



EFSCAN

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Central Australian Network



**Arid
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Environment Protection Authority



**ALICE SPRINGS
COMMUNITY GARDEN
NETWORK**



Alice Springs Community Garden Excursion Guide

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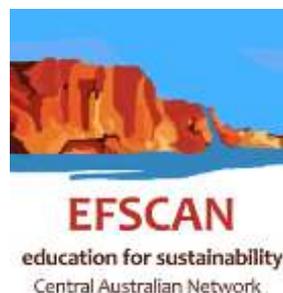
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Introduction

Alice Springs Community Garden Excursion Guide provides teachers and students with an opportunity to learn about sustainable use of waste, water and food in the context of the Alice Springs Community Garden. With people increasingly removed from the source of food production, this guide gives students the chance to get their hands dirty as they explore examples of sustainable food production, sustainable use of water and waste in the community garden context. For instance, in the *Sustainable Use of Water* module, students learn about Alice Springs' water and ways to use water sustainably in the garden. They then use this information to investigate the water saving features of the Alice Springs Community Garden. Later, back at school, they use their newfound understanding of water efficiency measures to design their own water efficient garden. We hope this resource open your student's minds to the wonders of growing your own food, as well as some the challenges of everyday sustainably living, from the food they eat to the use of water and waste in their own homes.



We understand that school curriculums are already overcrowded. These Alice Springs Community Garden lessons are designed to be taught within the existing curriculum and linked to the National Curriculum Framework.

How this excursion guide works

The excursion guide has been developed to use the Alice Springs Community Garden to explore three main theme areas. There is one teaching module per theme area. These modules are:

- 1) **Sustainable food production – Food miles**
- 2) **Sustainable use of water – Water efficient gardens**
- 3) **Sustainable use of waste – Composting**

Each of these modules will have three lessons; one lesson before the excursion (pre-visit), one during (on-site) and one after (back-at-school). These lessons are termed pre-visit, on-site and back-at-school activities throughout this guide. In addition, there is a two lesson introduction to the community garden module which includes one pre-visit and another on-site lesson.

An overview of modules

1) An introduction the community garden

There are two lessons that run across all three modules which aim to familiarise students with the concept of community gardens and with the Alice Springs Community Garden itself.

2) Sustainable food production – Eating local and food miles

This module will introduce the concept of food miles and highlight the connection between the food we eat, carbon production and global warming by looking at where our food comes from in Alice Springs and comparing it to the getting food from the Alice Springs Community Garden. Before the excursion, students will gain an insight into how far our food travels to Alice Springs by calculating how far a range of food travels to Alice Springs. During the excursion, the student will note all the types of fruit and vegetables available at the community garden that are largely food mile free. After the excursion, students will reflect on their learnings from the excursion and have an opportunity to creatively communicate their understanding of food miles and possible ways to reduce them.

3) Sustainable use of water – Water efficient gardens

Did you know that around 65% of Alice Springs' residential water use goes straight onto the garden? This module will use the Alice Springs Community Garden and as a case study to demonstrate how gardens can use water efficiently to produce food in Alice Springs. Students will watch some short YouTube clips on water efficiency in Alice Springs' gardens and research Alice Springs' water supply online. They will then put these ideas to the test at the garden itself, auditing the garden's water efficiency. After their excursion, students will design their own water efficient garden based on what they have learnt. Students will gain an understanding of water efficiency measures and develop their own garden plan incorporating water efficiency measures.

4) Sustainable use of waste – Composting

Most of Alice Springs' food waste goes straight to the tip, where it produces methane that adds to global warming. This module will involve students engaging and answering questions about a series of composting YouTube clips. The students will use their time at the Alice Springs Community Garden to investigate how composting works firsthand. Back at school, the students will develop a poster or presentation on composting at Alice Springs Community Garden using photos from the excursion to promote composting.

An overview of lessons in this guide			
Module	Lesson	Students will complete	Resources
Introduction to Community Gardens	Pre-visit: What is a community garden?	Annotated map of schools garden or research into other community gardens	Kim Hopper Vimeo clip Resource 1:
	On-site: Alice Springs Community Garden Treasure hunt	Alice Springs Community Garden Treasure hunt	Resource 2
	Back-at-school:	NA	NA
Sustainable food production – Eating local and food miles	Pre-visit: Where does our food come from?	Calculations of food miles and carbon emissions	Resource 3
	On-site: An audit of food available at the Alice Springs Community Garden	List of food available at the community garden	Resource 4
	Back-at-school: Reducing your family's food miles	A list of jointly developed solutions to reduce food miles A comic strip explaining 5 ways to reduce your family's food miles	Resource 5 A3 paper
Sustainable use of water – Water efficient gardens	Pre-visit: Water efficient gardens in Alice Springs	Questions on water efficiency from Power and Water website and Alice Water Smart YouTube clip	Power and Water Website AWS Water Efficient Gardening (YouTube clip) Resource 6
	On-site: An audit of the water use at the Alice Springs Community Garden	A completed audit of the Alice Springs Community Garden showing water efficient features, a labelled map and completed questions on the activity.	Resource 7
	Back-at-school: Designing a water efficient garden for Alice.	A design of their own water efficient garden incorporating water efficient features	Resource 8
Sustainable use of waste – Composting	Pre-visit: Intro to composting with Costa	Questions on composting video. Positive and negatives of composting group activity	Costa's Guide to Household Composting (YouTube clip) Resource 9
	On-site: Investigation into composting at the Alice Springs Community Garden	Observation sheet on the various compost piles A graph of the temperature various stages of composting	Resource 10
	Back-at-school: Poster on composting at Alice Springs Community Garden	A poster/PowerPoint on composting at Alice Springs Community Garden – using photos from the garden to promote composting	NA

Links to Australian Curriculum¹

Module	Lesson	Students will complete	Australian Curriculum
Introduction to Community Gardens	Pre-visit: What is a community garden?	Annotated map of schools garden or research into other community gardens	Geography Year 5: Geographic Knowledge and Understanding : People and environments: ACHGK029 Geographic Inquiry and Skills: ACHGS036,038 Year 6: Geographic Inquiry and Skills : ACHGS043, 045 Year 7: Geographic Knowledge and Understanding: ACHGKK046 Geographic Inquiry and Skills : ACGHS050, 053 Year 8: Geographic Inquiry and Skills : ACGHS058, 061
	On-site: Alice Springs Community Garden Treasure hunt	Alice Springs Community Garden Treasure hunt	
Sustainable food production – Eating local and food miles	Pre-visit: Where does our food come from?	Calculations of food miles and carbon emissions	Geography Year 5: Geographic Knowledge and Understanding: Characteristics of places: ACHGK026, 29 Geographic Inquiry and Skills : ACHGS035, 038 Year 6: Geographic Inquiry and Skills : ACHGS043, 045 Year 7: Geographic Knowledge and Understanding: Place and liveability: ACHGKK046, Geographic Inquiry and Skills : ACGHS050, 053 Year 8: Geographic Inquiry and Skills : ACGHS058, 061
	On-site: Food plants of the Alice Springs Community Garden	List of food available	
	Back-at-school: Reducing your family's food miles	A comic strip explaining 5 ways to reduce your family's food miles	
Sustainable use of water – Water efficient gardens	Pre-visit: Water efficient gardens in Alice Springs	Questions on water efficiency from power and water website and Alice Water Smart YouTube clip	Geography Year 5: Geographic Inquiry and Skills : ACHGS043, 036, 038 Year 6: Geographic Inquiry and Skills : ACHGS043, 045 Year 7: Geographic Knowledge and Understanding: Water in the world: ACHGKK037, 38, 39 040,041 Geographic Inquiry and Skills : ACGHS050, 053 Year 8: Geographic Inquiry and Skills : ACGHS058,059, 060, 061,062 Science Year 7: Science Understanding : Earth and space sciences: ACSSU222
	On-site: An audit of the water use at the Alice Springs Community Garden	An completed audit of the Alice Springs Community garden showing water efficient features	
	Back-at-school: Designing a water efficient garden for Alice.	A design of their own water efficient garden incorporating water efficient features	
Sustainable use of waste – Composting	Pre-visit: Intro to composting with Costa	Questions on composting video. Positive and negatives of composting group activity	Science Year 5: Science as Human Endeavour: ACSHE081, 083,217 Science Enquiry Skills: ACSIS086, 088, 090,093 Year 6: Science Understanding : Biological sciences: ASSSU094, Chemical Sciences: ACSSU095 Science as Human Endeavour: ACSHE098, 100, 220 Science Enquiry Skills: ACSIS105, 107, 110 Year 7: Science as Human Endeavour: ACSHE120, 121, 220 Science Enquiry skills: ACSIS125,126, 129, 130,133 Year 8: Science Understanding : Chemical Sciences: ACSSU225 Science as Human Endeavour: ACSHE135, 136 Science Enquiry Skills: ACSIS144, 145, 148
	On-site: Investigation into composting at the Alice Springs Community Garden	Observation sheet on the various compost piles including completed graph and questions.	
	Back-at-school: Poster on composting at Alice Springs Community Garden	A poster/ presentation on composting at Alice Springs Community Garden – using photos from the ASCG to promote composting	

¹ Note: All of these lessons focus on sustainability and as such are opportunity to address the sustainability cross-curriculum priority of the Australian Curriculum.

