

Activity

Tools and their functions




Examining the tools in this activity, make some observations about their size, shape and features that enable each tool to be used effectively. List the activities you would use the tool for in the garden, thinking about how the tool works and what job it might be right for. You may also examine how this tool helps make the job easier and how it can be used safely.

This activity is designed in two parts. In part 1, images of the tools are provided along with a list of the tools' names. Identify what each tool is and complete the table. In part 2, you are given a list of suggested tools and you will draw them into the table yourself. The suggested list is not a list of every single tool you might come across in the garden, meaning that the only limit in this activity is the tools you have access to.

These activities can be used in whatever way is most suitable to your class and garden.





Part 1

Hand fork Lopper Shears Mulch fork Spade Shovel Metal rake

	Size, shape and features	What is that tool used for?
 Tool: _____		
 Tool: _____		
 Tool: _____		

(continued)

Activity

	Size, shape and features	What is that tool used for?
 <p>Tool: _____</p>		
 <p>Tool: _____</p>		
 <p>Tool: _____</p>		
 <p>Tool: _____</p>		

Activity

Part 2

Wheelbarrow

Watering can

Leaf rake

Hand trowel

Weeding fork

Tool	Size, shape and features	What is that tool used for?

Activity

Tools and tasks

Based on what you have learned so far, what tools and equipment would you need for these tasks?

Task	Tools and equipment needed
Adding mulch to a garden bed	
Taking cuttings for producing more plants	
Weeding garden beds	
Planting a tree	
Making compost	

Activity

Exploring your garden

Walk around your school garden or grounds and record your observations. You can also draw the various shapes of plant parts, find insects and other small animals, smell flowers and fruits, feel the soil, and discuss with your friends if you think that the garden is wildlife friendly.

Location

Our garden is found at a school that is:

- Inner city Suburban Semi-rural Rural

Our school garden has (tick the boxes):

- | | |
|--|---|
| <input type="checkbox"/> Native bush plants | <input type="checkbox"/> Herbs |
| <input type="checkbox"/> Compost area | <input type="checkbox"/> Seating |
| <input type="checkbox"/> Recycling area | <input type="checkbox"/> Flowers |
| <input type="checkbox"/> Food plants | <input type="checkbox"/> Trees that provide shade |
| <input type="checkbox"/> Walkways and paths | <input type="checkbox"/> Pond or bog garden |
| <input type="checkbox"/> Structures, such as trellises | <input type="checkbox"/> Raised garden beds |
| <input type="checkbox"/> Water supply | <input type="checkbox"/> Rainwater tank |

Are there any items you think your school garden is missing?

Site assessment

Observe the following areas and rate them on the scales provided. Circle the numbers that best match what you have observed.

Soil

Is the soil sandy, clay based or somewhere in between? Rank soil from 1 to 5.

- | | | | | |
|----------|----------|----------|----------|----------|
| Sand | | Loam | | Clay |
| 1 | 2 | 3 | 4 | 5 |

What colour is the soil? Rank the colour of the soil from 1 to 5.

- | | | | | |
|--------------------|----------|----------|----------|---------------------|
| Dark-coloured soil | | | | Light-coloured soil |
| 1 | 2 | 3 | 4 | 5 |



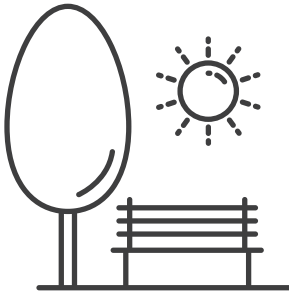
Activity

Weather

How much sun does the garden get? Is it in full sun for most of the day, or is it a mostly shaded garden? Rank the amount of sunlight from 1 to 5. This may vary for different parts of the garden, so you could circle whichever is most common or rank and label different parts of the garden.

Full sun

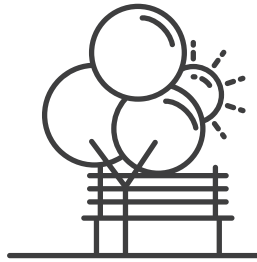
1



2

Partial sun

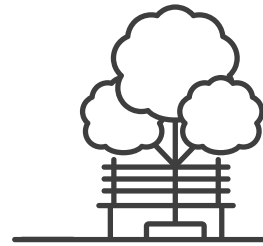
3



4

Mostly shaded

5



How much shelter and protection is available to the garden? Rank the amount of shelter and protection from 1 to 5.

Fully sheltered

1

2

Partially sheltered

3

4

Open to the weather

5

Wildlife habitat

Are there any trees in the garden that can house animals such as birds, possums and insects? Rank the number of large trees for animal habitat from 1 to 5.

Many trees and hollows

1

2

Some trees

3

Few trees and no hollows

4

5

Have the creators of this garden added any human-made animal habitats, including bee hotels, butterfly-attracting structures, frog ponds, nests or root boxes? Rank the number of human-made animal habitats from 1 to 5.

Many different habitats

1

2

Some habitats

3

Very few habitats

4

5



Activity

My observations

Describe the shape, feel, colour and smell of plants; what animals (such as insects, lizards, spiders and birds) you see; what sounds you experience; and what herbs and foods you taste. Observation involves using all your senses to gather information.

I saw



I smelled



I touched



I heard



I tasted



Activity

Illustrations of the garden

Include some drawings of what you found in the garden.

Activity

Shapes of leaves

Plant leaves have many shapes and sizes. Visit the school garden and draw some of the leaves you find. You or your teacher may know some of the plant names, so include any that you know. Use a ruler to measure the leaves to compare sizes. You may also wish to add a short description of the leaf: Is it soft, spiky or rubbery? Is it thick or thin? Does it have long or short veins? These are just a few examples of the things you may notice about your leaves.

<p>Name _____</p>	<p>Name _____</p>
<p>Name _____</p>	<p>Name _____</p>

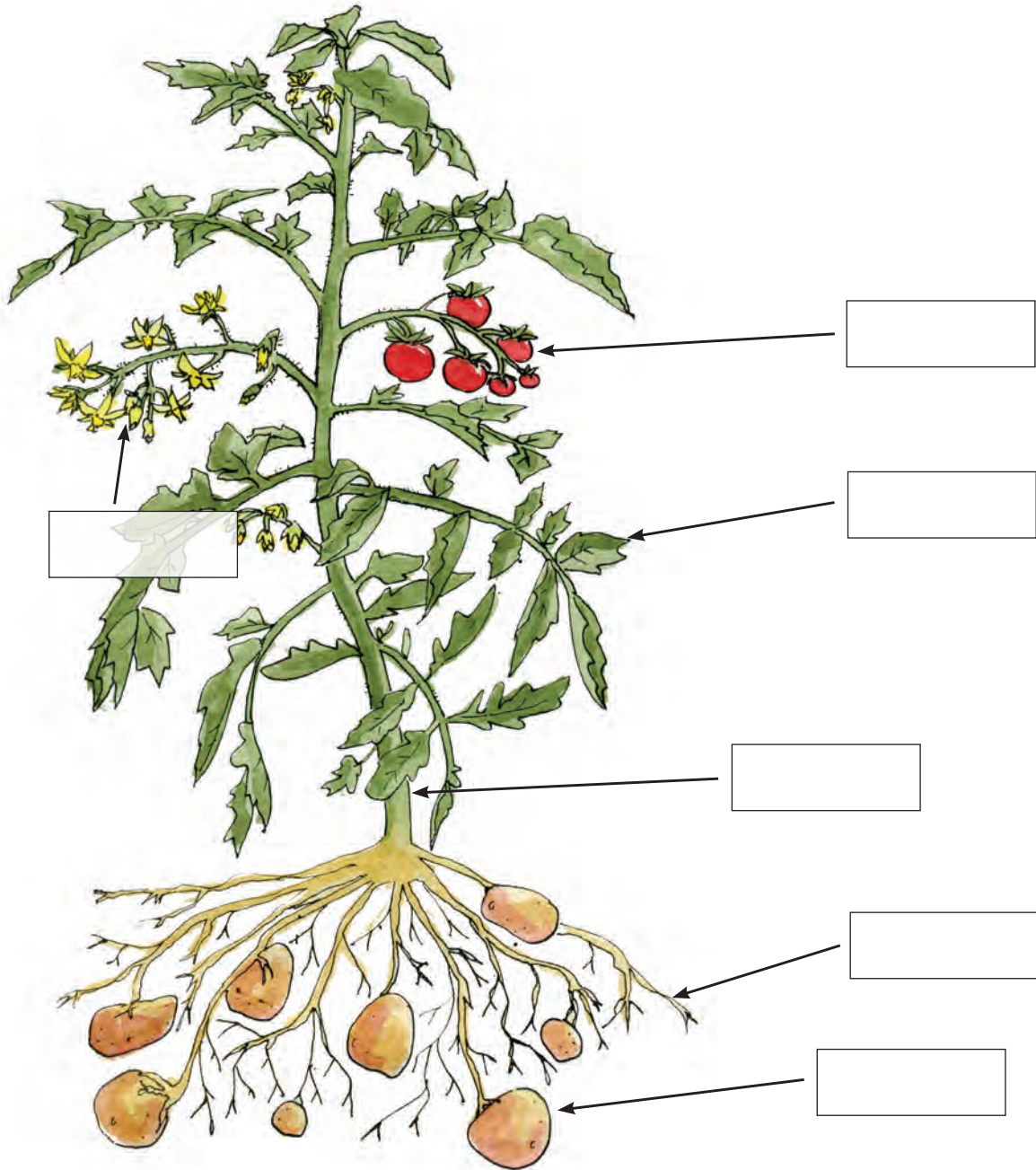
Activity

<p>Name _____</p>	<p>Name _____</p>
<p>Name _____</p>	<p>Name _____</p>

Activity

Plant parts

Observe plants in your garden and read the information provided on page 50. Label the parts of a typical plant on the drawing below.



