

Greening and Growing Together: Secondary School

The connection between Australia's land and peoples has a long history. Let's explore traditional uses of plants, how fire shapes landscapes and the benefits of bush bathing.

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People

What do you know about Bush Tucker?
What is Bush Tucker?



Investigate

What do you know about Bush Tucker already? View images of **Bush Tucker Plants** commonly found in schools in the activity sheet.

Choose a native plant that resides within the school. How was it used traditionally? As a tool, weapon, food or medicine? Watch the video here:



See the activity sheet for how **Tapping Sticks** are made from red bottlebrush.

Plan

Select an area of the school to create a cultural learning space that doubles as a bush tucker garden.

Sketch a design of the existing garden area and what is currently growing in it. What additional plants and other elements can be added to this space? View examples of a **Cultural Learning Space**, including a yarning circle, in the activity sheet.

Take action

Turn your design into a reality!
Create your **Cultural Learning Space** within the school. The space should have plants that demonstrate plant use for medicine, food, tools and weapons, shelter and fibre.

Are any of your plant/s edible?
And how can you use them in your bush tucker garden? [Find out here.](#)

Monitor

Is your garden a home or resting place for animals? Does it attract bees, birds or any other pollinators? What is living or resting in your trees? Create your own Aboriginal drawing showing how insects and other animals connect with your garden.

Celebrate

Create and share an **Artwork Celebrating Native Plants** - see examples in the activity sheet.

Make a school short film recording what Country you are on, the local names for plant/s you have researched and how they are used.

Do some cooking with your bush tucker: [Lemon Myrtle Bush Bickies](#) and [Edible Native Plants](#).



Bush Tucker Plants



Bush Tucker, also known as bush food, provides Australia's First Nations peoples with a seasonal, reliable food source that contributes to a healthy diet.

Evidence suggests Aboriginal people have cultivated and domesticated crops native to this continent for many tens of thousands of years.

Warning: strict care must be taken when eating any plant material that is unfamiliar.



Warrigal Greens (*Tetragonia tetragonioides*) found along the coast have a taste similar to mild spinach. Leaves should typically be blanched or steamed before eating as they contain toxic oxates.



Banksia flowers produce some of the sweetest nectar. The nectar from other native plants such as Callistemon and Grevillea are also consumed and can be diluted with water for a tasty drink.



Wattle uses vary, depending on the species. With some species the green seeds can be eaten raw and the dry seeds ground into flour to make a type of bread. Some gum can be eaten when fresh and used as an adhesive. The strong wood of the tree is also used in weapon making.



The fruits from a variety of Lilly Pilly can be eaten and they make delicious jams, cordials and jellies.



Davidson Plums (*Davidsonia*) contain high levels of antioxidants and vitamins. They have a strong tart flavour and can be eaten raw or dried and added to recipes.



Lerp is the protective, structured cover produced by larvae of psyllid bugs and collects on the surface of eucalyptus leaves. It is sweet to taste and can be eaten directly or dissolved in water.



The roots of native indigo (*Indigofera australis*) can be used as 'fish poison', by depleting the water of oxygen to stun the fish before catching them. The leaves also produce a yellow dye when crushed.



Wombat berry (*Eustrephus latifolius*) fruits can be eaten when ripe as well as the small tubers in the root system. The tubers can be eaten either raw or cooked and have an earthy flavour.



Geebung (*Persoonia lanceolata*) produces a sweet, chewy fleshy fruit that is edible when ripe.



Finger Limes (*Citrus australasica*) are the fruit of a thorny shrub of the same name. Very sour to taste, but excellent as a citrus replacement.



The nuts of a variety of *Macadamia* species are a popular source of antioxidants, vitamins and minerals. They also taste great!



The young stems of the Gynea Lily (*Doryanthes excels*) can be roasted, as can the tuberous section of the roots, which can be made into a sort of cake to be eaten cold. The flower spikes can also be used as light-weight, floating spears.



The essential oils in Lemon Myrtle (*Backhousia citriodora*) contain antimicrobial compounds and are used for medicinal and therapeutic purposes. The leaves add a wonderful lemon flavour to food and drinks. They can be ground up and used dry or fresh.



Paperbark - *Melaleuca* species has medicinal properties. The oil found in the leaves can be used as an antiseptic and the bark as a bush bandage. The bark has a variety of uses including wrapping babies, fishing floats and to wrap food for cooking.



Native raspberry (*Rubus parvifolius*) fruits are similar in shape and colour to common raspberries, but have a more tart flavour. Eat them fresh (raw) or use them in cakes, jams, jellies, syrups and sauces.