Recommended Excursion Sequence

We recommend you:

- 1) Undertake an Introduction to the community garden lesson (What is a community garden?). This will include visiting your school's own garden (if you have one) and creating a map of what is there or alternately researching another community garden in Australia.
- 2) After choosing a module or modules undertake the relevant pre-visit activities
- 3) Visit the Alice Springs Community Garden and complete the relevant on-site activities
- 4) Follow up with the back-at-school activities from the relevant module

Who Can Help?

For assistance please contact:

The Convenor, The Arid Lands Environment Centre: 08 89523572 or info@alec.org.au

Before you go

Approvals

As for all excursions, teachers need to ensure that all departmental policies and procedures regarding excursions are adhered to including teacher to student ratios, parental notification and completing the required risk management checklist when the excursion is planned.

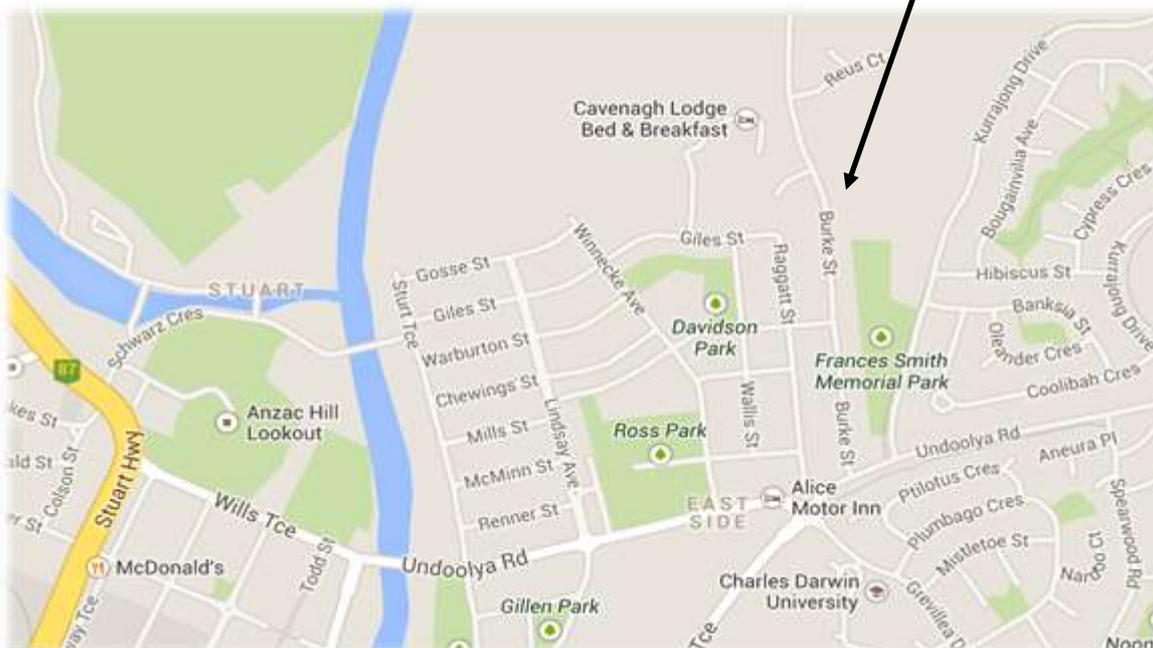
As the site has some risk of bees, ensure that you are prepared for the possibility of bee sting and have information regarding allergies (particularly bee allergy).

Getting there

Access: The Alice Springs Community Garden is secured by a combination lock on the front gate. To gain access to the Alice Springs Community Garden teachers will need to contact the Arid Lands Environment Centre on 8952 2497 for details as to security protocols.

Getting there: Alice Springs Community Garden is located at the Frances Smith Memorial Park, which lies between Burke Street and Kurrajong Drive in East Side, Alice Springs. Access to the community garden is from Burke Street. Travelling north on Burke Street turn right about 100 metres after McKay Street. You will see the cyclone fencing of the Alice Springs Community Garden through to your left. Vehicles can park next to the cyclone fencing.

The Alice Springs Community Garden is here!



Site Description – Alice Springs Community Garden

The Alice Springs Community Garden site includes several undercover meeting areas, a circular mandala garden, the garden individual plot areas, demonstration plots, swales planted with fruit trees and natives, and a composting area. All of these areas are clearly marked on the map of the Alice Springs Community Garden below. This map can be also found at the entrance to the garden.

Map of Alice Springs Community Garden



Safety on site

Class management

Discuss safety issues and protocols with children before the excursion.

Have a plan what to do with any behavioural issues previous to the excursion.

Plan for children to work in small groups and set up stations for rotating activities, this will work better than whole class activities.

As per school policy, ensure you take a first aid kit with you to the garden.

Working with the seasons

This is an outdoor site, so all children will need to have access to drinking water, sturdy footwear and adequate sun protection.

Given this, visiting the garden during the heat of the day is not recommended from September to early May.

Watch out for

At times, the combination of water and flowering plants can attract bees. Assess the risk of bees on arrival at the garden and keep children away from any bee prone areas.

Remind children to not lift any items that are potential snake habitat.

Looking after the garden

The Alice Springs Community Garden hosts privately leased plots. Please ensure that the children keep on the paths in the plot area and do not enter or interfere with the privately leased plots (i.e. trample on the food plants or harvest the food) in any way. Given this, it is recommended that all students are closely supervised.

Amenities

No amenities are available at the Alice Springs Community Garden. However, there are toilets and drinking water in the adjacent Francis Smith Memorial Park approximately 50 metres from the garden to the south.

The playground

Francis Smith Memorial Park is a popular local playground. Consider allowing time for younger students to take advantage of the facilities after your excursion to the community garden.

Safety with tools

If using any tools such as shovels and rakes remind children of the safe handling of the tools.

Teacher Resources

This range of resources will help teachers and student prepare for and use the community garden to its potential. To indicate that a resources is used for a particular lesson, the name of the lesson given in brackets next to the resource.

Videos/ YouTube clips:

Kim Hopper: Community Gardener (2:15) (What is a community garden? Kim Hopper on the social aspect of the Alice Springs Community Garden. See how the community works together to develop the garden.

<http://vimeo.com/54409138>



Costa's Guide to Household Composting (3:31) (Introduction to Composting)

An informative overview on why compost and how to do it featuring Costa:

<http://www.youtube.com/watch?v=HngvowScx6g>

Field to Fork: Episode 2 "Food miles" (1.21) A short animated humorous introduction to food miles

<http://www.youtube.com/watch?v=b7rn5hH5XN8> (Where does our food come from?)

ABC Gardening, 2013, *Clever Composting*: <http://www.abc.net.au/gardening/stories/s2280642.htm>

Alice Water Smart YouTube Clips

A range of short Alice Water Smart videos YouTube clips can be accessed at:

<http://www.youtube.com/user/AliceWaterSmart>

Alice Water Smart Leak Check: How to check for water leaks (.58)

<http://vimeo.com/63877260>

AWS Water Efficient Gardening (3:16) (Saving water in Alice Springs Gardens)

Alice Water Smart produced educational video featuring Alex McClean on water efficient gardening design in Alice Springs. Showcases the 5 principles of watersmart garden design (plan your garden, group your plants, correct irrigation equipment, catch rainwater and use mulch).

<http://www.youtube.com/watch?v=cZFcVeMSakQ>



AWS Water Smart Garden Irrigation (3:28) (Saving water in Alice Springs Gardens)

Alice Water Smart produced educational video featuring Louise Stokes on water efficient garden irrigation in Alice Springs. Exactly how much water do the different parts of your garden need?

<http://www.youtube.com/watch?v=FgpYamPIzyY>

The Food Miles Challenge (4.41) <http://www.youtube.com/watch?v=uTU7-x2OTa8>

Online background materials

Alice Springs Community Garden Website: <http://alicecommunitygarden.org.au/> (What is a community garden?)