Which parts makes the fruit? _____

Which part holds the plant and leaves upright? _____

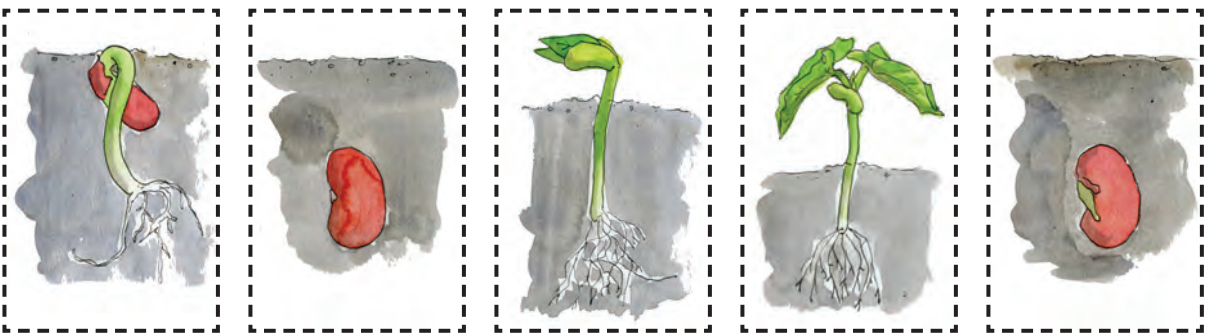
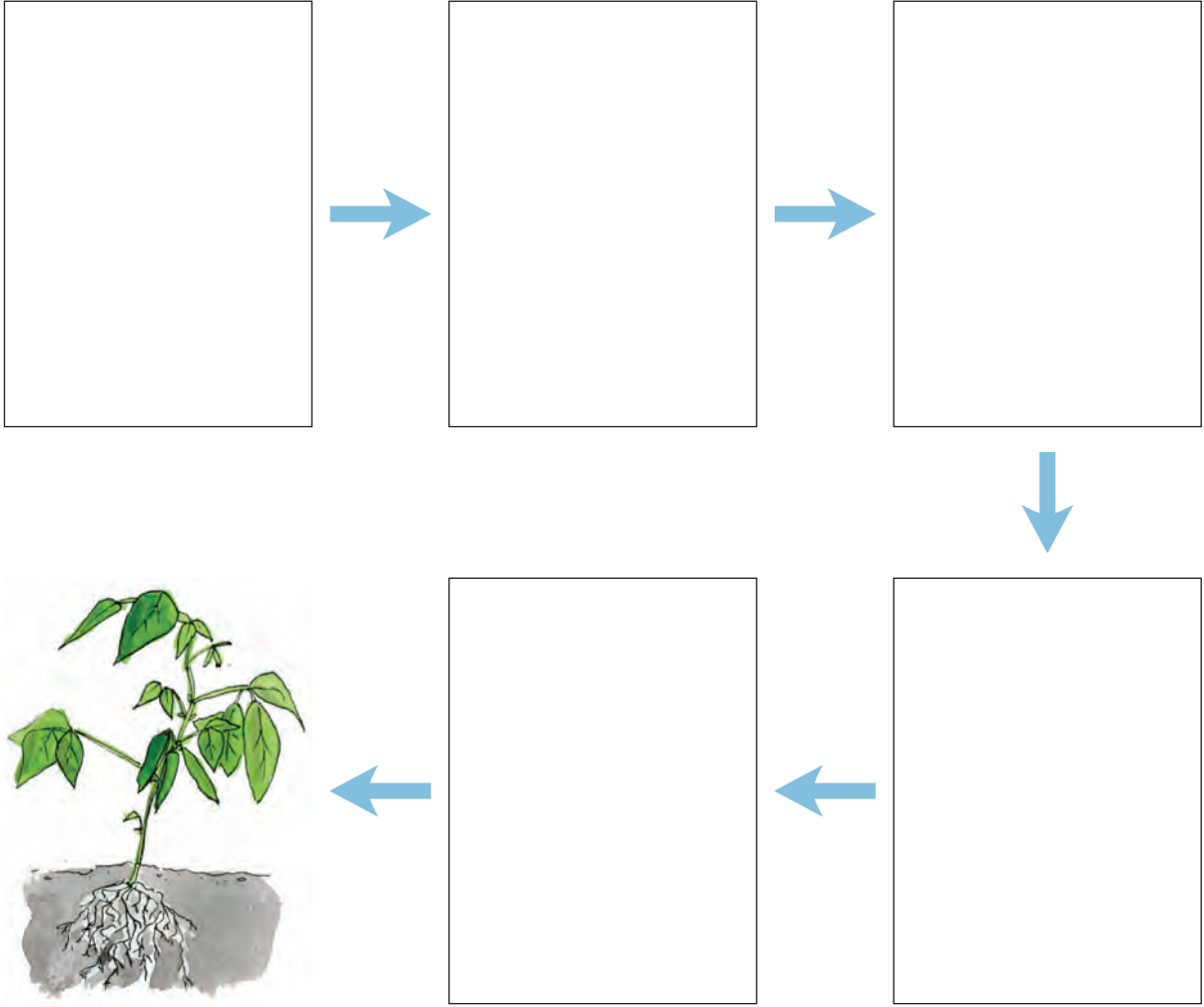
Which part absorbs water? _____

Which part contains seeds? _____

Activity

Stages of plant growth

Cut out the pictures at the bottom of this page and paste them in the correct order that shows how a seed germinates and grows into a plant. Groups may compare their orders, explain why they think each stage goes in each box and discuss their decision-making processes. If there are differing opinions across the group, work together to rework the order until the whole group thinks it is correct.





Project



Growth diary

Plant name:

Planted by:

Date:

Questions

The aim of this experiment is to:

What variables are being kept constant in the control pot?

In this activity you will be collecting data and using evidence to draw conclusions. What is the difference in the meanings of data and evidence?



GROWTH DIARY

Plant Name

Planted by

On

Height: _____ centimetres

Date:

Height: _____ centimetres

Date:

Project



Height: _____ centimetres

Date:

Height: _____ centimetres

Date:

Height: _____ centimetres

Date:

Height: _____ centimetres

Date:

Project



Calculations

1. If you added 10 mL water each day for the duration of the activity, what total volume of water would you have used for each pot?

2. How many litres of water have you used for both pots for the whole of the activity?

3. What is the difference in the height of the plant from the start to the end of the activity? Give your answer in millimetres.

4. How many days has the activity taken?

5. The growth rate of the plant is calculated by dividing the change in height by the number of days. What is your calculation for the growth rate? Express your answer as millimetres per day.

6. Convert the rate of growth into:
 - (a) centimetres per month (30-day month)

 - (b) metres per year

Conclusions

What conclusions can you make from the data you collected? What evidence is used to support these conclusions?

Recommendations

What recommendations can you make to improve this activity to make it more reliable?

Activity

Uses of deciduous trees

Deciduous trees typically lose their leaves in late autumn and early winter as an adaptation to extreme cold. This is because frost and extreme cold may kill the leaves of the plant. There are a few trees in northern Australia that lose their leaves in summer as an adaptation to extreme heat, including white cedar and the boab tree. Some deciduous trees provide fruit, others showy flowers. Some are used as shade trees or for furniture and timber.

This task is a research assignment where you choose one of the listed trees and find out about its characteristics: ultimate height and spread, preferred growing conditions (soil type and climate), and products and uses.

Your teacher may allocate a particular plant to you so that the class covers all listed trees. Their scientific names are given as well. Scientific names often give clues about a plant's characteristics. For example *nigra* means *black*, so this is used for black mulberry and black walnut as well as describing the black berries of the elderberry. *Domestica* means *domesticated* or *tamed*, so ancient types of apples and plums have now become the common fruits we eat today. People use common names to differentiate particular varieties, so when you say 'apple' (all of which are *Malus domestica*), which variety of the many hundreds (such as Granny Smith, Red Delicious and pink lady) are you referring to?

