

How Does a Garden Grow?

Science, Level 3

The Learning Context:

In this unit students will identify scruffy and unused areas in their school environment with the intention of transforming these outside spaces into landscaped, attractive gardens.

During the first stage of the unit students will develop an understanding of the plant kingdom, plant classification systems, and the survival needs of different types of plants.

Students will then explore their own school grounds to identify an area that needs improving. A local landscape architect could be invited to visit the class at this stage of the unit to share their expertise and offer advice to students regarding their gardening project.

Using landscape design methods, students will then create garden designs for the selected space in the school grounds. Designs can be presented to the class and the wider school community for consideration. Once a particular design is selected students will then formulate and implement a plan of action to transform the outside area.

Approximately 16-20 lessons

Achievement Objectives:

SCIENCE CURRICULUM: LEVEL 3/4:

Participating and Contributing: Students will use their growing science knowledge when considering issues of concern to them. They will explore various aspects of the issue as they make decisions about possible actions. As they:

Living World – Life Processes: Recognise that there are life processes common to all living things and that these occur in different ways.

Living World – Ecology: Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced.

Living World – Evolution: Begin to group plants, animals, and other living things into science-based classifications.

Science Learning Outcomes:

Students will be able to:

1. Name the different varieties of plants and identify their survival needs.
2. Design a garden for a selected space in the school grounds using landscape design techniques (symbols, key, scale map, etc).
3. Participate in a gardening project within the school environment taking responsibility for an allocated role.

Evaluate the success, or otherwise, of the garden project.

Enterprising Attributes:

- Generating, identifying and assessing opportunities
- Generating and using creative ideas and processes.
- Working with others and in a team.
- Identifying, recruiting, and managing resources.
- Planning and organizing.
- Collecting, organizing, and analyzing information.
- Communicating and receiving ideas and information.

Teachers to observe and collect evidence of these enterprising attributes in action.

Resource Requirements:

- Journal article: "Hukanui – Enviroschool" (Connected 4, 2002)
- Visiting landscape architect
- Gardening books and magazines
- Access to school and community based research facilities, eg: library, computers, etc
- Gardening equipment such as spades, trowels, soil, watering cans, etc
- Plants and materials (as outlined in selected plan)
- Decision Making Grid
- KWL Chart

Teaching and Learning Sequence

NB: Teachers are encouraged to gauge the prior knowledge of their students before implementing each unit so that they can provide personalised and meaningful learning opportunities. The teaching and learning sequence provided in each unit is to be viewed as a guide only. Teachers will need to adapt this sequence to meet the needs of their students, school and community.

The future focus issues of sustainability and enterprise can be explored during this unit. The quality of our environment is important to our feeling of well-being. The more we can improve and respect our environment, the more benefits we create for all living things. This is what sustainability is about. Students will need to explore innovative and enterprising ideas and apply these to their environment.

The numbered activities listed below are learning steps rather than lessons. Teachers may choose to combine two or three learning steps into one lesson. Alternatively, they may spread one learning step out over several lessons. This will be largely dependent on students' prior knowledge and their subsequent learning needs.

<p>Getting started:</p> <p>Teacher reads the journal article "Hukanui: Enviroschool" (Connected 4, 2002) to students. This article describes how students from Hukanui School have worked with the Hamilton City Council and other community groups to beautify their school. This text can be used as an inspirational tool throughout the unit.</p> <p>The unit and focus for learning is described to the students. Explain that the class will:</p> <ul style="list-style-type: none"> • explore plant life and gardening procedures. • design, plan and plant a garden area within the school environment. 	<p style="text-align: center;">LINKS TO BES Best Evidence Synthesis</p> <p>5. Quality teachers allow students to solve problems and link learning to real life experiences.</p>
<p>Researching, Planning and Designing:</p> <ol style="list-style-type: none"> 1. Complete a brainstorm to record what students already know about plants and gardening. Prompt questions could include: What different varieties of plants can you get? What do different plants need to survive? What plants like shade? What plants like sun? What steps do you need to take to plant a garden? What materials other than plants can be used when establishing a new garden? (Learning Outcome 1) 2. Use a KWL Chart - What I know; What I want to learn; What I have learned - to help students research further information about plants. Using the 'What I want to learn' column, students generate questions to ask a landscape architect. (LO 1) 3. Invite a landscape architect to visit the school to help answer some questions that the students have about gardening. The landscape architect could also share information about how they make design decisions, the skills and techniques they apply and how they draw garden plans. (Learning Outcomes 1 and 2) Collecting, organising and analysing information Ecological sustainability 4. Students may need to gather further information on gardening from different sources. Research pathways could include: making contact with Hukanui School to ask questions about their experiences, using the internet to gain information, visiting gardens and garden centres, etc. Teachers may choose to set a homework project for students where they identify the plants in their own gardens and describe the conditions that they thrive in. (LO 1) Collecting, organising and analysing information 5. Walk around the school environment and identify all the potential spaces for a garden. (Learning Outcome 3) Generating, identifying and assessing opportunities 	<p>3. Quality teachers recognise and build on students' prior knowledge.</p> <p>6. Quality teachers plan a range of activities that engage students, enabling them to complete the learning process, so what is learned is remembered.</p>

