 1.2: Sensor time trial

A hands-on activity to get students moving outdoors and get them familiar with the sensors.

What students will do

Get into their rōpū and discuss what part of the environment will give them the best reading with their allocated sensor.

Take turns racing against the clock to get the highest reading on their allocated sensor.

Teacher role

Pair each rōpū up with another rōpū to establish the challenge opponents.

Distribute one sensor to each pair of rōpū.

Note: *Students using the conductivity sensor will do the challenge differently. They will race to find the highest number of conductive objects.*

Support rōpū discussions on where to get their sensor readings from around the school and outline boundaries on where they cannot go.

After the activity, lead class discussion on the results.

Ask: *What did this rōpū measure to give them a higher number? Why do you think this gave them a higher number?*

Ambassador role

Before the activity, support rōpū discussions on the environmental conditions they could look for to get a high number.

After the activity, record class results on the whiteboard and pick the rōpū with the best results to explain their thinking.

Remember: Ask students to start collecting recyclables that they will use in future modules!

Wonder Project

Plant Challenge

Module 2: Grow

Dig deeper into the science behind plant growth, hydroponics, and the environmental conditions that plants need to thrive. Then, students will harness their new plant knowledge by sowing the seeds of their first microgreens trial and starting to collect daily data.

Use this overview as a reference as you go through Module 2 in the student Learning Hub with your class.

Week 2: 2 hours

Activity sequence

How do plants grow?

- Photosynthesis
- What is hydroponics?

Introducing microgreens

- Video: The microgreen lowdown

Let's grow

- Lab 2.1: Microgreen trial one
- Lab 2.2: Daily data

Module outcomes

- Discover what plants need to grow and the science behind photosynthesis
- Learn about microgreens
- Plant your first batch of microgreens
- Understand how to monitor plant growth

Resources

From your plant kit:

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

Lab 2.1: Microgreen trial one resources

- 5 x seed packets (1–2 teaspoons of seeds per rōpū of 4)
- Hemp grow mat (1 per rōpū of 4)
- Spray bottle (1 per rōpū of 4)
- Funnel (1 per rōpū of 4)

Lab 2.2: Daily data resources

- Sensor kit

School to supply:

Lab 2.1: Microgreen trial one resources

- Container with lid (1 per rōpū of 4)
- Classroom resources including scissors and pens

Activity overview	What students will do	Teacher role	Ambassador role
How do plants grow? Summarises the basic science of plant growth to prepare students for their own microgreen trials. Explores: • Photosynthesis; and • What is hydroponics?	Learn the basic conditions for plant growth and the science behind photosynthesis. Understand the hydroponic growing method and the part it plays in sustainable food practices. *Use the 'from seed to harvest poster' as a reference.*	Introduce students to the conditions that plants need to grow and photosynthesis. Lead a discussion on hydroponics and the part it plays in sustainable food practices. Use the 'from seed to harvest poster' to facilitate discussions on how this relates to microgreens.	Support the class if they wish to explore the science behind plant growth in more depth. Contribute to the discussion on hydroponics and how it supports sustainable food practices. **Ask**: *If they can't grow in soil, what do you think the plants grow in? Why do you think hydroponics is a sustainable way to grow food?*
Introducing microgreens Explains what microgreens are, how to look after them, and gives step by step instructions on how to plant the first trial. Video: The microgreen lowdown.	Learn more about microgreens and how to grow them successfully. Watch the microgreen lowdown video and take notes on how to plant their first trial.	Watch the microgreen lowdown video with students. Encourage them to take notes that will help them plant their first trial.	Get students excited about planting their first microgreen trial. Discuss the STEM skills students may need to grow microgreens and relate to own world of work. When planting the trials, help students figure out which seeds they'd like to grow. Then figure out the best seed density for growth – this will be different for each seed variety.
Let's grow			
Lab 2.1 Microgreen trial one Students plant their first microgreen trial supported by the video instructions and a summary of the steps in their lab book.	Get into their rōpū of four. Pick their microgreen seed variety. Follow the steps in their lab book to sow their seeds. Name and label trays with rōpū name and date. Place them in a sunny spot in the classroom – each seed variety needs sunlight once they germinate.	Get students into their rōpū. Help distribute the seeds, grow mat, spray bottle and funnel. Support the rōpū to plant their first trial according to the instructions in Lab 2.1. Remind them to mist their trays every day and always last thing on a Friday. *Refer to teaching notes and 'from seed to harvest' poster.*	Help distribute the seeds, grow mat, spray bottle and funnel to each rōpū. Circulate the class and support them to plant their first trial. **Ask**: *What do you think you'll discover in the first trial?* Encourage students to use their observation skills to take note of how well their plants are growing and how they could improve their yield. Explain what yield is. **Ask**: *Why are we using this hemp mat? Why are we putting a hole in the side of the container? Why do we soak our seeds? Why do we need to mist them every day?*

Activity overview

Lab 2.2: Daily data!