Japanese maple (*Acer palmatum*)

Honey locust (*Gleditsia triacanthos*)

Japanese raisin tree (*Hovenia dulcis*)

Prune (*Prunus domestica*)

Sugar maple (*Acer saccharum*)

Elderberry (*Sambucus nigra*)

Black mulberry (*Morus nigra*)

Maidenhair tree (*Ginkgo biloba*)

Box elder (*Acer negundo*)

Black walnut (*Juglans nigra*)

Fig (*Ficus carica*)

Liquidambar (*Liquidambar styraciflua*)

White poplar (*Populus alba*)

English oak (*Quercus robur*)

Wisteria (*Wisteria sinensis*)

Chinese tallow (*Triadica sebifera*)

Cherry tree (*Prunus avium*)

Apple (*Malus domestica*)

Powton (*Paulownia fortunei*)

Chestnut (*Castanea sativa*)

Walnut (*Juglans regia*)

Pistachio (*Pistacia vera*)

Curry leaf (*Murraya koenigii*)

Pomegranate (*Punica granatum*)

Quince (*Cydonia oblonga*)

Indian bean (*Catalpa bignonioides*)

Desert ash (*Fraxinus oxycarpa*)

Neem (*Azadirachta indica*)

Weeping willow (*Salix babylonica*)

Chinese elm (*Ulmus chinensis*)

Drumstick tree (*Moringa oleifera*)

Claret ash (*Fraxinus angustifolia*)



Japanese maple



Pomegranate



Liquidambar

Activity

Seasonal changes in plants

This activity is undertaken over several seasons. You are to photograph a particular tree that you know is deciduous so that you can record the changes that occur in the plant as seasons change. This may include changes to leaf colour; the number of leaves on the tree; flowering, fruiting and seed production; and new growth (shoots). Examples of trees that have remarkable colour changes include Chinese toon (*Toona sinensis*), liquidambar (*Liquidambar styraciflua*), Japanese maple (*Acer palmatum var. atropurpureum*), sugar maple (*Acer saccharum*) and red maple (*Acer rubrum*).

Select approximately 10 photographs that best represent the events and changes that occurred from the beginning of the year to the end. Print and mount these as a timeline.



Changes in Chinese toon – *Toona sinensis*

Activity

What is so important about water?

Life does not exist without water. Have a think about how important water is and answer these questions.

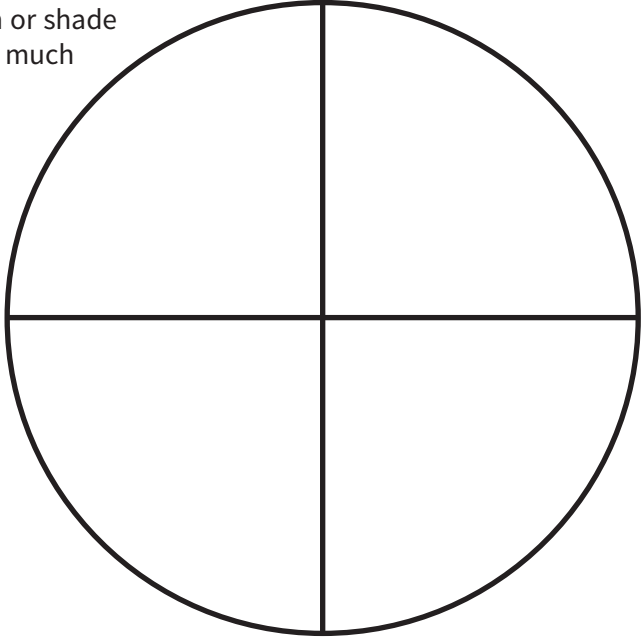
Where do you get water from every day?

List three ways we use water every day.

Why is water important to plants and our gardens?

How much water covers the Earth? Colour in or shade three of these four segments. This is how much water covers the Earth's surface.

What fraction is this?



Activity

Needs and uses of animals

All living things have particular needs so that they can survive in their environment. The needs of plants and animals are similar, but there are some differences too. They also have a variety of different uses, both in their natural habitat and in the wider community.

Directions

Complete this activity in pairs. One student should begin by reading the first question and listing one answer. They should then explain their answer to their partner. They then pass the sheet to their partner, who does the same, listing another answer and then discussing it. The sheet should go back and forth until all questions are answered.

1. Animals have essential needs that must be met if they are to survive. What are some of these needs?

- A. _____
B. _____
C. _____
D. _____
E. _____



2. In what ways do animals and plants differ?

3. In what ways are plants and animals the same?



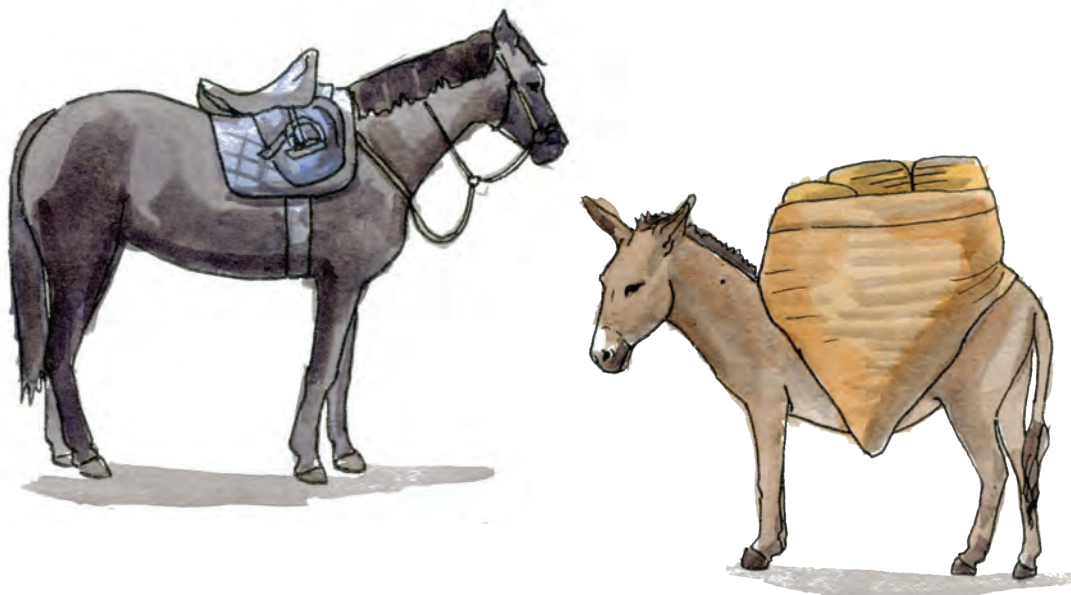
4. Both plants and animals are classified as living things. How do living things differ from non-living things? (What characteristics are common in all living things?)

Activity

5. Animals have many functions in the environments in which they live. Can you think of some functions that animals perform?



6. Humans also use animals to help make work easier. What ways do humans use animals to make work easier and save us energy and effort?



Activity

Animal products and functions

Directions

This activity can be completed individually or in small groups. Select an animal through students calling one out, selecting from the animal list or drawing from a hat. Once the animal is chosen, students have two minutes to write down all the products they can think of that come from that animal. These can be physical products such as meat, milk or wool, or could be extended for older students to include services or functions such as transport, farm work or companionship.

The student who chooses the animal should read out their list. This list can be noted on the board or on a large piece of paper for display in the classroom. Students should be encouraged to share any items on their list that haven't already been said by another student.

If there is an answer that someone does not agree with, teachers should encourage students to explain their reasoning. This could lead to a wider class discussion.

This process continues until all products and functions have been added to the list. Go through each of the animals until they have all been played.

Extension

This activity may also be completed with animals and ecosystems in mind, having students note down the ways that animals serve or play their roles in their specific environment.

Animal list

Duck	Goose	Chicken
Alpaca	Llama	Yak
Cow	Goat	Sheep
Fish	Pig	Horse
Bees	Turkey	Emu

Activity

Animals in schools

Having animals in schools and school farms raises issues about their welfare (health and wellbeing), the likely spread of disease and the provision of appropriate food, housing, pens and other structures. Government legislation protects even small animals such as rabbits, guinea pigs and mice that may be kept in a classroom. Schools usually have an animal ethics committee in place to approve the keeping of animals in classrooms and on the school grounds.

Animal ethics committees

Discuss with the class or your group what you think the role of an animal ethics committee would be and write some of these ideas here.

Animals in the classroom

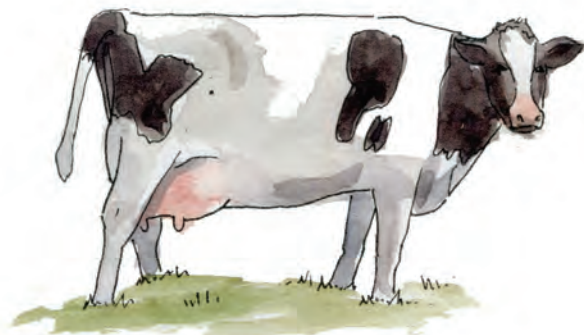
What do you think would be some of the problems and issues that need to be considered if you were to keep animals in a classroom?



Activity

Animals in farm schools

What do you think would be other considerations for keeping larger animals, such as cattle and sheep (livestock), horses and pigs, in farm schools?