Alice WaterSmart website: <http://alicewatersmart.com.au/>

Alice WaterSmart Online Garden Watering Planner (2013):
<http://alicewatersmart.com.au/node/195>

Alice Water Smart: 10 Oct 2013 Press Release, *Alice Springs garden watering planner a first for arid Australia*, <http://alicewatersmart.com.au/node/215>

Fact Sheet: Water smart garden design in Alice Springs:
<http://www.alicewatersmart.com.au/sites/default/files/PDF's/Water%20smart%20garden%20design%20in%20Alice%20Springs%20-%20Fact%20Sheet.pdf> (Planning your own water efficient garden)

Power and Water website, *An online home water audit*,
<http://www.savewater.com.au/powerwater#5>

Power and Water website, *Water in the Alice Springs and Central Australia*,
<http://www.savewater.com.au/powerwater/alice-springs-and-central-australia> (Saving water in Alice Springs Gardens)

International Food Miles Calculator: <http://www.foodmiles.com/results.cfm> (Where does our food come from?)

Books:

Alice Springs Vegie Garden Companion: A handbook for growing food in Alice Springs (2009) @ http://alicecommunitygarden.org.au/writeable/custom_uploads/Vegie_companion_small2.

An introduction to community gardens

Lesson Plans

Pre-visit: What is a community garden?

Subject area: Geography

Suggested timing: 20-50 minutes

Summary: This lesson gives the students an overview of community gardens. It is a great first step before undertaking any of other modules in this guide. It can be condensed into a short 20 minute introduction or extended out to several 50 minute lessons by either visiting your own community garden (if you have one) and/or exploring other community gardens in Australia online.

Students will learn: What a community garden is and some examples of community gardens in Australia.

Background notes

Community Gardens http://en.wikipedia.org/wiki/Community_gardening

Alice Springs Community Garden <http://alicecommunitygarden.org.au/>

- A community garden is a piece of land gardened by a large group of people to grow their own fresh fruit and vegetables.
- They can be in schools or in the community.
- Usually community gardens include plots, which are patches of land that individuals rent annually to grow fruit and vegetables, and communal garden areas.
- Some advantages of community gardens is that they give people an opportunity to grow their own fresh produce, gain a sense of community and reduce the distance that food needs to travel to consumers.

Materials

- Copies of **Resource 1**

The Activity

Briefly introduce the concept of community gardens using information from the background notes.

- 1) Hand out **Resource 1, Section A**. Watch the following video as an introduction to the Alice Springs Community Garden. *Kim Hopper: Community Gardener* (2:15)
<http://vimeo.com/54409138>
- 2) Try playing the 2 minute clip twice, to give students an opportunity to complete the questions in **Resource 1, Section A**. A suggestion is to first watch the video with the sound turn off so students can focus what people do in the community garden. Then play the video with the sound up so they can answer Questions 3 and 4.
- 3) After the students have completed **Resource 1, Section A** discuss their answers.

Discussion questions

- What is a community garden?
- Has anyone visited a community garden before? What was it like?
- How does it differ from a home garden?
- What do you think are some of the advantages of using a community garden to grow food?
- What do you think are some of the disadvantages?

- How do you think the Alice Springs Community Garden may have changed from what we see in the video when we visit it?

Option 1: If your school has a community garden, you can take the students to visit your school's community garden and draw up a plan showing garden beds, how the plants get water (irrigation), the compost area and what food plants are in the garden. To do this use **Resource 1 Section B: Looking at our own community garden.**

Option 2: If your school doesn't have a community garden, students can research one of the many community gardens within Australia using the internet and prepare a brief overview of how the community garden works using **Resource 1, Section C: Research a community garden.** After completing this activity, students groups can report back to the group a summary of the community garden they have researched. They can just simply research the Alice Springs Community Garden, by looking up its website.

Summation: Reflect on what you have learnt about community gardens. Remind the students of the upcoming excursion to the Alice Springs Community Garden and ask the students to suggest ways that the Alice Springs Community Garden may differ from either their school's community garden or the researched community garden. Record these answers and refer back to them after the visit.

On-site: The Alice Springs Community Garden Treasure Hunt

Subject area: Geography

Suggested timing: 20-30 minutes

Summary: This activity gives students a fun way to explore the community garden and record its features. It can be conducted as a race.

Outcomes: students will be able to:

- Identify different features of the Alice Springs Community Garden
- Identify a range of food growing in the Alice Springs Community Garden.

Background notes for teachers: NA

Materials

- A box of 10 or more stopwatches
- 25 copies of **Resource 2: Community Garden Treasure Hunt** worksheet
- Prizes for winning group (optional)

The activity

1. Introduce the activity as a treasure hunt to find and record as many features of the community garden in a short period of time.
2. Put students into groups of 2 or 3.
3. Hand out **Resource 2: Community Garden Treasure Hunt** and one stopwatch per group and tell the students they have 15 minutes to find all the items on the worksheet and complete the worksheet. Remind them that they will be disqualified if they enter a plot, stray from the main paths or fail to return to the allocated area in 15 minutes. Suggestion: if you want to make the activity a race tell them prizes will go to the group that does the activity best (i.e. gets the most thorough list of vegetables).
4. When the students are ready let them know they can start their stopwatches and go.
5. After the allotted time is finished, regroup the students.
6. Go around the groups getting possible answers from the students. If there is time determine winners and allocate prizes.

Discussion questions

- What interesting/ unexpected things did you find?
- What foods did you find in the garden?

Summation: Reflect on what unexpected things they found in the community gardens. Link what they found in the community garden to the next module you plan to undertake

Sustainable food production – Food miles



Food miles matter

Food miles refer to the distance that food travels before it is consumed. Living in Alice Springs, most of the food we eat has travelled a long way from where it is produced to the supermarket shelves here. The transport of that food from where it is grown, to where it is eaten, creates carbon emissions which contribute to global warming. The amount of emissions created transporting food depends on both the distance travelled and the type of transport used, with planes having the highest emissions per kilometre travelled and train having the lowest emissions per kilometres travelled. Buying food that is produced locally reduces the emissions related to the transport of your food, meaning that locally produced food is better for the planet. One way to save on food miles is by growing your own fruit and vegetables. Visiting the Alice Springs Community Garden shows students that this is possible to grow a great variety of food in central Australia and save on food miles, as we use this food instead of imported food from the supermarket.

Most students will have little awareness that everyday choices, such as what we buy to eat, impacts on the environment. This module will introduce students to the concept of food miles and how simply trying to buy as local as possible, or growing your own food, can reduce carbon emissions.

Pre-visit: Where does our food come from?

Subject area: Geography

Suggested timing: 50 minutes

Summary: Often food has travelled a long way before it hits our supermarket shelves here in Alice Springs. In this activity we record how far a selection of food has travelled (or its food miles) using a map of the world and then calculate how much carbon has been emitted getting that food to Alice Springs. For the less maths focussed, there is also the option of calculating carbon emissions and food miles using an online emissions calculator.

Student outcomes: Students will learn:

- The definition of food miles and the link between food miles and carbon emissions;
- Where in Australia and the world selected items of food are produced;
- How to calculate food miles and estimate carbon emission made;

Background notes for teachers:

<http://www.foodmiles.com/results.cfm>

Materials

- Five items of pre-packaged food: tuna (from Thailand), olive oil (from Spain), tinned tomatoes (from Italy), coconut milk (from Malaysia) and rice crackers (from Thailand).
- Five item of fresh food: grapes, oranges, potatoes, tomatoes and a zucchini.
- **Copies of Resource 3**
- A large map of the world or a projection of a map of the world.
- Food labels for each food item (see **Teacher Resource 1**).

Preparation

This activity needs significant preparation. Previous to the lesson:

- Purchase food items listed in the materials for display in the classroom.
- Set up the map of the world on the board
- Draw up the table of distances travelled (see Table 1)
- Cut up and distribute the food labels from **Teacher Resource 2**.

The activity

1. Introduce the activity by asking the students where they think their food comes from. Tell them that today they going to learn how far their food travels by looking at the food that has been brought in and finding out where it comes from. They will look at how far food is travelling to get to Alice Springs and then work out how much carbon is being made in transporting that food to Alice Springs.
2. Introduce the concept of food miles and how carbon emissions created in transported food contributes to global warming. Showing the 1 minute YouTube video *Field to Fork: Episode 2 "Food miles"* may help: <http://www.youtube.com/watch?v=b7rn5hH5XN8>
3. Ask for a volunteer scribe to help fill in the food miles table on the board as you do the activity and a volunteer mathematician with a calculator to do the calculations of food miles and carbon emissions.
4. Hand out the food labels to 10 students and tell them you will get them to come and put up the food label in the right spot of the map as you go through the food items. For an easier option (using an online carbon emission calculator) go to 5. If you want to work out carbon emissions yourselves go to 6.
5. **The easier option:** If the table below looks too complicated you can skip steps 6 to 10 and simply do the activity with the online food miles and carbon emission calculator at: <http://www.foodmiles.com/>. Then skip to step 10.

6. **The harder option:** Pick up one item of food at a time, talk through the food and where it comes from. As you do so get the person with the food label to come up and stick it where the food comes from onto the map of the world. Whilst they do this, ensure the scribe fills in the distances on the table on the board. Leave the carbon emissions column blank for now. Your table should look like the one below.