<p>6. Use a Decision Making Grid to help rank possibilities and narrow choices. (LO 3) Generating, identifying and assessing opportunities</p> <p>7. Decide which area or areas to plant. Take “before” photos of the space/s and measure the land area. If possible, invite the landscape architect back in to school to view the selected area and give planting advice. (LO 3)</p> <p>8. Visit a range of gardens in the local area. Look at the photographs of gardens in “Hukanui: Enviroschool”. What gardens do we like? What does a healthy garden look like? (LO 3)</p> <p>9. Using information gained from their research the students and teacher create a set of “success criteria” to measure their completed garden/s against. (LO 3) Excellence</p> <p>Creating:</p> <p>10. Students create garden plans using landscape design techniques and applying the knowledge that they have gathered at the research phase. (Learning Outcome 2) Generating and using creative ideas and processes Integrity</p> <p>11. Students share their garden plans with the class and the school community. (LO 2) Communicating and receiving ideas and information</p> <p>12. The class selects a garden plan to use. This could be done by a vote or survey. NB: the chosen design could be a combination of several plans if a decision is hard to reach. (Learning Outcome 3)</p> <p>13. Students and teacher list all the different jobs that will need to be allocated and the required resources for the garden project. Jobs could include purchasing resources, preparing soil bed, planting, seeking approval and funding from principal/BOT, documenting the progress of the project through video/photographs, watering the garden, making garden ornaments (mosaics, wind catchers, sculptures, bird scarers, etc). Material resources (such as soil, plants, fertilizer, etc) and human resources (such as parent helpers for concrete cutting, digging, carrying, etc) will need to be sourced and a timeline generated to outline intended progress. (LO 3) Planning and organising, Identifying, recruiting and managing resources Community and participation</p> <p>14. Jobs are allocated to students and project is put into action. (LO 3) Working with others and in teams, Identifying, recruiting and managing resources</p> <p>15. Students share their gardens with the rest of the school by hosting an official opening. (LO 3)</p> <p>16. Students make a digital slideshow (using photographs) to show their project in action. This slideshow can be shown to parents and the school. (LO 3)</p>	<p>2. Quality teachers encourage learners to work as a community.</p>
<p>Sharing and Evaluating:</p> <p>17. Students revisit KWL chart (*) and complete 3rd column (what we have learned) to document their learning. (Learning Outcome 4)</p> <p>18. Students use the “success criteria” that they drew up at step 8 to evaluate the project. Students identify the strengths of the project and areas for improvement. (LO 4)</p>	<p>10. Quality teachers engage students in goal orientated assessment.</p>

19. Students take photographs of their finished garden and compare it to the “before” shots. Photographs could be taken in following weeks and months to monitor the long term success of the project. (LO 4)

Reflective Questions:

Exploring new knowledge and skills

- What are the crucial steps you need to take to plant a garden? Can we draw these steps in a flow diagram?
- How well did we carry out our responsibilities?
- How well did we work as a team/class/community?
- What do we need to continue to do to ensure the ongoing success of our garden project?
- How do we feel about our garden?
- Would we do anything differently next time?
- Do we have any further ideas for school improvement?

Exploring what it is to be innovative and enterprising

- What step/s were you doing when you used each of the Enterprising Attributes? Break each attribute into its separate words and refine your answers.
- How could you improve on using the Enterprising Attribute/s for next time?
- Can you transfer this learning to your other topics?

Exploring further future focus issues

- Explain how your care of your local environment is an example of ecological sustainability?
- How did your interest in your local environment and your actions benefit others?
- Why do you think you are social entrepreneurs?

Possible Assessment Activities (Teacher):

Suggested assessment resources are listed below. These resources assess key knowledge about plant life and they are linked to the Living World strand.

Assessment Resource Bank Resources:

LW 2044
LW 0579
LW 0561
LW 0548
LW 0504
LW 0500

Level 3 Science Exemplars:

Trotter's Bush
We'll Give You Trees

Handy Hints:

- Children can continue to care for and grow plants in the garden beyond this unit, so that their project becomes sustainable.
- Children should have an idea of the cost of different plants before they complete the decision making grid to choose the plants.
- I added in some teaching on group work as a side focus – students need to work effectively in groups for this unit to be a success.
- This unit would be best begun in early autumn so that as soon as the weather warms up, the plants and seeds can be put into the earth. Another good time for this unit could be right at the beginning of the school year, depending on where you live.
- My class were reasonably easy to keep on task during the initial stages of planning, but some did get itchy feet and want to get out into the garden. I would suggest that you do the first lessons within a short time frame.

KWL Chart

What I know	What I want to know	What I have learnt