Activity

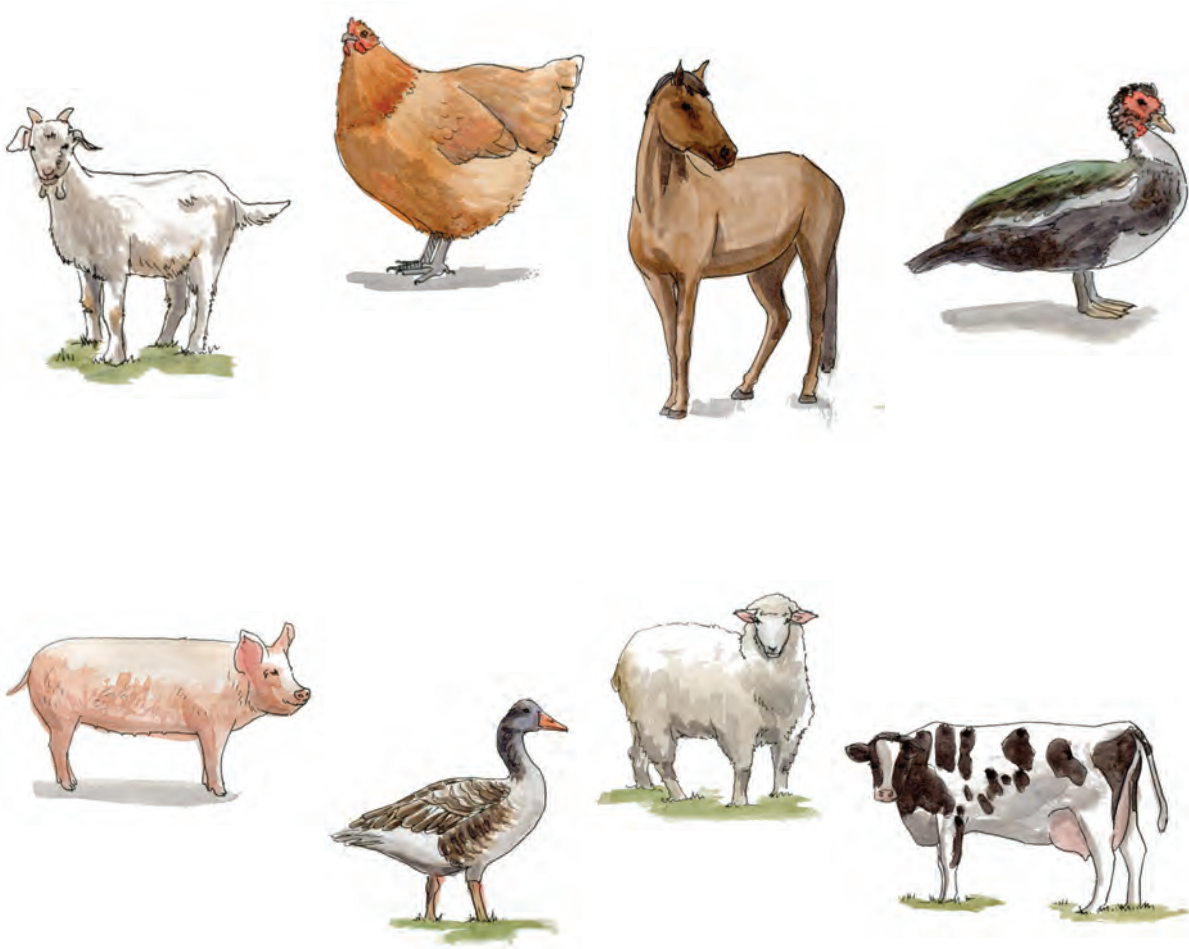
What animal is that? bingo

Directions

Students should be provided with different bingo sheets (p. 89–91). Each bingo sheet contains common products from animals. Many of these products come from many different animals, so students will have different ways to play with their bingo cards.

The animal list (p. 85) should be cut up and placed in a container to be drawn out like bingo numbers. As animals are drawn, students should assess their bingo card and write the name of the animal into the square that shows the product that animal makes. For example, a student could write 'chicken' into the square that says 'eggs'. In some instances, there may be many different products that the animal could fit into. Students can only use the animal for one square, so should choose wisely to increase their chances of completing their bingo sheet.

When a student has completed their bingo sheet and called 'Bingo!', they must show the class that their answers are correct.



Activity

What animal is that? bingo cards

Eggs 	Meat 	Hair 
Wax 	Wool 	Feathers 
Honey 	Milk 	Manure 

Activity

Feathers



Meat



Hair



Wax



Honey



Manure



Wool



Milk



Eggs



Activity

Wool 	Meat 	Hair 
Manure 	Eggs 	Feathers 
Honey 	Milk 	Wax 

Adaptations

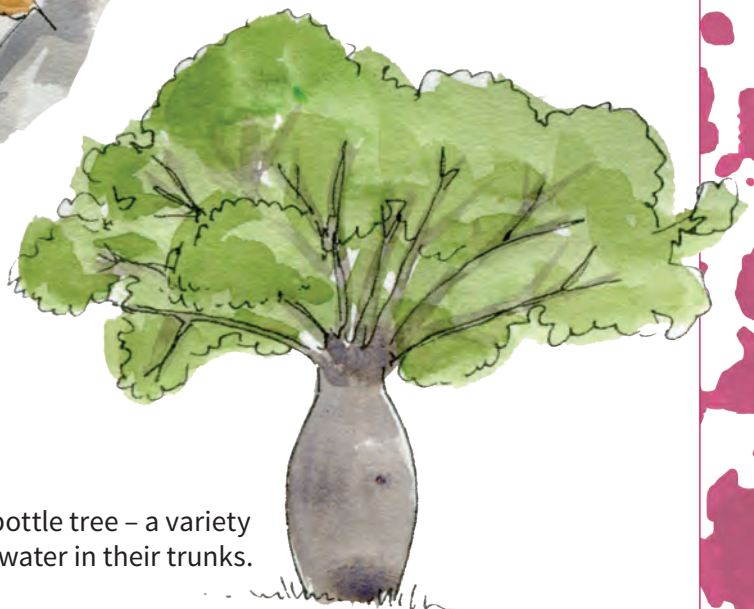
Adaptations are features that help organisms survive in their environment. They can be features about the size and shape of the plant or animal or the behaviour that helps them catch food, keep out of the hot sun or survive in freezing conditions. Here are some examples:



Birds and bats have a similar pattern of bones to enable them to fly.



Bears hibernate (deep sleep) to escape extreme cold in winter.



Some trees, like this bottle tree – a variety of kurrajong – store water in their trunks.

Activity



Here is a microscopic view of a leaf. The leaf openings, shown as doughnut shapes, can close in the heat of the day. Tiny hairs also keep the plant cool and protect it from harsh conditions.



Seed pods protect the developing seeds so that they can mature before being released.



Tendrils are long threads that twine around objects to enable some plants to climb upwards and support themselves.

Humans have adaptations too. What features do we have that help us live?

Activity

Visit the plants that are growing in the school garden. Observe their features and discuss some of their characteristics below.

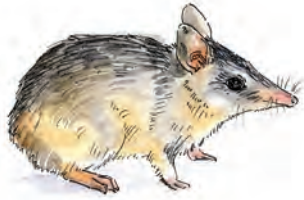
Plant name	Special features

Choose a common house (domestic) pet. What features does this animal have?

Activity

Adaptations in garden animals

Many animals that visit our gardens have features that provide ways for them to better survive in their environment. Write down what beneficial features these animals have under each picture. Not all of these animals may be found in your area, so you may need to do some research.