Working out food miles and carbon emissions

Food	Where is it from?	Distance to Melbourne (km)	Grams of CO ² Produced for 1 kg (km)	Distance from Melbourne to Alice Springs (km)	Grams of CO ² Produced for 1 kg (km)	Total CO ² produced for 1 kg
1) Tuna	Thailand	8000	=8000 ×.13=1040	2225	=2225 ×.27=601	1040+601= 1641
2)						
3)						
4)						
5)						
6)						
7)						
8)						
9)						
10)						
Total						

7. Once all the food labels are up on the map, ask the students to copy the results into their own tables in **Resource 3**.
8. Ask the students the following focus questions:
- What food has the most food miles?
 - What food has the least food miles?
9. Now introduce the concept of calculating carbon emissions saying that if you know how far an item has travelled and how it travelled, you can estimated the carbon emitted moving it around the globe. How much carbon is emitted for each kilometre travelled depends on how the food travels, with food coming by train emitting the least and food coming by plane emitting the most. Note: Whilst Alice Springs food comes by train and truck and food and from overseas by boat and plane, for the purpose of the exercise we will assume that all food within Australia comes to Alice Springs on a truck and all food from overseas comes to Australia a boat. Explain the carbon emission calculation so they can calculate carbon emissions.
- Grams of CO² = distance travelled (km) x Grams of CO² emissions per km travelled for each kg of food (depending on transport type)

Grams of GHG emissions per km travelled for each kg of food using different types of transport (Environment Canada 2002)

Transport method	Grams of CO ² emissions per km travelled for each kg of food
Truck	.27
Train	.02
Boat	.13
Plane	1.1

Get the volunteer mathematician to work out the carbon emissions for each piece of food and add these to the row on the right on the board.

10. Now add all the kilometres and emissions together to calculate:

- The total distance travelled by the 10 items of food
- The total estimated emissions for the 10 items of food

11. Discuss your findings.

- Which food created the greatest carbon emissions being transported to Alice Springs?
- Which food created the least amount of carbon emissions being transported to Alice Springs? What about this picture is surprising?
- If we grow this food locally, why do you think that supermarkets are stocking all this food from so far away?

11. Ask the students to write up a brief overview of what they have learnt from the lesson in their books.

Summation: This activity shows you how far our food has travelled before we eat it and gives us an idea of the amount of carbon emissions created as food is transported from where it was made to where it is consumed. When we go to the Alice Springs Community Garden we will see another way of getting food without food miles.



On-site: Food plants of the garden

Subject area: Geography

Suggested timing: 50 minutes

Summary: One way of minimising food miles is by growing your own food. In this activity, students will explore the diversity of food grown in the community garden.

Student outcomes: Students will learn:

- to identify different food plants as they grow;
- how growing food locally is one way to reduce food miles.

Background notes for teachers: There are lots of different food types in the garden: leafy vegetables (lettuces, Asian greens, spinach, and rocket), fruit (citrus, mulberry and melons), vegetables (zucchinis, squash, pumpkin, sweet potato, tomatoes and celery) and herbs (parsley, basil and mint). However, these may not all be visibly productive at the time of visit. An understanding of what food different plants look like when they are not producing is helpful, so bringing a knowledgeable teacher/ helper or a book on vegetables with you will be useful.

Alice Springs Vegie Garden Companion: A handbook for growing food in Alice Springs (2009) @ http://alicecommunitygarden.org.au/writeable/custom_uploads/Vegie_companion_small2.pdf

Materials

- Copies of **Resource 4**
- Clipboards
- Book on growing vegetables (if possible)

The activity

1. Discuss some of the kinds of foods you might expect to find in the community garden, how they look and how they grow. Tell the students that the aim of today is to really look closely at the plants that grow in the community garden, to try and figure out what food grows here. Remind them that some plants might not actually look like a fruit or vegetable plant, as they aren't growing food at the moment or the food is growing underground (like potatoes). Given this, they will need to look closely and share their knowledge so everyone can get a good idea of what is here.
2. Hand out **Resource 4** and take them through the requirements of the task.
3. Put the students into small groups and remind them they will have around 30 minutes to complete the table.
4. Give the students time to walk the garden and identify food plants. Encourage students to help one another. Note: the students may need guidance in identifying what plant makes what fruit or vegetables. Give them tips on how to guess (such as using their sense of smell or looking really closely) and have a teacher on hand to assist or some reference materials.
5. After 30 minutes regather the students to discuss what they have found.

Discussion questions

- What fruit or vegetable plants did you find?
- Which were the most common?
- What parts of the plants you found were edible?
- Were there any plants that make food but they weren't ready to eat? If so which ones?
- Of the plants you found – how many of them have you eaten? Were there any you have never eaten?
- Did you learn anything new? What surprised you?
- What is the advantage of eating food from the community garden in terms of food miles?

Summation: Link what the students have seen today to food miles. Remind students to hang onto their list of food as they will be making a class list of all the food available in the community garden.

Back-at-school: Reducing your food miles

Subject area: Geography

Suggested timing: Two 50 minute lessons.

Summary: After a structured discussion students have the opportunity to find a creative way to communicate their understanding of food miles and ways to them.

Student outcomes

Students will learn to:

- relate food miles and related concepts to their local environment and their own home;
- develop creative solutions to reduce food miles in their local community;
- and creatively communicate solutions food miles story (extension).

Materials

- Completed copies of **Resource 4** from the excursion
- Copies of **Resource 5** (if doing Option 1 extension activity)
- Computers with internet access

The activity: Lesson 1

1. Ask the students to share their field notes of the food available at the community garden. Write up a list of all the food available in the Alice Springs Community Garden with the class on the boards.
2. Ask the students which of these foods they have ever had at home and mark those foods.
3. Remind the students of food mile theory and how they learnt that food in Alice Springs supermarkets usually comes from at least as far away as Adelaide (which is 1500 km away). They could watch the 4 minute YouTube video, *The Food Miles Challenge* to prompt them.
<http://www.youtube.com/watch?v=uTU7-x2OTa8>
4. Create a mind map on the board of detailing key concepts they have learnt about food miles
5. In small groups get the students 3-5 minutes to list all the possible solutions they can think of to reducing food miles given what they have learnt.
6. Give the groups an opportunity to briefly share some of these solutions – adding them to the mind map as you do.
7. Options to creatively communicate the students understanding of food miles are given below in lesson 2.

The activity: Lesson 2

Option 1) Give the students an opportunity to develop either a comic strip (see **Resource 5**) or a series of plays (in groups of 2) that explains: what are food miles, how people use food miles by the food they eat and four to five ways in which people can try to reduce their food miles. Remind them these comic strips or series of plays need to be informative but can also be funny. Demonstrate a possible start to either the comic strips or the plays to inspire the students. Note: If your students prefer to do an online comic strip – they can use online tools like Chogger <http://chogger.com/creator> instead. On completion, encourage the students to share their work.

Option 2) Ask the students to choose research or develop a recipe that uses at three or four foods from the list of foods available at the Alice Springs Community Garden. Students can share their recipes – noting the food miles that have been saved by using locally sourced ingredients.

Discussion Question: How do you think learning about food miles will affect the way you shop?

In summary: Our trip to the Alice Springs Community Garden has shown us some practical ways you can reduce food miles and your impact on the environment. Next time you are in the supermarket, try and see where all the food is coming from to help you decide which food is grown the closest to home and has the least food miles. This way you can reduce your impact on the planet simply by buying food grown closer to home.

Sustainable use of water – Water efficient gardening



Alice Springs' water is pumped from the Mereenie Aquifer at the Roe Creek about 15 km from the town centre. The aquifer is currently around 150 metres deep and is dropping by around 1 meter per year due to water extraction for the town. There is still a lot of water in the aquifer, but as the level drops bores need to be deepened and more bore holes drilled. This is very expensive and uses lots of electricity.

Currently, Alice Springs residents use about three times the Australian daily average water use, with most of this water (an estimated 65%) going straight onto the garden (Power and Water website 2013). Given this, the best way Alice Springs residents can reduce their water use is by reducing the amount used on our gardens.

This module will introduce students to issues with Alice Springs water and, using the community garden as a model, demonstrate some simple ways that they can use water more wisely in the garden.

To read up on Alice Springs water more go to: <http://alicewatersmart.com.au/why-save-water/alice-springs-water-supply>

Pre-visit: Saving water in Alice Springs gardens

Subject area: Geography

Suggested timing: 50 minutes

Summary: This lesson introduces students to Alice Springs' water: where it comes from, how we use it and how we save lots of water just by using it more wisely in the garden.

Student outcomes: Students will learn:

- where Alice Springs' water comes from and where most of it goes;
- why saving water in the garden in Alice Springs is important;
- what the five principles for designing a water smart garden are.