Native leek (*Bulbine bulbosa*) has edible seeds, roots and corms found below ground. The corms are best roasted and are nutritious, containing calcium and iron.



Spiny-Headed Mat-Rush (*Lomandra longifolia*) can be woven into baskets, mats and eel-traps and the seeds can be ground into a flour. The tender leaf bases also have a sweet, pea-like flavour and are high in carbohydrates. The leaves are also used to make baskets, hence the name 'mat-rush'.



The fruit of Pigface (*Carpobrotus glaucescens*) is red/purple when ripe and can be eaten. The salty leaves can also be eaten with meat, both raw or cooked. The juice from the leaves has multiple uses - from soothing stings or burnt skin to an eye wash.

How to make Tapping Sticks



Bush Tucker is a word used commonly when we talk about the traditional use of native plants.

The Bottlebrush tree has been used for over thousands of years by Australia's First Nations People. Bottlebrush flowers produce some of the sweetest nectar and their branches naturally form a Wommerra. As well as this, solid Tapping Sticks can be made from a Red Bottlebrush tree branch. Follow the steps on pages 2 – 4 to make your own!



This *Callistemon viminalis* (Red Bottlebrush) tree is 4 metres high with many branches to make tapping sticks from.



This Red Bottlebrush Tree produces pollen and nectar for our bees, butterflies and birds.



Step 1

Find a branch that is approx. 7cm thick. Measure and mark 60cm length of the branch.



Step 2

Using a wood saw, cut straight through your branch at the markings.



Step 3

Peel back the bark to reveal the centre wood.



Step 4

Removing the bark gives the wood a clear sound when using the sticks.



Step 5

Measure half way, approx. 30cm, and make a mark before cutting your stick in half.



Step 6

Dry the wood for four days in cool, dry place.



Step 7

Sand back the wood, either by hand or with an electric sander. Sanding the dry inner skin off the sticks allows for a clear, crisp sound.



Step 8

Sand the ends, edges and length of the sticks by hand as splitting and cracking will occur before lacquering.

How to make Tapping Sticks



Step 9

Once you are happy with how smooth your tapping sticks are, cover with a wood lacquer of your choice. We recommend either vegetable oil or an aerosol clear wood varnish.

Cultural Learning Space



Creating cultural learning spaces within your school not only provides a valuable resource, they also allow students to contribute in a meaningful way whilst connecting to Country.



Fire Pit

Culturally, fire is an important symbol. It is used as a practical tool in hunting, cooking, warmth and managing the landscape as well as holding great spiritual meaning.



Yarning Circle

Yarning circles are a great place to come together to talk, listen and share. They are designed to allow all to have their say in a safe space without judgement.



Dance Pit

Music and dance are very important to Aboriginal culture. They are used to mark special occasions, tell stories of the Creation and Dreamtime and are used in ceremonies.



Signage

Signage throughout your cultural learning space ensures that knowledge is passed on and enhances the garden. It is important that the knowledge in your signage is correct to your local area.



Story Poles

Story poles can take people on a journey or guide them through a garden space. It is important to seek advice from local elders or community to learn what's appropriate for the space.



Murals

Murals can tell the story of the Country and of those who have been before. Murals can also draw attention to the native fauna and flora of the region and their significance.

Natural Artworks Celebrating Native Plants



Plants

Fire has long been part of the Australian landscape; sometimes used to great effect, but at other times causing devastation.



Investigate

Discussion: How has fire been used in the Australian landscape to help shape the continent? Can you see differences and similarities between cultural burns and hazard reduction burns? [Watch the three videos on this webpage.](#)

What are the differences and similarities in fire management approaches? Complete the **Venn diagram** with your thoughts.

How have plants evolved with fire? [Take a look](#) at some of the ways native plants have adapted with fire in the Australian landscape over millions of years (scroll down page to 'fire-proof award').

Plan

How does fire impact the following plants and how have they adapted to fire? See the activity sheet, **Xanthorrhoea and Fire** and **Plant Adaptions for Coping with Fire**. List adaptations of fire for Banksia, Eucalyptus, Callitris, Xanthorrhoea, and Acacia in the table provided.

View the images of Xanthorrhoea in the activity sheet, then recreate your own series of sketches to show stages of your chosen native plant before, during, directly after and after fire.

Take action

Compare how fire can impact seed germination by completing the **Science Experiment** activity sheet. Alternatively, devise your own experiment to learn more about how fire impacts plant growth.

Monitor

Write up a scientific report of your findings. How do your findings compare with popular opinion or previous scientific studies?

Celebrate

Throughout the school, create a trail of knowledge for others to learn from, whilst celebrating the knowledge that you have acquired.

