

I'd like to make that!

How to grow healthy plants and make your own pesticides



Resource Description

Year level: Years 4, 5 and 6

THIS IS A UNIT OF WORK FOR SCIENCE.

This is a unit with five inquiry teaching sequences about involving students in the process of understanding, documenting and improving your school's soils and growing conditions to create a productive garden that is sustainable into the future.

- It includes sections on how to test soils and how to meet the nutrient requirements of plants in order to maintain healthy growth.
- The unit encourages students to raise questions, gather and process data, make conclusions and take action.
- A feature of the unit of work is that it involves students in a variety of learning areas or subjects as they work through their sustainability investigation action process.
- By nature, the process of the sustainability action process involves students in continuous reflection of their learning. As the students move through the sustainability action process, they revisit questions asked, statements made, opinions asserted. Students will find that their ideas may shift as they work through activities and that the ideas they began with may be challenged or refined.

ACKNOWLEDGEMENTS

This Junior Landcare educational resource has been developed by teachers with support from Landcare Australia and the Primary Industries Education Foundation (PIEF). The resource is designed to introduce young people to the ways Saints Peter and Paul Primary School has utilised the school grounds to cultivate and to protect the plants in the vegetable gardens and surrounding grounds.

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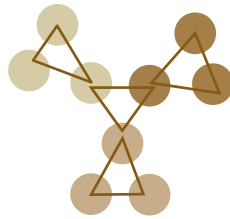
The materials in this educational resource have been provided by Aaron Fox from Saints Peter and Paul Primary School, Garran in the Australian Capital Territory. Sts Peter and Paul was a finalist in the 2012 National Landcare Awards, Westpac Education category. The school constructed an Environmental Education Centre, making use of new technologies and including a student kitchen - enabling students to discover the benefits of organic, fresh, healthy, sustainable and home-grown food.

Step One

Engage with the topic

Objective: Identify and explore the issues in and around the school grounds affecting plant growth.

At Saints Peters and Paul Primary School, students are set the task of identifying which plants they want to grow for each upcoming season in their kitchen garden.



1. To engage the students and ascertain their knowledge base, the class begins by investigating what they already know about plant parts, plant growth, life cycle and growing conditions.

The class also classifies the plants into five groups (Solanums, Legumes, Brassicas and Leafy Greens, Alliums and Root Vegetables, and Cucurbits and Sweet Corn) to ensure that there is a variety of plants growing. This also helps with the school's crop rotation system.
2. Have the students break into groups and ask them to complete a brainstorm or a TWLH chart about the different areas surrounding plant development (e.g. plant growth, plant parts, plant life cycles, plant species, etc.):

Give each group 5-10 minutes to complete their brainstorm and then move to a different topic. Rotate the groups until every group has covered each topic and then collate the class results.
3. Create a word wall or word cloud (see websites section at the end of this document) from the data collated, then display this somewhere in the classroom where words can be added to throughout the unit of work.

Step Two

Explore the topic

Objective: Frame questions and actions and to collect information



Students are encouraged to refine their questions and to clarify how their investigations will be conducted.

1. FORMULATING AN ACTION PLAN

Individually or in groups, ask the students to formulate possible lines of inquiry for selecting appropriate plants for their kitchen garden based on the season they are planting for, the plant family they have, plant nutrient requirements, etc. As a class, brainstorm areas for possible consideration and then invite the children to formulate an action plan.

Some areas that the student action plans should include:

- Problem areas identified.
- Strategies and timeframes.
- Nominate who is responsible.
- Resources needed.
- Indicators of success.

Consider a plan with the following headings. Display these details as an ongoing reference for students to use and brainstorm to decide where relevant information might be found.

How?	What?	When?
Who and what is needed?	How will we know if it worked?	

In developing the action plan, the class should also consider:

- What might limit their actions? (e.g. adoption of Organic Gardening Strategies)?
- Who might be available to help them?
- What finances or resources are available for the improvement or action?

2. RESEARCH & INVESTIGATION

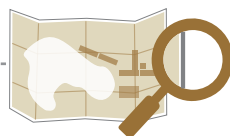
Discuss how valuable information may be gathered and encourage students to:

- Search the 'world wide web' for relevant sites and explore links to other sites;
- Conduct interviews with staff from the local Council and government agencies
- Identify people who are knowledgeable about increasing the diversity of plants, animals and other organisms in areas;
- Document known information;
- Develop contacts in the broader community for relevant information;

- Write or email letters to groups involved with the design of innovative technologies. They may be industry groups, government agencies, research institutions and/or organisations.

Some sources of information

- Watch the YouTube clip Seed parts, Seed germination process, Seed dispersal methods for Kids (<http://youtu.be/oYzXToyEzBU>) and relate this information back to the previous lesson. Add to the word wall, if needed.
- ABC Vegie Guide iPhone App
- Stephanie Alexander
- The Little Vegie Patch (book)
- The Diggers Club



Step Three

Explain how they are going to prepare the garden bed and ensure the success of their planting

Objective: Have the students prepare for and plant their seeds of choice.

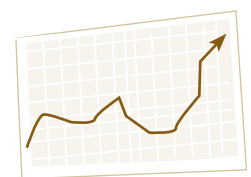
Quick and easy How to Guides including "Creating a food garden," are available for download via Landcare Australia's dedicated webpage juniorlandcare.com.au/curriculumresources



IN GROUPS, ENCOURAGE...