Materials

- Copies of **Resource 6: Saving water in Alice Springs gardens**
- AWS Water Efficient Gardening (3:16) <http://www.youtube.com/watch?v=cZFcVeMSakQ>
- YouTube Clip: AWS Water Smart Garden Irrigation (3:28) <http://www.youtube.com/watch?v=FgpYamPlzyY>
- Power and Water website: <http://www.savewater.com.au/powerwater/alice-springs-and-central-australia>

The activity

1. Conduct a 10 minute discussion to determine students' prior knowledge on Alice Springs water using the following questions. Suggested discussion tools are included in brackets.
 - Where do you think Alice Springs' water comes from?(List suggestions)
 - Do you think this water is running out or is there plenty there?
 - Where do you think people in Alice Springs use the most of their water? (List the places on the board and ask students to rank them)
 - What do you think are some good ways to save water in the garden? (List them on the board) Have you done any of these?
 - Do different plants need different amounts of water?
 - How might knowing this change the way you might water your garden?
2. Explain to students that in this lesson, they will be conducting some research to answer some of these questions in preparation for visiting the Alice Springs Community Garden.
3. Hand out **Resource 6**, noting that the answers to Q 1, 2 and 3 can be found on the Power and Water website and the answers to Q 4, 5 and 6 will be shown in two short YouTube clips (see materials for the links).
4. Give the students 15-20 minutes to research the answers to Part A on the Power and Water website.
5. For Part B, students can play the YouTube clips themselves (if there are sufficient computers with earphones). Alternately, it may be simplest to view these clips together as a group.
6. Once the students have completed their answers review their answers together, particularly the 5 features of a water efficient garden.
7. Ask the students what they have learnt about making a water efficient garden from their research and compare this to their original thoughts in the prior knowledge discussion.
8. If you have time view and discuss AWS Water Smart Garden Irrigation (3:28) <http://www.youtube.com/watch?v=FgpYamPlzyY> . Otherwise ensure you have watched and discussed this video previous to the excursion.

In summary: This lesson showed you why it is important to save water in Alice Springs, how the garden is the easiest place to make the savings and some ways do that. Now we have an idea about what makes a water efficient garden, we are going to look at a garden that was designed to save water and grow food during our visit to the Alice Springs Community Garden.

On-site: Auditing the water efficiency of the Alice Springs Community Garden

Subject area: Geography and Maths

Suggested timing: 50 minutes

Summary: Students will review the water efficiency of the Alice Springs Community Garden using the five principles for water smart design (from the last lesson's video).

Student outcomes: Students will learn to:

- recognise the features of a water efficient garden;
- and practically apply water smart design principles to review the effectiveness of the design of the Alice Springs Community Garden .

Preparation: If make sure you have viewed and discussed AWS Water Smart Garden Irrigation (3:28)

<http://www.youtube.com/watch?v=FgpYamPlzyY> to gain an overview on different irrigation types previous to the excursion.

Materials

- Copies of **Resource 7**
- Clipboards and pencils
- A compass (if available)

The activity

- 1) Remind students of the 5 principles of for water smart garden design that you learnt from the Water Smart video and let them know today they are going to use these principles to investigate how water efficient the Alice Springs Community Garden is. Also briefly review the different types of irrigation from the irrigation video.
- 2) Put students into groups of two and hand out **Resource 7**.
- 3) Take the students through section one of **Resource 7**, explaining all the things they need to look for. Then show them the map of the community garden in section two, reminding them that they will need to mark on the map the swales, the directions of the compass and any possible leaks the find. Point out the general east, west, north and south directions so the students will be able to use those points on their map work out the orientation of garden beds.
- 4) Explain that they will have 30 minutes to complete the audit and the questions in **Resource 7** by walking through the garden and looking for evidence of water efficient practises and noting them in the audit.
- 5) Give the students 30 minutes to walk through the garden and complete **Resource 7**. Ensure you also walk through the garden helping students that may be stuck or needing some inspiration.
- 6) After the allotted time, regather the students and discuss what they found.

Discussion Questions

- What examples of water efficient garden design did you find?
- Did you find any problems with water use in the garden?
- What could be done to fix them?
- Was there any questions that were really tricky to answer? What other information would we need?
- What information don't we have to know if the water is really used efficiently? How would we find it?
- Would you say from your observation that the Alice Springs Community Garden is a water efficient garden? Why/ Why not?

In summary: Using water efficiently saves money and the environment. Hopefully, this lesson will have shown you that this is possible. However, the most well designed gardens can still waste lots of water by leaving the irrigation of too long or through leaks in the system. Next lesson, we'll have an opportunity to use what we've learnt to make our own water smart garden design.

Back-at-school: Planning your own water efficient garden

Subject area: Geography and Maths

Suggested timing: 50 minutes

Summary: Students will develop their own garden plan showcasing water efficiency measures discussed in the Alice Water Smart video and in the Alice Water Smart Fact Sheet.

Student Outcomes: Students will learn to:

- use their knowledge of water efficient gardens to develop a plan of their own water efficient garden.

Materials

- Copies of *Alice Water Smart Fact Sheet: water smart garden design in Alice Springs*:
<http://www.alicewatersmart.com.au/sites/default/files/PDF's/Water%20smart%20garden%20design%20in%20Alice%20Springs%20-%20Fact%20Sheet.pdf>
- Copies of **Resource 8**
- Review the YouTube clips from the pre-visit lesson
- Alice Water Smart's online Garden Watering Planner: <http://www.alicewateringplanner.com.au/>



The activity

- 1) Discuss the water savings features the students found at the Alice Springs Community Garden and tell them that today they will have an opportunity to take what they have learnt about water saving garden design to design their own water saving garden.
- 2) Hand out **Resource 8** and explain the features they will need to show on their water smart garden design. Remind them of the 5 principles of a water efficient garden design.
- 3) Hand out copies of *Alice Water Smart Fact Sheet: water smart garden design in Alice Springs* and read the information together.
- 4) If you have time, revisit the two YouTube clips (from the pre-visit lesson) to refresh students on water smart garden design.
- 5) Give the students 20-30 minutes to develop their own water smart garden design. Suggest they use their own garden at home and see if they could add some water smart features.
- 6) Conclude this lesson by giving students the opportunity to share their garden plans and explain to the class how they have incorporated water saving features into their garden plan (see discussion questions).
- 7) As an extension, students could view Alice Water Smart's online Garden Watering Planner: <http://www.alicewateringplanner.com.au/> to develop a watering schedule for the different parts of their garden.

Discussion Questions:

- What were the challenges you encountered as you designed your water efficient garden?
- What water efficient features were easy to include in your design? What ones were harder?
- What is missing from your design to ensure that water isn't wasted?

In summary: Making a water saving garden in Alice Springs can be done; however, it does take a lot of thinking. By making a water saving garden we could save our families money, as well as reducing the amount of drawdown on our water supply.

Sustainable use of waste – Composting



What is Compost?

Compost is a type of fertiliser made from rotting plants. To make compost you need to mix food scraps, with other organic waste such as leaves and grass clippings. If the compost pile is kept wet, regularly turned and has the right amount of browns (like grass clippings) to greens (like vegetable scraps), the compost will be ready in 3-6 months. The compost will go from looking like vegetable scraps, grass and leaves, to a rich brown soil-like substance. Compost then can be mixed in with the soil in the garden to grow plants.

Composting is a great way to reduce the amount of waste in our bins that goes to the tip and whilst creating your own fertiliser. Normally, organic waste rotting at the tip produce a lot of methane. Methane is a gas that is about 20 times as bad as carbon dioxide for increasing global warming. If you properly compost organic waste, a lot less methane is produced.

Many people do not compost because they think it is too messy, smelly or time consuming. This module gives students chance to explore composting hands on, see how composting works and the chemical and physical changes that occur during composting. They will do this by looking at the compost piles at the various stages of decomposition and recording physical and chemical changes that occur. The Alice Springs Community Garden provides a perfect setting for this, with its extensive multi-staged composting area.

Pre-visit: Introduction to Composting

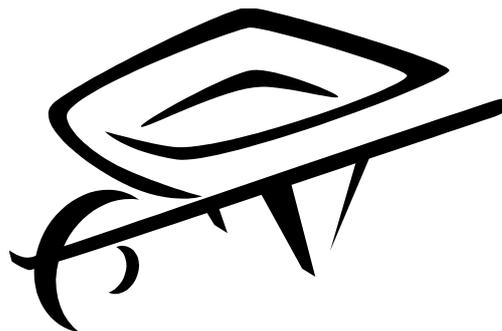
Subject area: Geography and Maths

Suggested timing: 50 minutes

Summary: If you plan on conducting the composting investigation, Costa's introduction to composting and the accompanying worksheet is the perfect background to this module.

Student outcomes: Students will learn:

- what composting is and how composting works;
- how composting reduces waste and greenhouse gas emissions;
- and physical and chemical changes that occur to waste as it decomposes to make compost.