Bandicoot



Pygmy possum



Chuditch



Bee



Ant



Wasp

Activity



Boobook owl



New Holland honeyeater



Magpie



Frog



Lizard



Snail



Centipede



Earthworm



Spider

Activity



Butterfly



Caterpillar



Dragonfly



Slater



Grasshopper

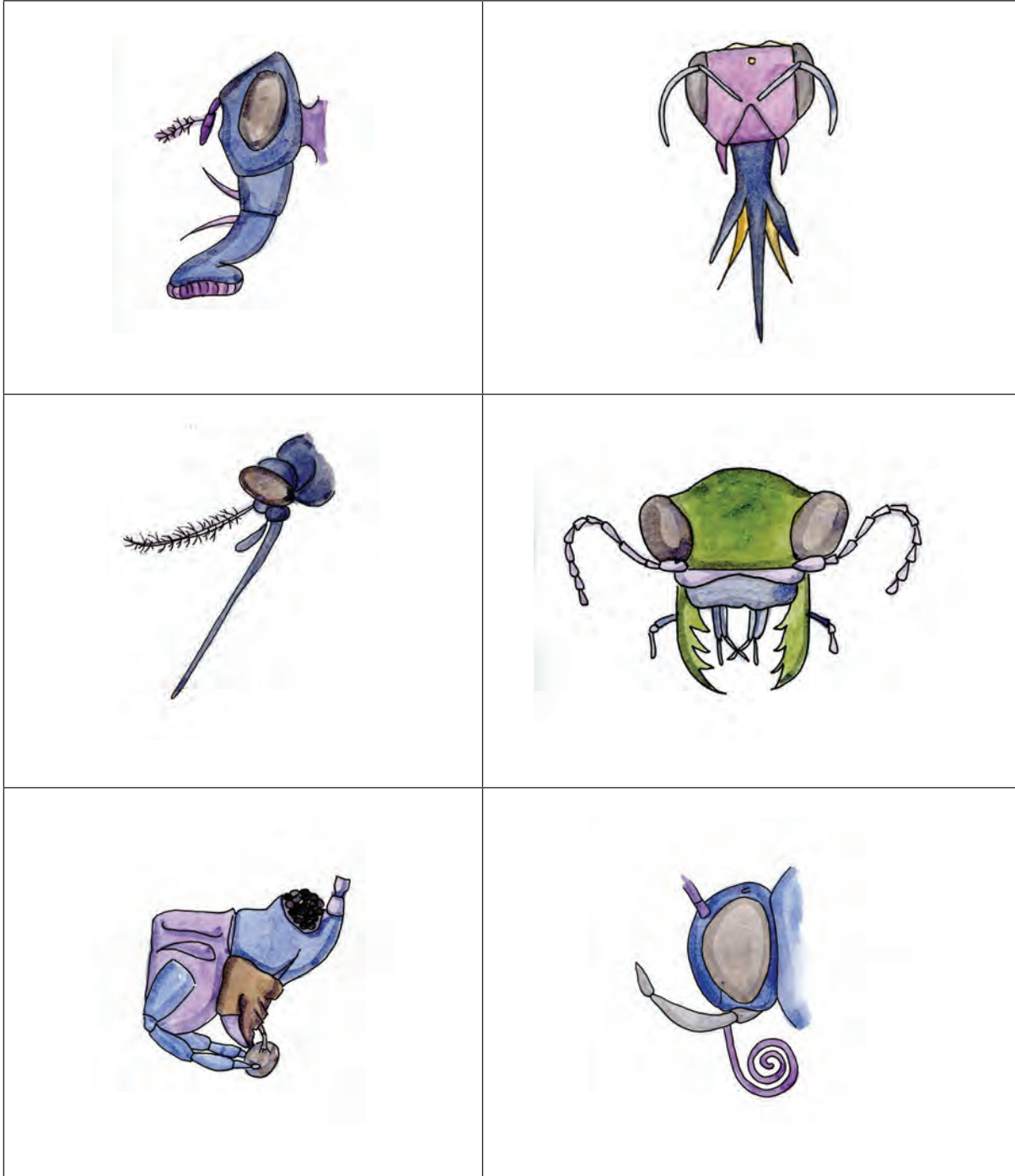


Bobtail lizard

Activity

How do these insects feed?

Examine the insect head diagrams below and indicate whether they feed by biting and chewing; siphoning; chewing and lapping; piercing and sucking; sponging; or rasping and sucking.



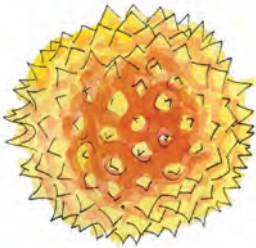
Activity

Pollination

1. What is meant by *pollination*?

2. Examine these microscopic images of pollen grains and decide whether you think they are wind pollinated or animal pollinated. Place each letter labelling the pollen grain in the appropriate column.

Wind pollinated	Animal pollinated



A



B



C



D



E



F



G



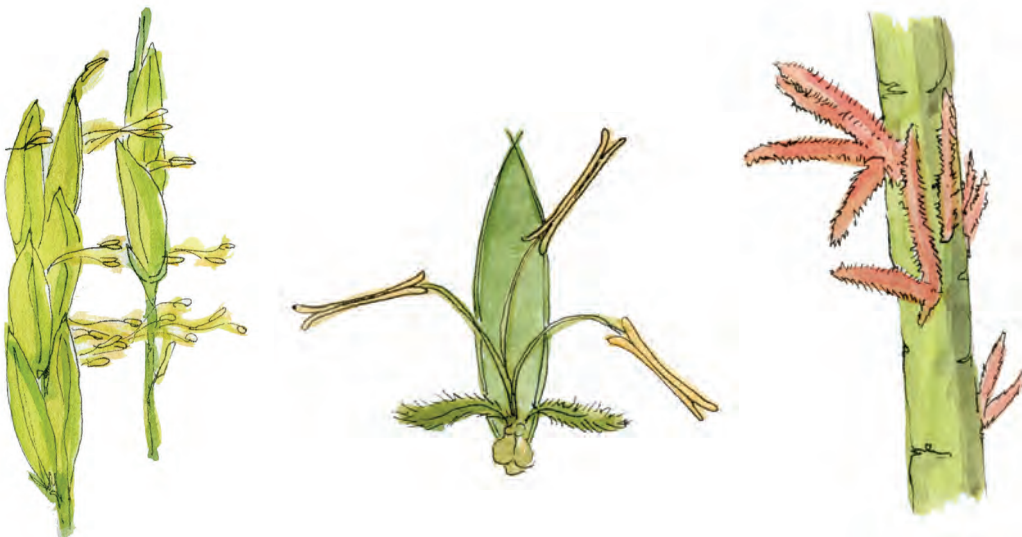
H

Activity

3. Explain the reasoning behind your choices in question 2.

4. Find and examine photographs of animals visiting flowers. What adaptations do these flowers have to attract pollinators such as bees, birds, small mammals and butterflies?

5. Wind-pollinated flowers have different adaptations. What observations can you make about plants that use wind to transfer pollen?



Examples of wind pollinated plants

Activity

Adaptations in bees

Introduce students to adaptations in bees through the background information provided on page 108. This should give students the foundational information about adaptations in bees that will allow them to answer the questions in this activity.

This is a four corners activity. For this activity we suggest having corners labelled *protection*, *collecting pollen*, *storing pollen* and *collecting nectar and propolis*. You can then ask students questions that allow them to identify which of these roles certain adaptations serve. For example, what is the main benefit of the black and yellow colour of bees? Students will go to the corner that represents their answer.

If students go to a variety of different corners, ask them to discuss with their group why they think they are in the right corner. Then have the groups explain their discussion to the class. This could show that there is more than one right answer, or some students may change their minds and switch corners.

Extension

Students can research how bees make wax and how it is used to make honeycomb, and the role of propolis in the hive.



Activity

Australian native bees

Bees collect pollen from flowers, which they use as food. If you have read about bees, you will know there are plenty of ways that a bee's body helps them to collect and transport this pollen. In this activity, you will research Australian native bees and their adaptations. You may wish to research bees you have seen in your school garden.

To encourage native bees in your school grounds, you can make a bee hotel, and this is described in *Life in a garden* (p. 63).



A native bee entering its nest hole

Research the special adaptations of Australian native bees and record what you learn.

On a blank sheet of paper or on the back of this activity sheet, draw some of the Australian native bees you could expect to find in your area.

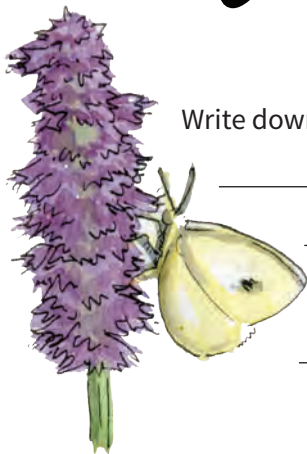
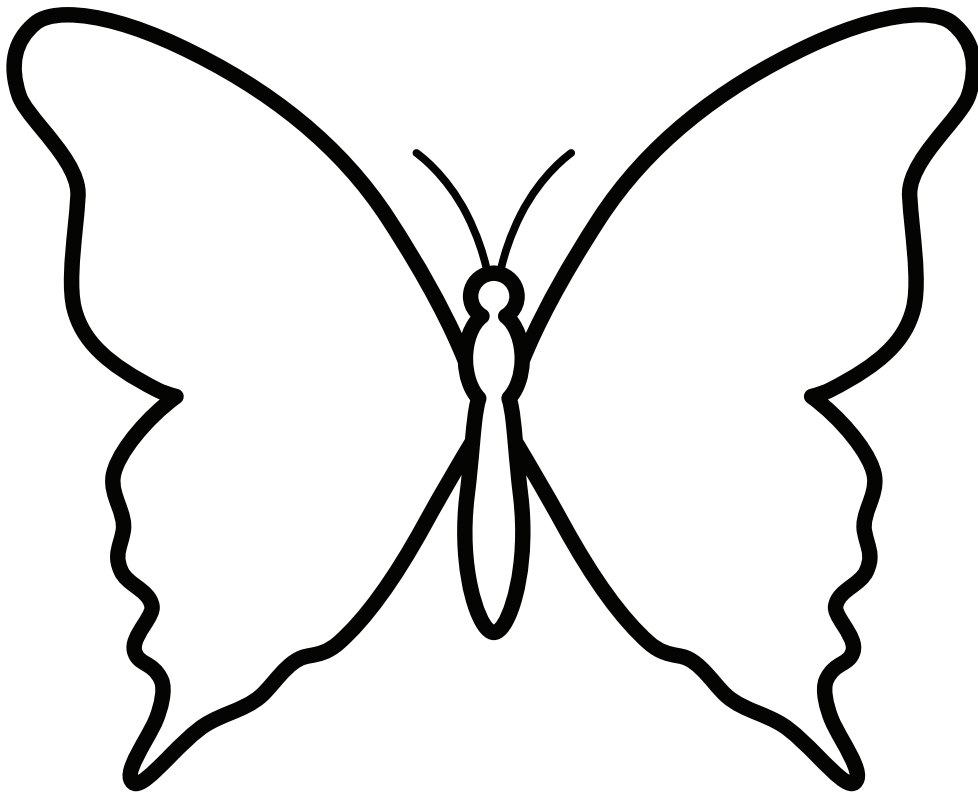
Activity

Butterflies

Butterflies have a long narrow tube in their mouth, called a *proboscis*, that acts as a straw. They usually sit on top of a flower and drink the nectar. Nectar is a sugary solution, and this provides nourishment. Find out about butterflies and some of their features and describe these below.