Get students into the habit of checking their plants and measuring their microgreen growing conditions daily.

What students will do

Rōpū gather qualitative and quantitative data from microgreen trial one.

To gather qualitative data, rōpū use their 5 senses to observe their microgreens and how they're changing each day.

To gather quantitative data, rōpū take turns to use each sensor to record the temperature, light and humidity levels of their microgreens, and whether the growing environment is conductive.

Write down the results in their lab book daily.

Teacher role

Distribute the sensors to each rōpū and support them to gather readings.

Discuss the difference between qualitative and quantitative data and why it's important to measure both.

Ambassador role

Encourage students to think about why it's important to continuously monitor the growing conditions of their microgreens.

Give students an example of how you might collect data at work, and why? How do you record your data and then display/present it for your boss/clients?

You could bring in one piece of equipment/ technology to demonstrate how you collect data.

Discuss when it's important to bring in qualitative research to a project. For example, consulting with Iwi, or end users for a project.

Remember: Bring in your recyclable materials and ingredients to make compost tea! You'll need them for the next module.

Wonder Project

Plant Challenge

Module 3: Flourish

It's time to think like an engineer to make those microgreens flourish. Students will use the '4 Ds' of Design Thinking – Discover, Design, Develop and Deliver to create and maintain the optimum growing environment. They'll also plant their second trial.

Use this overview as a reference as you go through Module 3 in the student Learning Hub with your class.

Week 3: 2-3 hours

Activity sequence

Unearthing the 4Ds

- Video: Discover

Lab 3.1: Build your grow house

Lab 3.2: Microgreen trial two

Lab 3.3: Making nutrients

Module outcomes

- Explore the 4 Ds of Design Thinking
- Think like an engineer to unleash the potential of your plants
- Build your first grow house
- Plant your second microgreen trial
- Start brewing your nutrient solution

Resources

From your plant kit:

- Lab book (1 per rōpū of 4)
- Poster: The 4 Ds

Lab 3.2: Microgreen trial two resources

- 5 x seed packets (1–2 teaspoons of seeds per rōpū of 4)
- Hemp grow mat (1 per rōpū of 4)
- Spray bottle (1 per rōpū of 4)
- Funnel (1 per rōpū of 4)

Daily data resources

- Sensor kit

School to supply:

Lab 3.1: Build your grow house resources

- Plastic container with lid (1 per rōpū of 4)
- Large clear plastic bags/sheets

Lab 3.2: Microgreen trial two resources

- Container with lid (1 per rōpū of 4)

Lab 3.3: Making nutrients resources

- Ingredients to make compost tea. We suggest things like banana skins, green tea, epsom salt, or baking soda
- Bowl, large bottle (i.e. milk bottle with the top cut off), or spare ice cream containers
- Classroom resources including scissors, pens, hot glue gun