Background notes for teachers: See **Resource 9a Composting Fact Sheet**

Materials

- Copies of **Resource 9**
- Video: *Costa's Guide to Household Composting* (3:31)
<http://www.youtube.com/watch?v=HngvowScx6g>
- Copies of **Resource 9a Composting Fact Sheet**

The activity

- 1) By way of introduction, show the students the three minute YouTube clip *Costa's Guide to Household Composting* giving them time to answer the questions in **Resource 9**.
- 2) Explain decomposition and how composting uses bacteria to breakdown organic matter in a little more detail (see **Resource 9a**)
- 3) Put students into small groups with the **Resource 9a Composting Fact Sheet** and ask them to prepare a list of the advantages and disadvantages of composting at home.
- 4) Share the list between groups.
- 5) Conduct a concluding group discussion using discussion questions below.

Discussion Questions

- Why do you think it's a good idea to compost?
- Why do you think many families choose not to compost?
- What about your house – has anyone here got a compost heap at home? How do you use it?

In summary: Remind the students that this activity will help them when they visit the Alice Springs Community Garden and see firsthand how composting works.

On-site: Composting in the Alice Springs Community Garden

Subject area: Geography and Maths

Suggested timing: 50 minutes

Summary: Students will observe the compost piles at different stage of decomposition taking note of how the waste changes from waste to compost.

Student outcomes: Students will learn to:

- derive conclusions the different stages of composting through observing, measuring, and recording and graphing physical changes at the different stages of the composting process;
- gain a deeper understanding of the physical and chemical processes of composting through firsthand observation.

Background notes for teachers: Use **Resource 9a Composting Fact sheet**

Materials:

- Copies of **Resource 10**
- Gloves
- Thermometers
- Shovel
- Camera/ or phones with cameras

The activity

- 1) Introduce the activity by telling the students that today is an opportunity to have a look at composting firsthand and see how compost is made and it changes over time from recognisable waste to black fully decomposed compost. They will see the ingredients for compost and several compost piles at different stages of decomposition, seeing how it changes along the way.
- 2) Break the students up into four groups and take them to the composting area of the community garden.
- 3) Each group will investigate the appearance, temperature, and stage of decomposition of one of four stations.
- 4) Label the stations one to four: one being the ingredients for composting, two being freshly composted compost pile, three being more decomposed compost pile and four being almost completely composted compost pile. Explain to each group that they will travel around the stations having 5 minutes at each station to record the appearance temperature and level of decomposition for each pile. They will take photos of their activities, for use in the next lesson.
- 5) Explain how active decomposition creates heat due to the metabolism of the bacteria in the waste. Hence, a really active compost heat will be towards 50-65 °C.
- 6) Hand out copies of **Resource 10** and explain to students that they will need to complete the equipment list, observations for each of the four stations and the discussion questions.
- 7) Demonstrate to students how to take the temperature of the compost pile and record their observations in **Resource 10**.
- 8) Allocate groups to stations and give groups 5 minutes to complete compost profile before moving on to the next station. Get students to take photos of each station which you may use for the next lesson.
- 9) After all stations have been complete, review the student's data and use the discussion questions from **Resource 10** to prompt a discussion.

In summary: Composting changes recognisable food scraps and plant waste into a fine organic matter that can be used for fertiliser. Conclude the lesson by reminding students that the information they learnt today and the photos will be used to make a PowerPoint or poster back at school.

Back-at-school: Composting in Alice Springs Community Garden

Subject area: Science and Geography

Suggested timing: 50 minutes

Summary: The students will use the information and photos derived from visiting the Alice Springs Community Garden to develop a poster or PowerPoint promoting composting as green recycling.

Student outcomes: Students will learn to:

- use information derived from their own experiences in the on-site activity to creatively communicate the composting story.

Materials

- Completed **Resource 10**
- Photos from the Alice Springs Community Garden
- A3 paper and pencils / computers (depending on whether doing PowerPoint or Poster)

Preparation

Ensure that the photos from the Alice Springs Community Garden are available for student use and the students have their completed copies of the excursion work sheet (**Resource 10**).

The activity

- 1) Recap on what the students learnt from the excursion.
- 2) Tell the students that today they are going to use the information we learnt from visiting the Alice Springs Community Garden to develop their own poster or PowerPoint to promote the value of composting.
- 3) The PowerPoint or poster will need to promote the composting story as green recycling and include the key elements of : what is composting, how composting works, a flow chart showing how composting turns ingredients such as grass clippings, cow manure and food waste into usable fertiliser.
- 4) Encourage the students to use photos from the day and results from the day to illustrate their point.
- 5) When students have completed their poster or presentation encourage them to share their work with one another.

Discussion Questions

- Can you see and opportunity to compost either at school or at home based on this experience?
- What do you think might stop you or the school doing this?

Possible additional activities: If you have time consider giving students the opportunity to make their own micro compost at school. There are plenty of examples of how to do this on line (try “compost in a bottle” or “compost in a milk carton” as search terms). http://www.teachertube.com/viewVideo.php?video_id=55471

In summary: Composting is a practical hands on way of reducing waste, greenhouse gas emissions and make usable fertiliser using food or garden waste.

Alice Springs Community Garden Excursion Guide Resources

Resource 1: What is a community garden?

Section A: Questions from the Video *Kim Hopper: Community Gardener* (2:15) <http://vimeo.com/54409138>

1) List the activities you can see people doing in the garden.

2) What types of fruit or vegetables can you see being grown at the garden?

3) What does Kim think community gardens are for?

4) How is the community garden social according to Kim?

5) At working bees people spent half their time working. What does Kim say people spend the other half of their time on?

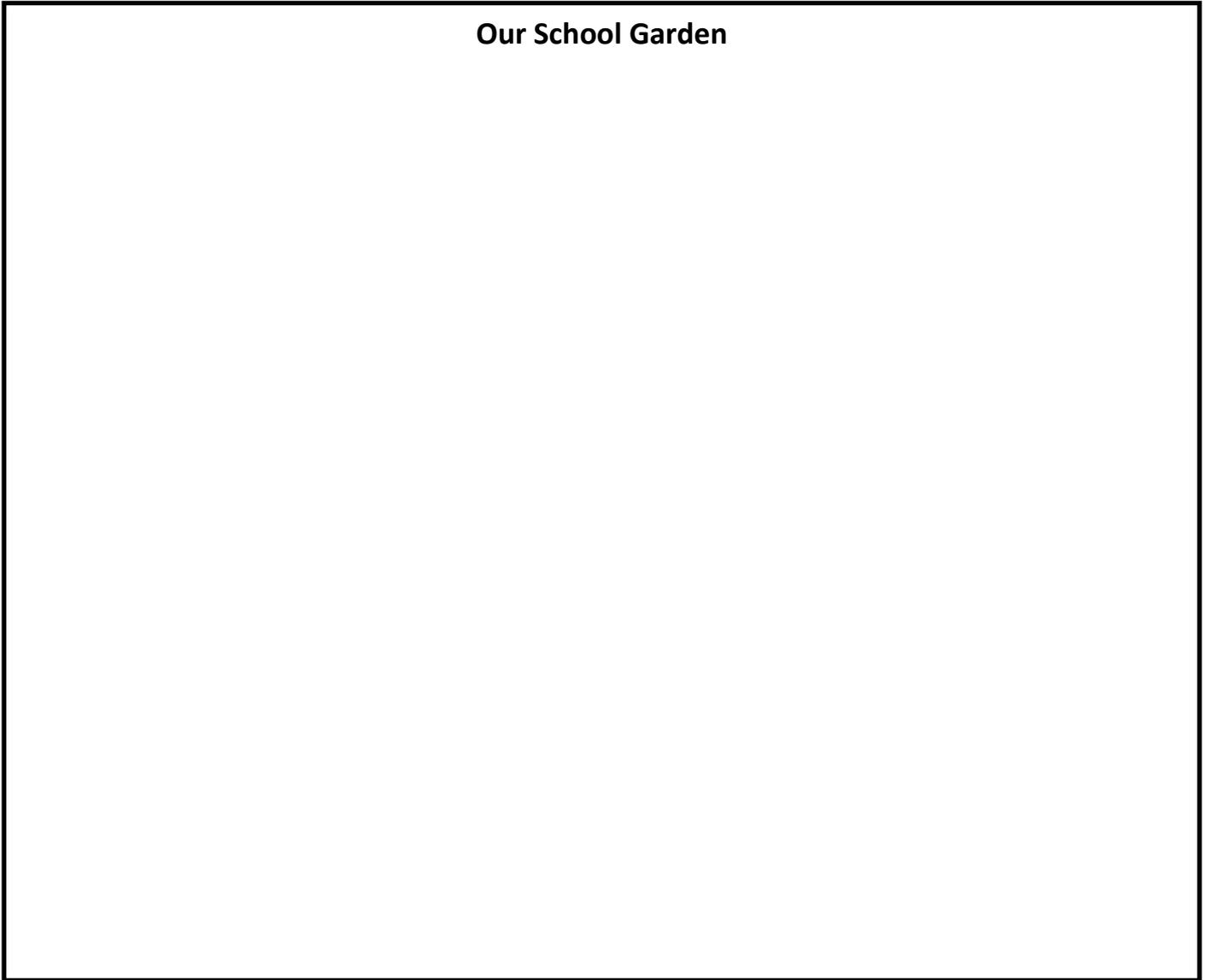
Reflection Question

6) Why do you think people like being part of a community garden?