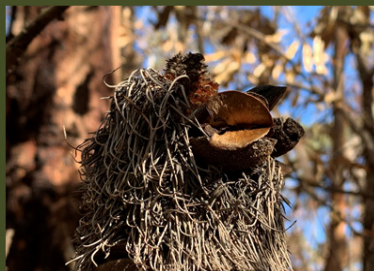
Design and install signage with information about plants and their relationship with fire – germination, dispersal, cycles etc.

View the example here, then devise your own.

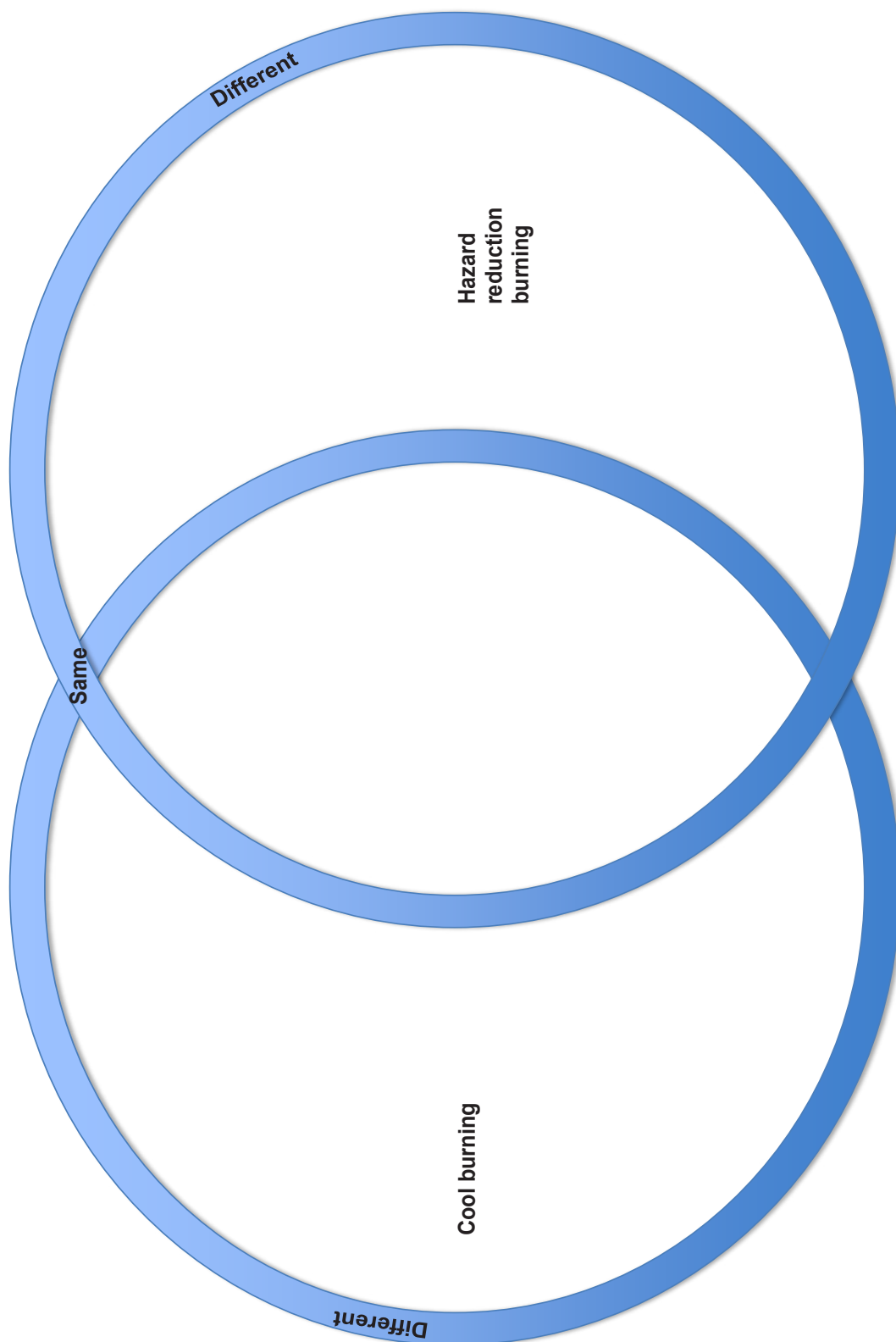


Old Man Banksia
Banksia serrata

- *Banksia serrata* has wrinkled grey bark, dark green serrated leaves on top and light below and large flower spikes appearing over summer.
- They will typically survive bushfires because they have very thick bark that protects the trunk from less intense fires.
- Fire also triggers the release of seeds stored in the aerial seed bank — an adaptation known as serotiny.