Activity overview	What students will do	Teacher role	Ambassador role
Unearthing the 4Ds Introduces students to an engineering mindset and the 4 Ds of Design Thinking that they will use to maintain a successful and controlled growing environment for their microgreen trials and create their farm of the future.	Become familiar with the 4 Ds of Design Thinking.	Use the poster to prompt discussion on the 4Ds of Design Thinking. **Ask**: *What is important about the Discover/ Design/Develop/Deliver stage? Why is it helpful to go back and forth between each stage?*	Support discussion by giving real life examples of when you have seen or used this process (or similar) in your work. For example, the Engineering Design Process. Bring in examples to share.
Video: Discover Highlights some real-world examples of farms of the future using STEM to create controlled growing environments in wacky locations.	Discover that you can grow food sustainably, wherever and whenever you want by using innovative STEM solutions to create controlled growing environments. Watch video and get inspired for their farm of the future. Write notes.	Watch the video with students. After the video: **Ask**: *What do you think a controlled growing environment is? Why do you think this is important?*	After the video, outline how STEM thinking was used in the future farm examples. For example, engineering a growing environment to produce more crops in a confined space – vertical farming. Or, using technology and science to set up a controlled growing environment with special lighting, water, and heat systems.
Lab 3.1: Build your grow house Build on insights from the 'discover' video by making their first grow house to create a controlled growing environment for microgreen trial one.	Carefully read the instructions in their lab book. Then, build their grow houses in their rōpū of four and transfer their first batch of microgreens into a new home.	Help rōpū to build their grow houses. Encourage rōpū to think about the benefit of moving their first microgreen trial into a grow house.	Inspire students and discuss a time when you have used creativity and problem solving at work. Share examples or stories of when things go wrong. Discuss the benefits of setting up a controlled environment for greens and how real-life grow houses work.
Lab 3.2 Microgreen trial two Plant a second microgreen trial that will be used to test enhanced growing methods.	Pick their microgreen seed variety. Make small changes to seed planting method (e.g. sowing more/less seeds, soaking them for a longer period) and start thinking about other ways to improve the second trial. *Refer to Lab 2.1 to sow their second batch of seeds.* Name and label trays with date.	Help distribute the seeds and grow mat. Support the rōpū to plant and improve their second trial according to the tips in Lab 3.2 and instructions in Lab 2.1. *Refer to teacher support notes and 'from seed to harvest' poster for more detailed instructions on how to improve microgreen growth.* Remind them to continue to mist their trays every day and on a Friday afternoon.	Help distribute the seeds and grow mat to each rōpū. Circulate the rōpū and support them to plant their second trial. Encourage students to think about three things that went well in the first trial and three things to change in the next trial. **Ask**: *How well did the seeds grow? Were conditions too dry or too wet? Were the seeds overcrowded? Did they have enough light?*

Activity overview

Lab 3.3: Making nutrients

Learn about the benefits of adding nutrients to hydroponic growing systems.

What students will do

Create a nutrient solution made with their chosen ingredients, and water. Name and label solution with date.

Leave it to brew for a week.

Understand the benefits of adding nutrients to hydroponically grown plants..

Teacher role

Help students to make their nutrient solution.

Get each rōpū to present to the class what ingredient(s) they've chosen and why.

Ambassador role

Circulate rōpū and help students to make their nutrient solution.

Discuss why you need to add nutrients to plants when they're grown hydroponically.

Remember: Bring in recyclable materials for your second grow house and something to strain your nutrient solution!

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!

Wonder Project

Plant Challenge

Module 5: Innovate

The second microgreen trial should be almost all grown up. Use data to investigate which microgreen trial worked better, and how the growing conditions affected this result. Students will also bring their farm of the future design to life by continuing with the 4 D design process and creating a model.

Use this overview as a reference as you go through Module 5 in the student Learning Hub with your class.

Week 5: 2-3 hours

Activity sequence

Lab 5.1: Data dig 2.0

Lab 5.2: Develop your farm of the future

Trial trivia

Module outcomes

- Evaluate your two trial outcomes by analysing and comparing data
- Conclude which microgreen trial worked better and why
- Develop your farm of the future

Resources

From your plant kit:

- Lab book (1 per rōpū of 4)

School to supply:

- Lab 5.2: Develop your farm of the future resources

Recycled materials to create farm of the future model. This could include:

- Cardboard
- Kitchen rolls
- Coloured paper
- Pipe cleaners
- Recyclable plastic
- Classroom resources including scissors, hot glue gun, tape, ruler, decorative pens

Print:

- Trial trivia (1 per quizmaster)

Activity overview	What students will do	Teacher role	Ambassador role
Lab 5.1: Data dig 2.0 Form a conclusion on which trial worked better and why through data analysis.	Analyse the data they've collected from trial two in their rōpū. Calculate the **range** of their quantitative data sets, **plot a line graph**, and find **correlations** between their quantitative and qualitative data sets. They'll compare these results to trial one and form a conclusion on which trial worked better and why.	Support rōpū to analyse their data. Help students understand why it's useful to compare data to form a conclusion.	Circulate each rōpū and help them analyse their data sets. Give real life examples of ways to present conclusions based on how you do this in your role. Discuss the conclusions formed by each rōpū. **Ask**: *How did you arrive at that conclusion? What does each set of data show?*
Lab 5.2: Develop your farm of the future Make a farm of the future model to help explain students' STEM solutions to the challenge question.	Collaborate as a rōpū to build a model of their farm of the future using their designs from Lab 4.4. Each rōpū will decide whether they'll build a digital model or a physical model using recyclable material.	Encourage participation and teamwork amongst each rōpū. Ensure students are thinking about the features of their models and how they solve the challenge question.	Help students to build their models. Help students develop their farm design. Share ways you have modelled your ideas in your role and what the benefit is.
Trial trivia Tests students understanding of key concepts using a quickfire quiz.	Compete as a rōpū of four. Choose a noise to make when they know the answer.	Review students' knowledge of key concepts. Add extra questions to quiz to extend learning if you'd like.	As the quiz master, use the trial trivia sheet to ask the rōpū quick-fire questions. Have fun while encouraging fair play and respect.