1. Tabulate the findings from their investigations.
2. Check one person's interpretation against another's within their group and compare their results to other groups.
3. Identify any inconsistencies.
4. Evaluate information that presents contrasting opinions.
5. Look for opportunities where recycled materials may be used. E.g. egg containers for seedling trays, strawberry containers for mini-hothouses etc.
6. Examine the appropriateness of processes used.
7. Identify the key functional, aesthetic and environmental features of the ideas and practices used to increase the diversity of plants, animals and organisms
8. Select ideas for action.
9. Plan to communicate the proposal to the class.

AS A CLASS:



- Break into small plant family groups.
- Determine objectives and desired outcomes: What do you want to achieve? How will you know if it is being achieved?
- Design your approach. Each group needs to present an action plan for planting and contingency plans for meeting the needs of the plants as they grow.
- Construct an intended timeline of growth and jobs that need to be attended to during these highlighted times. Specify who, what, when, where and how this will be achieved.

Step Four

Elaborate on concepts and ideas

Objective: Have the students set their plans into action and look to adapt to their results.



Students activate their action plans. They need to prepare their seed raising soil and their garden bed for their seedlings. At each step, they need to document their actions and relate back to their proposed timelines and action plan. Continuously during this process, the students need to be evaluating their timeline and bear in mind contingency plans as they form necessary adaptations.

Two natural pesticides have been effective at Saints Peter and Paul.

Download the **How to Guide** developed with them; "*Growing healthy plants using natural pesticides*" at juniorlandcare.com.au/curriculumresources

When the students come up against an obstacle they must ensure their solution is as organic and as sustainable as possible. Examples of this might be where students observe that their plant/s may need some extra fertilising or need some form of pest control.



Step Five

Evaluate

Objective: Look back and evaluate the process that the students took to grow their plants and the effectiveness of their plan.

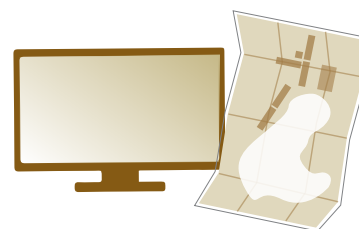
These resources will allow all students, including future students, to have reference to and build their own knowledge of how to grow a diverse range of plants in the school's vegie garden.

See juniorlandcare.com.au/curriculumresources for examples.



Students will evaluate their action plan and the sequencing of their timeline. In small groups, ask the children to create a How to Guide for successfully growing the plant of their choice.

In class, this How to Guide will be presented either as a poster, pamphlet or short video that can be up loaded to the school YouTube channel.



This Junior Landcare resource is proudly supported by Landcare Australia, PIEF, and through funding from the Australian Government's National Landcare Programme



Primary Industries
Education Foundation



Australian Curriculum Content Descriptions

CROSS CURRICULUM PRIORITIES: SUSTAINABILITY

SYSTEMS

OI.1: The biosphere is a dynamic system providing conditions that sustain life on Earth

OI.3: Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.

FUTURES

OI.7: Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), downloaded from the Australian Curriculum website 15 September 2014.

WEBSITES

Landcare Australia's guide *Creating a Food Garden*
juniorlandcare.com.au/wp-content/uploads/2014/10/Creating-a-food-garden-12.9-LR.pdf

Junior Landcare juniorlandcare.com.au

Australian Curriculum, Assessment and Reporting Authority (ACARA)
<http://www.australiancurriculum.edu.au/>

ABC Veggie Guide App
abc.net.au/gardening/resources/vegie_app.htm

Gardening Australia
abc.net.au/gardening/

Make Me a Genius Science Video
makemegenius.com/

Word Cloud
<http://worditout.com/word-cloud/make-a-new-one>

You Tube
youtube.com

The Diggers Club: diggers.com.au
(information about vegetable growing and organic gardening)

Landcare Australia's Junior Landcare Curriculum Resources:
juniorlandcare.com.au/curriculumresources

SCIENCE:

STRAND: Science Understanding: Biological sciences

ENTRY: Living things have life cycles **ACSSU072**

ENTRY: Living things, including plants and animals, depend on each other and the environment to survive **ACSSU073**

ENTRY: Living things have structural features and adaptations that help them to survive in their environment **ACSSU043**

ENTRY: The growth and survival of living things are affected by the physical conditions of their environment **ACSSU094**

STRAND: Science as a Human Endeavour: Nature and development of science

ENTRY: Science involves making predictions and describing patterns and relationships **ACSHE061**

ENTRY: Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena **ACSHE081**

STRAND: Science Inquiry Skills: Planning and conducting

ENTRY: With guidance, plan appropriate investigation methods to answer questions or solve problems **ACSIS086**

STRAND: Science Inquiry Skills: Questioning and predicting

ENTRY: With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be **ACSIS232**

REFERENCES

Alexander, S. (2013) *Kitchen Garden Companion*, Penguin Lantern, Australia.

Australian Academy of Science (2005) *Primary Connections*. Canberra, ACT.

Capomolla, F. & Pember, M. (2011) *How to grow food in small places*. The Little Veggie Patch Co., Australia.

AVAILABLE APPS

RWT Timeline App.
International Reading
Association

ABC Veggie Guide
iPhone App

Word Clouds by
ABCYa.com