Find out about some of the features of butterflies and how they differ from other insects.

Go out into your garden and see if you can find some butterflies. Colour in the template below based on your observations of butterflies in your garden.



Write down some of your observations about butterflies you find in the garden.

Activity

Adaptations in birds

Examine each of the beaks of these common birds and make suggestions about what kinds of foods they might eat. Complete the table provided with your observations and thoughts.



Twenty-eight parrot



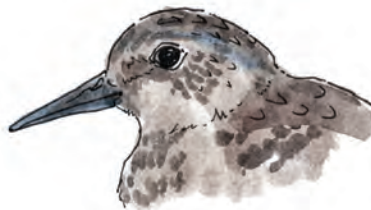
Chicken



Black honeyeater



Spoonbill



Sandpiper



Willy wagtail



Brown falcon



Goose



Red-browed finch

Activity

Bird	Features of beak	Kinds of foods they might eat
Twenty-eight parrot		
Chicken		
Black honeyeater		
Spoonbill		
Sandpiper		
Willy wagtail		
Brown falcon		
Goose		
Red-browed finch		

Extension

- Using the internet or books from the library, learn about the feet of birds. Assemble pictures or create some drawings of the different types of feet and write about what their feet are adapted for.
- Examine the adaptations and features of birds in more detail. Research what characteristics they have that enable them to fly or grab fish from the ocean or run like an emu.



Activity

Adaptations in common garden animal pests

You are to observe a few common garden pests, such as snails, slugs, caterpillars or slaters. Examine these to determine their special features that enable them to survive in their environment. Make some sketches and notes in the spaces provided.

Animal: _____

Adaptations





Animal: _____

Adaptations

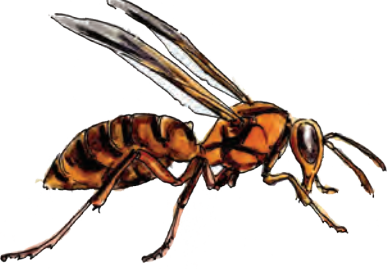


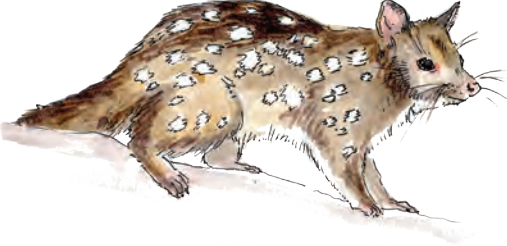
Activity

Predators in the garden

Research how these organisms are used in pest control in the garden. Explain in one or two sentences in the space provided.

Organism	How it is involved in pest control
Frog 	
Lizard 	
Ladybird 	
Spider 	

Activity

Organism	How it is involved in pest control
<p data-bbox="230 362 298 394">Wasp</p> 	
<p data-bbox="230 746 285 778">Bird</p> 	
<p data-bbox="230 1129 597 1161">Bird of prey (owl, hawk, eagle)</p> 	
<p data-bbox="230 1515 690 1584">Marsupial carnivores (chuditch, quoll, Tasmanian devil)</p> 	

Activity

Your garden ecosystem

Part 1

Have students observe animals and insects in the garden, noting down what each animal does, how it interacts with others and what role that animal may play in the garden. Each student should be encouraged to observe a different animal or species, if possible, to gather information on a variety of creatures in the garden ecosystem.

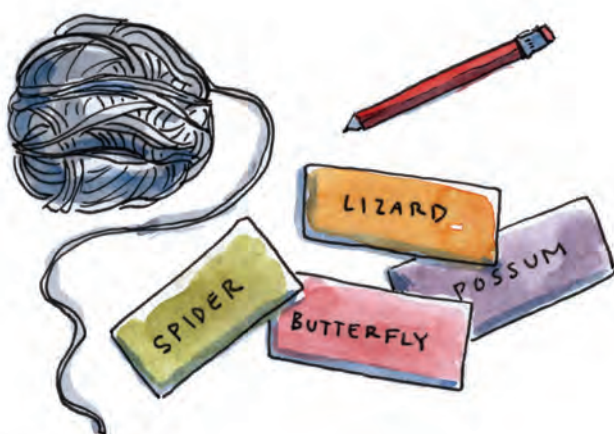
Alternatively, you may assign a common garden animal or insect to students and have them research their assigned animal. To complete the second part of the activity students will need to understand how their animal or insect engages with others in the garden ecosystem.



Part 2

For this part of the activity you will need a ball of string long enough to be passed around the group and name tags to identify the different animals that each student will represent.

Once the observation or research phase is complete, have students stand in a circle. They should each wear the label of the animal that they have observed or researched. You should also have an animal name tag and start with the ball of string. Holding onto the loose end of the string, throw the ball to a student and explain how your animal interacts with the student's animal. That student then continues the process by doing the same and passing the ball along to someone else. The ball of string should be passed around until every student has been included in the garden ecosystem.



Activity



Extension

Once all students have been included in the ecosystem, you may wish to turn the game into a wider discussion. You may wish to pose questions that explore how changes in balance or habitat may affect the ecosystem as a whole. You may wish to have students step outside the circle to show the gaps if one species is threatened or removed from the ecosystem.

This activity could also be completed with a variety of other habitats and ecosystems to show that all ecosystems rely on every creature, big or small.



Activity

Soil critters

In leaf litter and the first few centimetres of soil, you can usually find large numbers of animals and organisms, including earthworms, insects and mites, nematodes, fungi, bacteria, land crustaceans and single-celled protozoa. These feed on the organic matter present and on each other.

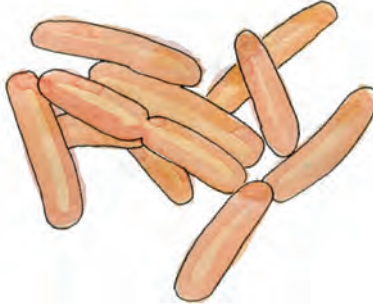
Microscopic life

Most of the organisms that live in soil are only visible through a powerful microscope. These include bacteria and single-celled algae. Bacteria, like fungi, are decomposers, and they cannot make food themselves and must feed on other organisms or organic material. Decomposers break down dead organisms (both plants and animals) into simpler substances that can ultimately be made into complex substances and used by another organism to survive.

Organisms larger than bacteria are called *microfauna*, and this includes single-celled organisms, such as protozoa, and simple organisms, such as rotifers and minute flatworms. All of these move about the soil and feed on other microscopic life.



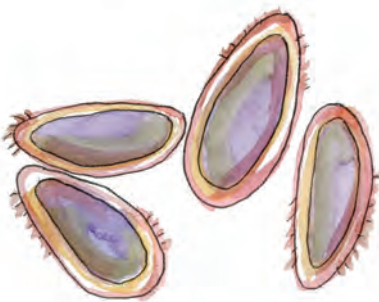
Single bacteria cell (such as *Escherichia coli*)



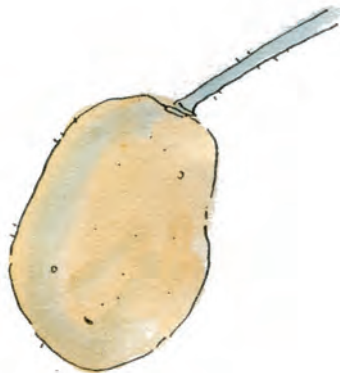
A colony of *Bacillus* bacteria



Fungi (toadstools)



Protozoa (e.g. paramecium)



A protozoan (such as a rotifer) showing part of its flagellum



Mycorrhizal fungi

Activity

Macroscopic life

These organisms may be small, but they can be seen with your eyes. The smaller organisms in this group are the *mesofauna*, and these include nematodes, mites and springtails.