Option 1: Section B: Looking at our own garden

1) Draw a map of your schools garden in the box below (bird's-eye view). On the map show and label the garden beds, food plants, compost area, and the irrigation system. Use the legend below to show the food plants.

Our School Garden



2) Create a legend for the above map by listing all the food plants you can see and giving them a symbol. Use the symbol on the map above to show where they are.

Plant name	Symbol

Option 2: Section C: Research a Community Garden

On the internet research a community garden in Australia and answer the questions below. You could research the Alice Springs Community Garden (alicecommunitygarden.org.au) or other community gardens community in Australia. **Suggestion:** Type in the name of any town and community garden into a search engine and see what comes up.

1. What is the name of the community garden?

2. Where is it located?

3. How long has the community garden been going?

4. What are some things that happen at the community garden?

5. How do you get a plot at (or join) the community garden?

6. Look carefully at the images on the website and see if you can find any food that grows in the garden. List them below.

Resource 2: Alice Springs Community Garden Treasure Hunt

Explore the garden to find an item for each clue. If you look closely, you might find more than one answer. If you know the name of the plant write it in, otherwise simply draw the item in. Please note: be careful not to step in the garden plots as you could damage the plants. Please share your answers with your friends.

A plant that smells good	Small yellow flower	Grows a purple fruit
Green leafy vegetable	A tap	Something very smelly
An insect	A bee	A plant that needs a stick to support it
Something that look like a person	Something pink	A leaf you can eat
Something that makes shade	A place to sit	A fruit tree
A native food plant	Leaf with prickles	Something used to cover the garden beds
Orange flower	A seed pod	A stem you can eat
Something that carries water	Something that carries hay	Something new

Resource 3: Where does our food come from?

1) Using the food supplied and the labels that show the distances complete the first two columns of the table. Then using a table please complete the 3rd column to work out how far it has travelled.

Working out food miles and carbon emissions

Food	Where is it from?	Distance to Melbourne (km)	Grams of CO ² Produced for 1 kg (km)	Distance from Melbourne to Alice Springs (km)	Grams of CO ² Produced for 1 kg (km)	Total CO ² produced for 1 kg
1) Tuna	Thailand	8000	=8000 ×.13=1040	2225	=2225 ×.27=601	1040+601= 1641
2)						
3)						
4)						
5)						
6)						
7)						
8)						
9)						
10)						
Total						

Grams of GHG emissions per km travelled for each kg of food (Environment Canada 2002)

Transport type	Grams of greenhouse gas emissions per km travelled for each kg of food
Truck	.27
Train	.02
Boat	.13
Plane	1.1

1) Is this surprising to you? Why?

2) How could you change your eating habits to reduce your food miles?

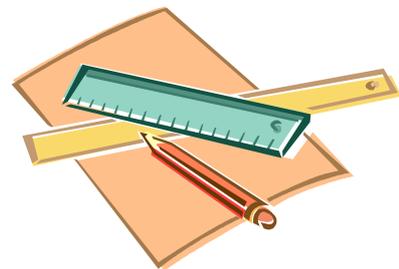
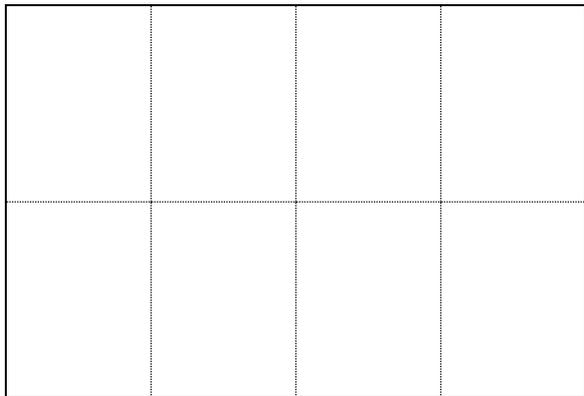
3) How could growing food in home gardens or community gardens reduce our food miles?

Extension

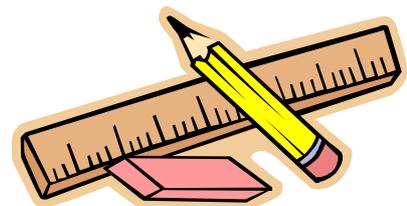
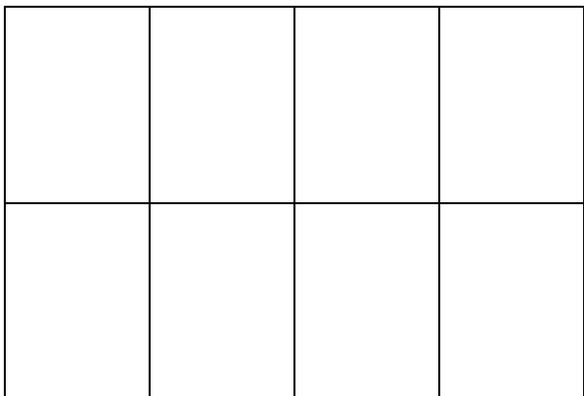
3) For each of the products, research whether there is an Australian grown alternative?

Resource 5: Making a food miles comic strip

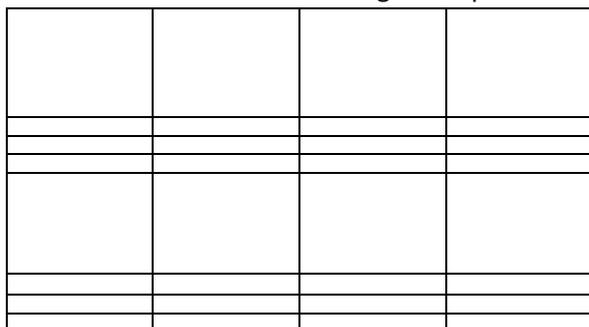
1) Get an A3 piece of paper and fold it into 8 even rectangles so it looks like this:



2) Rule up over the folds using a grey lead pencil. Each of the rectangles will be a cartoon box. If you do both sides of the paper you will have 16 boxes to complete.



3) Rule each box in half. Leave the top half of the boxes blank for the illustration and rule lines in the bottom half of the boxes for writing the captions.



- 4) Now complete your comic strip on food miles. Like all comic strips use pictures with speech bubbles and thought bubbles in the top part of the box, and captions explaining the story in the ruled lines.
- 5) Make sure your cartoon shows: what food miles are, how people use food miles by the food they eat and four to five ways in which people can try to reduce their food miles.

Resource 6: Saving water in Alice Springs gardens

Part A: Question to be answered from the Power and Water Website

<http://www.savewater.com.au/powerwater/alice-springs-and-central-australia>

1. Where does Alice Springs' water come from?

2. How much water do Alice Springs residents use every day?

3. How does this compare with the rest of Australia?

4. Is the amount of water at Roe Creek decreasing? And if so, by how much each year?

5. Where does most of the water Alice Springs residents use end up?

6. Why is reducing water use in the garden so important for saving water?

Part B: Questions to be answered from YouTube Clip

See Alice Water Smart Water Efficient Gardening (3:16) <http://www.youtube.com/watch?v=cZFcVeMSakQ>

1. What are the five principles of Water Smart Design? Please give an example for each.

1.
2.
3.
4.
5.

2. What are some things you should think about when planning a new garden?

3. Should you put native plants and vegies on the same line? Why not?

4. A swale is a depression designed to keep rain water from running off. How could using a swale save water?

5. What is mulch, and how does it help you save water?

Resource 7: Auditing the water efficiency of the Alice Springs Community Garden

Complete this form to see if the Alice Springs Community Garden follows the five important principles for water efficiency gardening (plan your garden, group your plants, use the right irrigation equipment, catch rainwater and use mulch). To ensure you complete the form correctly, mark the directions onto the map of the community garden overleaf.