Remember: If you are choosing to enjoy shared lunch in the next module, remind students to bring their carbon friendly lunches. You may choose any theme for the shared lunch.

Wonder Project

Plant Challenge

Module 6: Celebrate

Ka rawe! It's time for students to reap the rewards of their hard work. They've grown and harvested microgreens, created their own grow houses and designed and developed their farm of the future. Now let's reflect on the journey, share successes by delivering a presentation, and enjoy a shared lunch.

Use this overview as a reference as you go through Module 6 in the student Learning Hub with your class.

Week 6: 1 hour

Activity sequence

Lab 6.1: Deliver

Kai time

Spring fever

Share to win

Post challenge survey

Module outcomes

- Reflect on learnings
- Understand the benefits of homegrown food
- Share and celebrate

Resources

From your plant kit:

- Lab book (1 per rōpū of 4)

School to supply:

- Students to bring a plate for shared kai

Print:

- Spring fever take home sheet (1 per student)
- Participation certificate

Activity overview

Lab 6.1: Deliver

Reflect on learning to date in a short class presentation.

What students will do

Spend time structuring their presentation, guided by prompts in Lab 6.1.

Deliver their farm of the future model idea to the class as a rōpū in a short presentation. Explain how it answers the challenge question.

Receive certificate after presentation to celebrate participation in the Plant Challenge.

Teacher role

Allocate time for students to structure their presentations in rōpū.

Pick the order of rōpū presentations and ensure students are engaged and listening while others are presenting.

Facilitate a Q&A after each rōpū presentation.

Hand out certificates.

Ambassador role

Support rōpū to structure their presentation. Share your tips and tricks for presenting and good communication.

Ask questions and provide guidance to further learning.

Ask: *How does this feature help grow food sustainably? Why have you chosen this location?*

Activity overview	What students will do	Teacher role	Ambassador role
Kai time Shared lunch to reflect on learnings and celebrate finishing the challenge.	Students bring in a plate that incorporates something they've learnt. For example, a low carbon meal or something that uses their microgreens.	Help coordinate the shared lunch and celebrate with students.	Support the teacher to coordinate the shared lunch. Ask students to explain why they chose the dish they brought.
Spring fever Optional take home activity for students to continue Plant Challenge learning over the summer holidays.	Choose one activity from the take home sheet to complete over the holidays. Take pictures/write diary entries about the activity to share with family and whanau over the school holidays.	Distribute activity sheets by printing/emailing to students or parents.	
Share to win Make and share a short video of the Plant Challenge experience to win a prize.	Plan, film and edit a creative video that captures the Plant Challenge experience.	Support students with filming and editing their videos. Upload their video to YouTube/Vimeo and send to the Wonder Project team.	Encourage students to reflect on their Plant Challenge experiences and think about which parts they want to include in their video. **Ask**: *What did you like most about this challenge, and why? What was most challenging or least interesting about this challenge? How did you work as a team? What problems did you have to solve? What STEM skills did you use throughout the challenge...* Support students with filming their videos.
Student and teacher post challenge survey An important tool for us to improve the programme each year and continue our funding to keep the Wonder Project free for schools. We supply teachers with the survey data from their school which will show the impact the Plant Challenge has had on students' perceptions towards STEM, and how much they've learned.	Each participating student should complete the Student post challenge survey after they complete the Plant Challenge. Students can access the survey via the Survey Monkey link in the Online Learning Hub and follow the prompts to submit their responses.	Each participating teacher should complete the Teacher post challenge survey after they complete the Plant Challenge. Teachers can access the survey via the Survey Monkey link in the Online Learning Hub and follow the prompts to submit their responses.	