Macrofauna are even larger again, common examples being ants, termites, slugs and snails, millipedes and centipedes, insect larvae, and various beetles. These feed on decaying matter, other organisms and plants.

Finally, the largest soil organisms are called *megafauna*, and these include earthworms, burrowing animals and fungi.

Fungi tend to be large and visible to the naked eye, such as mushrooms and toadstools, but some have microscopic threads, such as the mycorrhizal fungi, which help plants obtain water and nutrients in exchange for food.



Mite



Ant



Springtail



Termite



Nematode



Earthworm

Activity

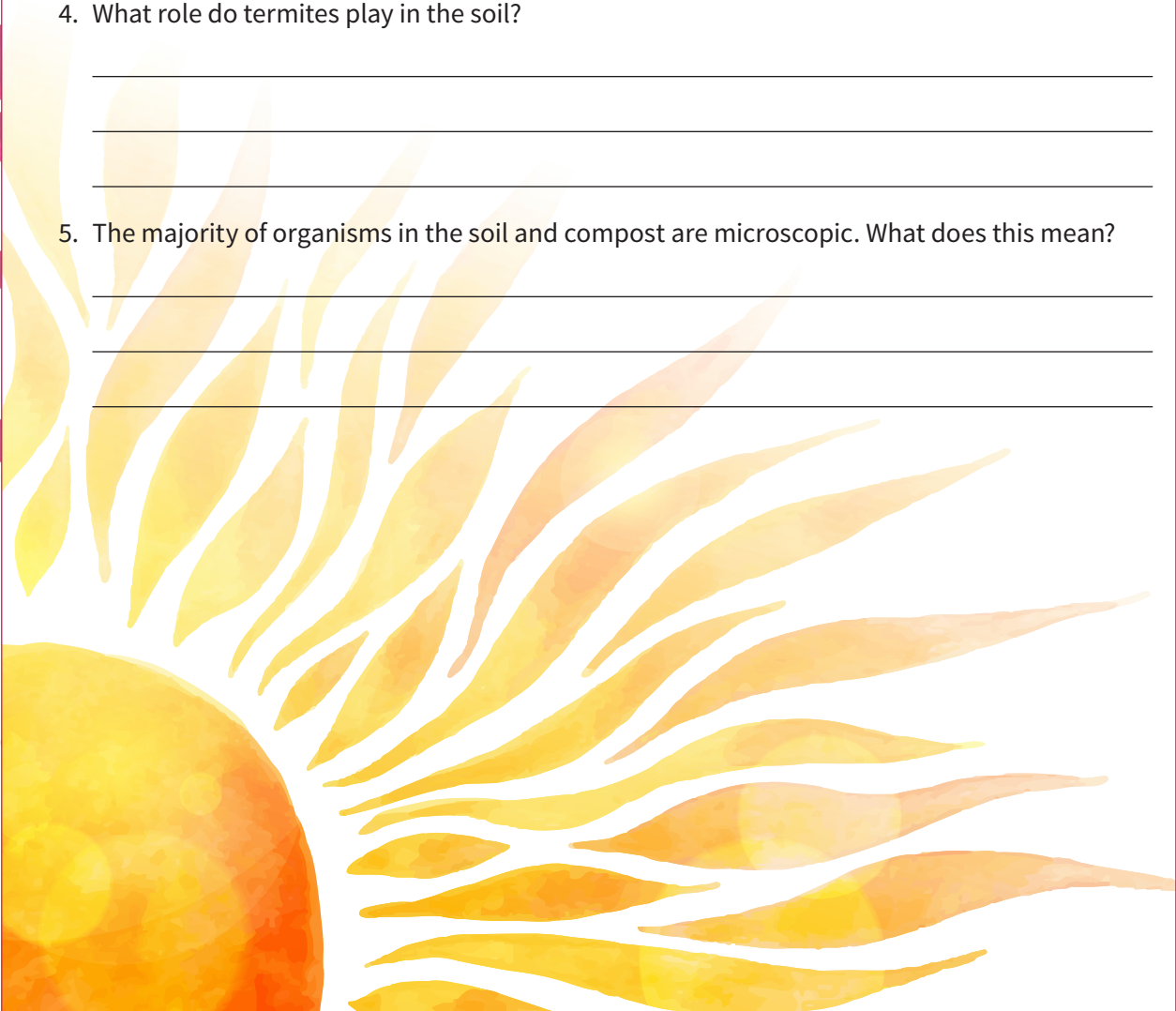
1. Which organisms are decomposers?

2. Which organisms are producers in most environments?

3. What is the original source of energy for producers?

4. What role do termites play in the soil?

5. The majority of organisms in the soil and compost are microscopic. What does this mean?



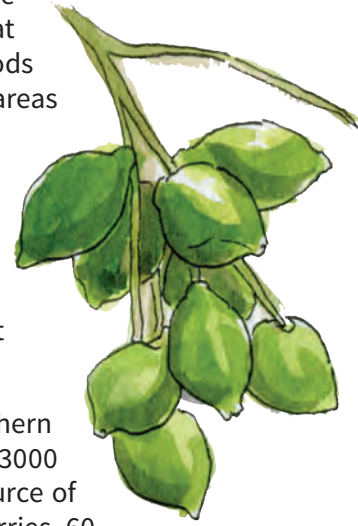
Activity

Nutritional value of bush foods

Australian bush foods have been found to be very nutritious. While many of these are edible, only a few are palatable. This means that the majority of bush foods don't taste that nice. Even so, plant foods have historically composed up to 80 per cent of the diet in desert areas and up to 40 per cent in coastal areas.

Bush tucker is generally low in energy density but high in nutrient density, being high in protein, low in sugars, high in fibre and high in micronutrients. The carbohydrates have a low glycaemic index value, producing lower glucose and insulin levels than similar Western foods. Their consumption may be protective against diabetes.

As one example, research has found that the green plum in northern Australia (Kakadu plum – *Terminalia ferdinandiana*) contains about 3000 milligrams (per 100 grams) of vitamin C – making it the richest source of vitamin C in the world. This is 30 times more vitamin C than goji berries, 60 times that of oranges and over 300 times that of blueberries.



Kakadu plum

Directions

Examine the tables that follow and answer the questions in the spaces provided.

Table 1: Nutrient content of bush foods compared to the common tomato and fig

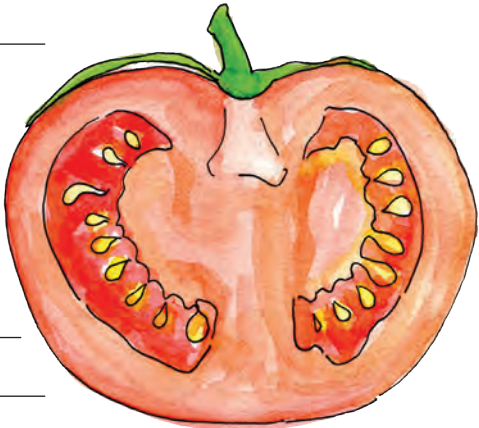
Plant	Energy (kJ)	Protein (g)	Fat (g)	Carbohydrates (g)	Thiamine (mg)	Vitamin C (mg)
Fig (common)	311	1	0	19	0.01	2
Sandpaper fig	548	4	0.8	29	0.13	234
Desert fig	569	3	2.1	36	0.1	2
Tomato	76	1	0	4	0.1	19
Bush raisin	570	3.8	0.6	32	0.21	19

Note: Values listed per 100 grams of food.

1. What general comments can you make when the nutrient content of common figs is compared to sandpaper and desert figs?

Activity

2. What general comments can you make when the nutrient content of the common tomato is compared to the desert tomato – the bush raisin?



Common tomato

3. Comparing the sandpaper fig with the Kakadu plum, approximately how much more vitamin C is found in the Kakadu plum? Use the space below to show your calculations.

Table 2: Nutrient and mineral content of bush foods compared to the common plum, almond and pecan nut

Plant	Energy (kJ)	Protein (g)	Fat (g)	Carbohydrate (g)	Vitamin C (mg)	Iron (mg)	Magnesium (mg)	Calcium (mg)
Plum	193	1	0	10	9.5	0.35	12	10
Quandong	335	2.3	0.2	21	ND	0.5	34	53
Sandalwood	636	3.3	4.4	26	15	1.9	55	41
Almond	2286	21	30	21	0	3.5	255	251
Pecan	2900	9	72	14	1.1	2.5	121	70
Macadamia	3015	8	76	14	1.2	3.7	130	85

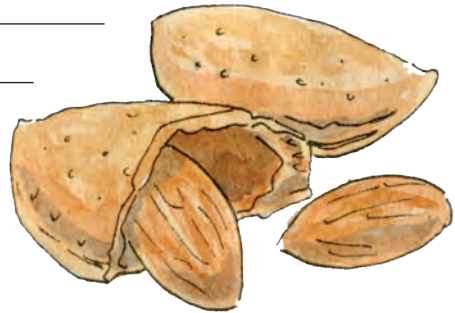
Note: Values listed per 100 grams of food.