Section 1: The audit

Plan your garden		
Are sun loving plants like natives or tomatoes or capsicum on the north / west facing side?	Yes: No Explain:	
Are shade loving plants – greens (like spinach or lettuce) on south or east facing sides?	Yes: No Explain:	
Can you see any other evidence that the garden has been planned around the direction of the hot sun/ or shade?	Explain:	
Group your plants	Yes/ No	Example
Are natives on the same irrigation line?	Yes: No	
Are fruit trees all on the same irrigation line?	Yes: No	
Are veges all on the same irrigation line?	Yes: No	
Can you see any examples where this hasn't happened?	Explain:	
Use the right irrigation equipment	Circle the one	
What types of irrigation can you find for natives	Dripper Sprays	Brown miniscape Other...
What types of irrigation can you find for fruit tree	Dripper Sprays	Brown miniscape Other...
What types of irrigation can you find for vegetables	Dripper Sprays	Brown miniscape Other...
Are these the right type of irrigation for these plants?	Yes: No Explain:	
Is there evidence that natives, fruit trees and veges are on different lines?	Yes: No Evidence:	
Can you see any evidence of leaks? If so what is the evidence and where is it?	Yes: No Evidence of leak: Where are they:	
Can you find a place where a timer system may be hidden?	Yes: No Where:	
Can you find a pressure regulator?	Yes: No	
Is there a way to turn off the water to vegetable beds that are not in use?	Yes: No Explain:	
Catch rainwater		
Can you find any structures like swales that have been designed to hold water on-site?	Yes: No Where?	
Use Mulch		
Are the garden beds mulched?	Yes/ No Type of mulch used: Other comments:	

Section 2: Map of the Alice Springs Community Garden



Mark the following on your map
Swales
Directions N,S, E ,W
Places where there is evidence of leaks

Questions

1) From your audit of the garden, what ways does the Alice Springs Community Garden use the five important principles of water efficient garden design? Explain.

2) Are there any problems that they should fix up to make the garden truly water efficient? Please detail.

3) Overall do you think the Alice Springs Community Garden is a water efficient garden? Why/ Why not?

Resource 9: What is composting?

Questions from the YouTube clip: *Costa's Guide to Household Composting* (3:31)

<http://www.youtube.com/watch?v=HngvowScx6g>

1. What is compost made from?

2. What amount of our organic waste do we throw in the bin?

3. Why is it better for the environment to compost food scraps than put them in the bin?

4. What things should you put in compost?

5. What are some ways you can compost if you have a small garden?

Resource 9a: Composting Fact Sheet

Did you know?

- Composting is a great way to reduce the amount of waste in our bins that goes to the tip and you're your own fertiliser for the garden.
- Normally, organic waste such as food scraps rotting produces a lot of methane. Methane is a gas that is about 20 times as bad as carbon dioxide for increasing global warming. If you properly compost organic waste, a lot less methane is produced and you get a heap of good quality fertiliser for free.



What is Compost?

Compost is a type of fertiliser that is made from rotting plants. To make compost you need to mix food scraps, with other organic waste such as leaves and grass clippings. The vegetable waste is broken down by bacteria (germs), and made into compost.

Some good types of waste to go in a compost pile are: vegetable/fruit peels and scraps, spoiled, rotten or mouldy fruit, cut grass, composted cow/ chicken manure, leaves, straw, sawdust and eggshells. Compost is made by making a pile of layers of different waste on top of each other and wetting down the mixture. To make the composting work well, the compost pile must be turned regularly. This lets air in so the waste can break down quickly.

You can tell if composting is happening well as the compost heat heats up. A good compost heap should be at between 50-65 degrees C. This heat is caused by all the bacteria breaking down the organic materials. If the compost pile is kept wet, regularly turned and has the right amount of browns (like grass clippings) to greens (like vegetable scraps), the compost will be ready in 3-6 months. The compost will go from looking like vegetable scraps, grass and leaves to a rich brown soil like substance. Compost then can be mixed in with the soil in the garden to grow plants.

Composting can be messy and even a little smelly and takes up space- with the suggested area for a compost heap being around 1 metre squared. You can also buy smaller composting bins. Many people do not compost because they think it is too messy, smelly or time consuming. Some schools compost all their food scraps for their own gardens. Many local councils manage their own huge compost piles at the tip and collect all residents green waste and food scraps in a separate bin each week to add to this compost system. They then sell the compost back to local residents for their gardens.

The compost at the Alice Springs Community Garden is made from a mixture of dried grasses cleared from the site, mixed with cow manure and other garden clippings from the site.

Resource 10: Observing composting in action at the community garden

Aim: To observe composting in action at the Alice Springs Community Garden

Equipment:

Observations:

Ingredients	Draw ingredients here
List the ingredients:	

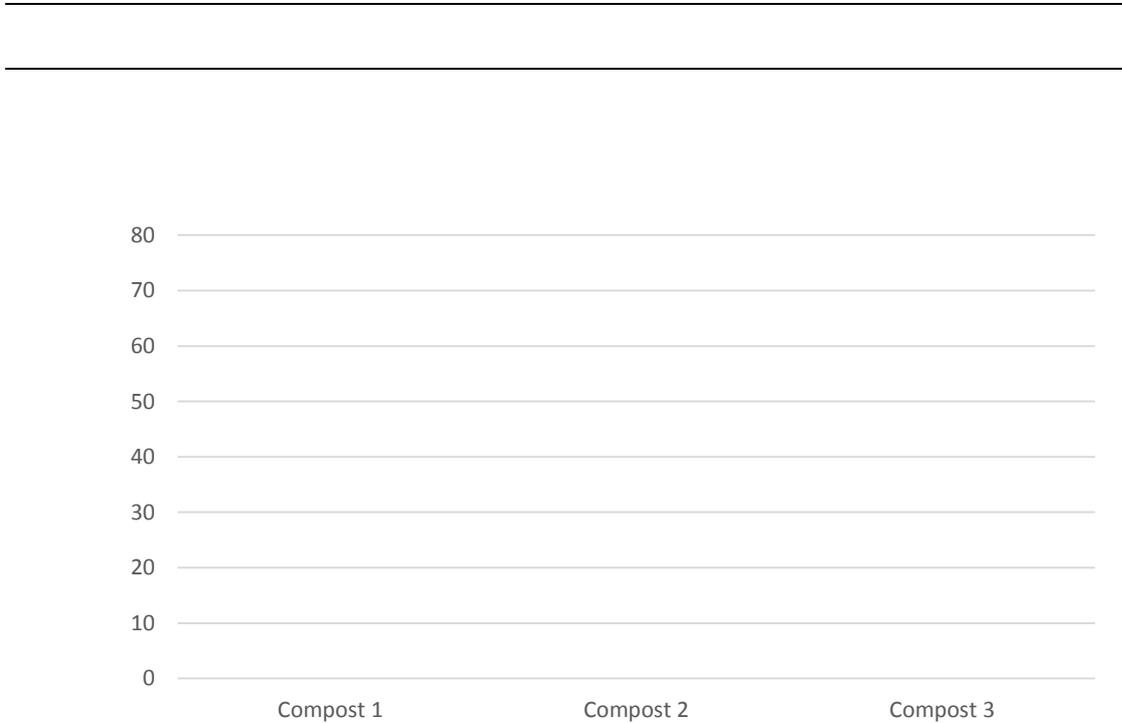
Compost 1	Draw compost 1 here
Compost container:	
Appearance/ colour:	
Smell:	
Temperature:	
Scale of 1-10 – how well composted do you think it is?	
What is the evidence for this?	

Compost 2	Draw compost 2 here
Compost container:	
Appearance/ colour:	
Smell:	
Temperature:	
Scale of 1-10 – how well composted do you think it is?	
What is the evidence for this?	

Compost 3	Draw compost 2 here
Compost container:	
Appearance/ colour:	
Smell:	
Temperature:	
Scale of 1-10 – how well composted do you think it is?	
What is the evidence for this?	

Results

- 1) Complete the graph below by adding the temperature of the 3 piles. Don't forget to also add a title and label the axes.
- 2) From the graph below – what can you conclude about the temperature of compost as it breaks down?



Discussion Questions

- 1. What ingredients do they use at Alice Springs Community Garden to make the compost?

- 2. What do you think they do with the compost after it is made?

- 3. Which stations were actively composting? How did you know?

4. Which stations were not actively composting? How did you know?

5. Did you see anything unexpected in your research? If so, what?

6. Given what you have seen, is composting recycling? If so what is it recycling?

7. Has looking at compost closely changed your attitude to composting? If so how?

Teacher Resource Sheet 1: Food labels for Where does our food come from?

Food Name	Location	Approx Distance to Alice Springs
Grapes	Mildura (Vic)	2100 km
Tomatoes	Bowen (Qld)	3500 km
Zucchini	Tasmania	2200 km
Oranges	Gayndah (Queensland)	3300 km
Potatoes	Port Fairy via Melbourne	2600 km

Food Name	Location	Approx Distance to Melbourne
Tuna	Thailand	7 315 km
Olive Oil	Spain	17 372 km
Tinned Tomatoes	Italy	16 017 km
Coconut Milk	Malaysia	6 399 km
Rice Crackers	Thailand	7 315 km