4. Of plum, quandong and sandalwood, which do you think has the overall highest nutrient value? Explain your answer.

Activity

5. Compare the data for pecans and macadamias. Pecan nut trees originate from North America while macadamia nut trees were originally found in northern New South Wales and Queensland. Which nut do you think has the highest nutrient value? Explain your answer.

6. Examine Tables 1 and 2 and compare all fruits and nuts listed. Why do you think nuts, generally, have higher energy and nutrient content (such as protein, fats and some minerals) than fleshy fruits?



Almonds

7. What role does each of the following play in plant structure and function? You will have to undertake some research to find out about these substances.

- (a) Protein _____

- (b) Fat _____

- (c) Carbohydrates _____

Extension

Learn about the nutritional value of peanuts.



Peanuts

Activity

First Australians and the environment

You are to research how First Australians have traditionally used plants and animals and interacted with all aspects of their environment. You may wish to research the First Australians peoples of your local area and focus on their culture.

How have First Australians traditionally used these materials in their environment?

Plants	Animals
Fire	Soil and rocks
Water	Ores and minerals

How have First Australians traditionally responded to different habitats and seasons?

Desert areas	Coastal areas
Changes in the seasonal climate	Types of tools used

Activity

Minimising waste in the garden

Whenever we plant and work in the garden, we produce waste. This may include branches and plant material after pruning, plastic flower pots and punnets after planting, dead or diseased plants that have been removed from the garden, and plant labels, ties and small stakes that are leftover once shrubs and trees have been planted. There are many options to deal with waste or the potential to generate waste: we could reduce, recycle, re-use, rot and refuse.

Discuss with your group what you could do to minimise waste and record some ideas in the following spaces.

Reducing _____

Recycling _____

Re-using _____

Rotting _____

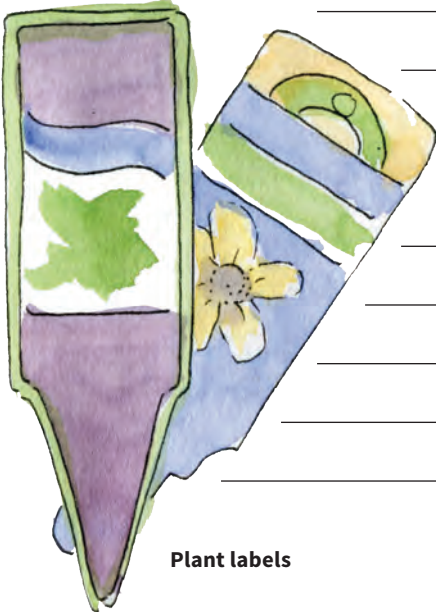
Refusing _____



Activity

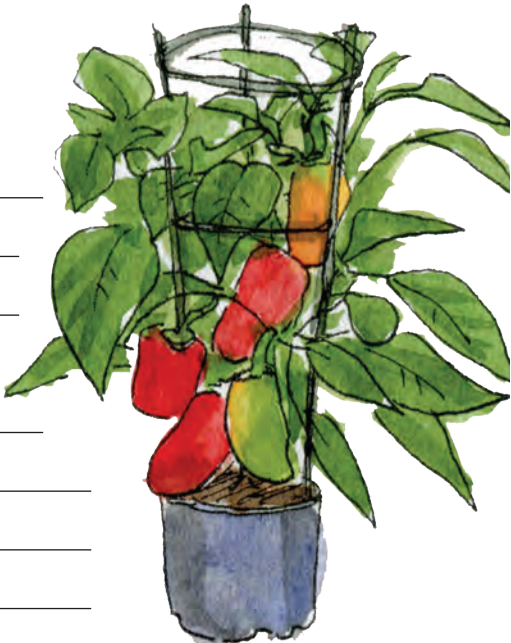
Can your group think of other uses for used flower pots or seedling punnets? Write some of your suggestions here.

How can these materials be re-used or recycled?



Plant labels

Plastic garden stakes and trellis frames



Activity

Waste audit evaluation

In this activity you will evaluate your findings from the waste audit and come up with suggestions for how to address these observations. This will be specific to your school and allow you to personalise the waste management of your school.

What are the items that are most common in your waste audit? Are they products or materials?

In groups, brainstorm ways that these common items can be reduced or re-used in your school and garden community. Record your ideas here.

Look at the bottom of any plastic items. You should see a small triangle with a number inside. Find out more about these recycling codes, including the common products for each type of plastic and whether they can be recycled. Note down what you learn in the following table.

Plastic number	Type of plastic	Common uses or products	Can it be recycled? Where?

Activity

Using food from the garden

Using the food we grow is one of the pleasures of life. Provided we grow it organically, it is generally safe to eat. However, there will always be a few pests eating leaves or fruit and the occasional disease that infects the plant. This is why we must always practise good hygiene and safe handling procedures.

1. What is meant by *hygiene*?

2. List a few examples of things you can do to maintain good hygiene.

3. Explain, with a couple of examples, what safe handling procedures are.

Once our produce is picked, we can take it to the kitchen. Often, we need to store the produce for some time before we use it.

4. How can we prepare and store our food if we cannot use it straight away?

5. Imagine all the different types of food and produce we can harvest from the garden. List some of the ways we can use this produce.

Extension

Find out about these techniques that are commonly used to reduce waste when we have excess produce. Write one or two sentences about each.

Preserving

Bottling

Canning

Drying

Fermenting

Activity

Types of vegetables

Look at the pictures of common vegetables. Place the correct name from the list provided under each vegetable. Identify the part of the plant that the vegetable comes from. Colour in your vegetables.

Vegetables: *Carrot, spinach, asparagus, potato, artichoke, capsicum, lettuce, beetroot, cauliflower, broccoli, onion, peas.*

Plant parts: *Flower, bulb, stem, fruit, stalk, root, tuber, seed and pod, leaves*



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



Vegetable: _____

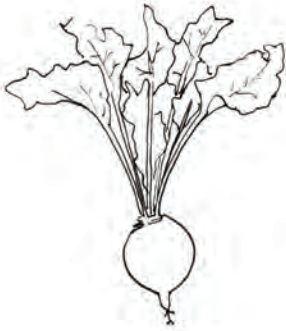
Plant part: _____



Vegetable: _____

Plant part: _____

Activity



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



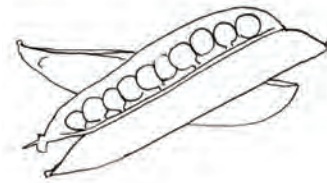
Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____



Vegetable: _____

Plant part: _____

Extension

Cut a cross-section of the vegetables discussed above (or other seasonal vegetables that you have access to) to examine them. Attempt to identify what the vegetable is before working through and labelling them.

You might discuss the vegetables and how they have grown. Does the outside look similar or different to the inside? How might the insides have affected the shape, colour or size of the vegetable? Do they appear to have a high water content, or are they quite starchy?

You may also observe differences and similarities between the cross-sections. What might these tell us about certain vegetables?

Activity

Construct a food pyramid

There are many different types of food, each with its own unique nutritional make up. The foods we grow in our gardens, our fruits and vegetables, are very good for us and give us the nutrients we need to function well. However, not all food is grown in the garden, and there are some types of food that we might want to enjoy less frequently as part of a balanced diet.

Guidance for how much of each type of food we should eat is often presented in a food pyramid but may be presented in another shape or form. Conduct an internet search to find as many different food pyramids or nutritional guidance images as you can. How are they similar? How are they different?

Based on what you learn about food pyramids and nutritional advice, cut out the pictures below of the common foods, from both the garden and the supermarket or restaurant, and make up your own food pyramid on a large sheet of paper.



Soft drink



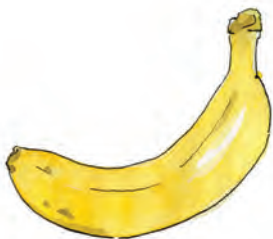
Broccoli



Hot chips



Peas



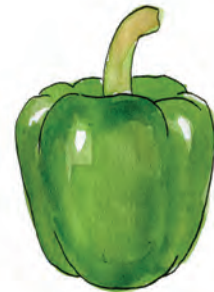
Banana



Strawberry



Fish



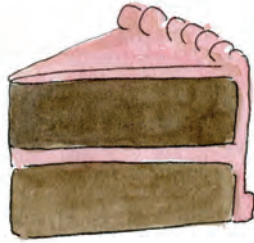
Capsicum



Activity



Cheese



Cake



Cherries



Wheat



Pumpkin



Potato



Eggs



Grapes

Extension

Vitamins and minerals investigation

Go into the garden and observe the foods you are growing. Research the vitamins and minerals common in these garden foods and compare them to one other. You might like to start a discussion with your group about healthy eating, vitamins, minerals and health benefits of the specific foods in the student garden.

Food groups

If the garden has a wide range of foods, you can observe the foods in the garden and then categorise them further into vegetable classifications or food pyramid classifications. Again, this focuses on the health benefits of food and a healthy diet while including the skills of observing and classifying.