The similarities and differences between cool burning and hazard reduction methods.
 Write/draw the similarities in the middle section. Then, write/draw the differences in each side section. Compare your answers to the teacher's copy.

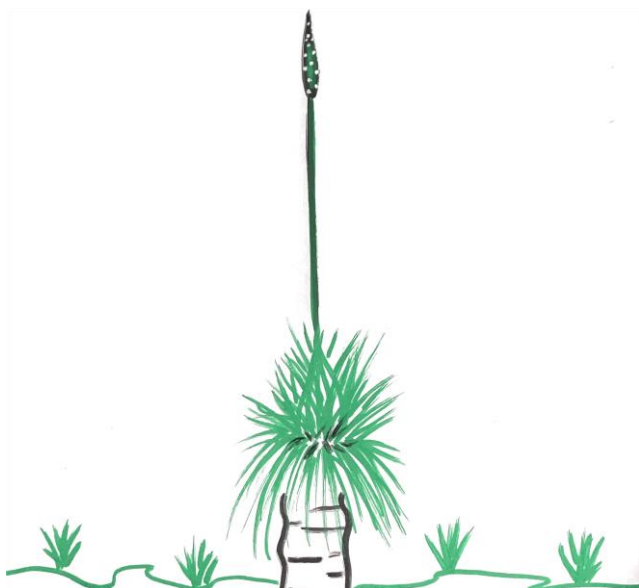


Xanthorrhoea and Fire



Look at the images below to understand how the grass tree (Xanthorrhoea) survives through fire and recovers afterward. Then, recreate your own series of sketches using your chosen native plant e.g. Banksia, Eucalyptus, Callitris, Acacia.

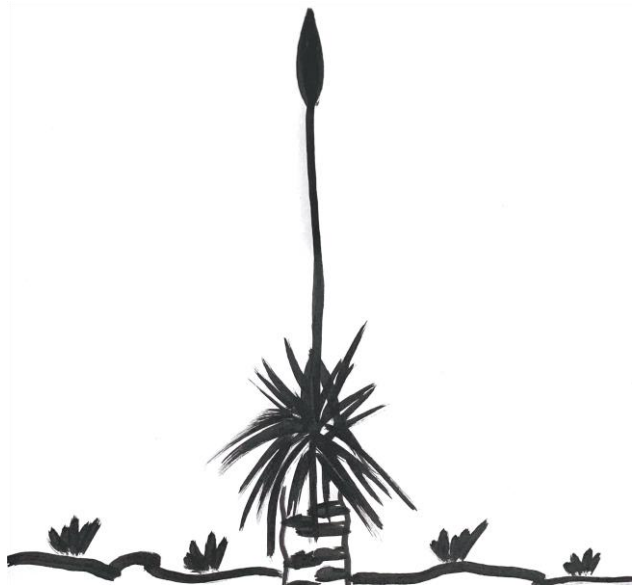
Images and text: Brenden Moore



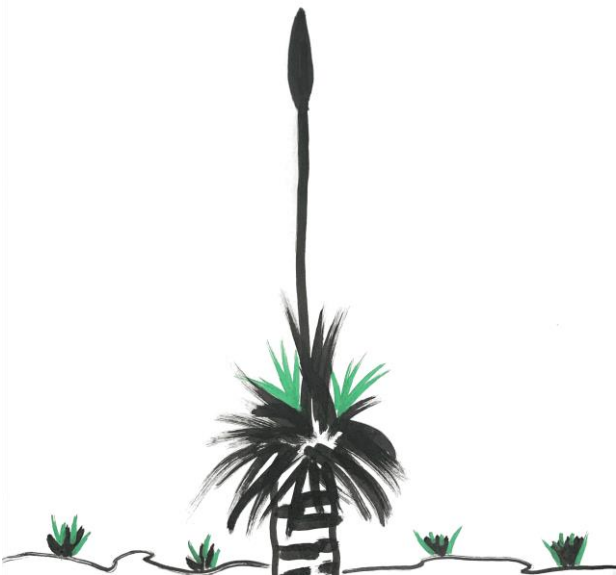
Grass Tree in its growth stage, producing green leaves and flowering in season.



Grass Tree during natural fire, burning the ground, grass and all parts of the Grass Tree.



Two weeks after the fire, landscape is completely burnt with plants still intact. Ash from the fire adds nutrients such as potassium to the soil.



Three months after the fire, new growth is seen on the Grass Tree and the surrounding vegetation has started to reshoot.



After 8-12 months, plants have taken in the nutrients and responded well to the heat, fire and ash from the fire.

Plant Adaptations for Coping with Fire



Fire has been a contributing factor to the shaping of the Australian landscape for millions of years. As a result, plants that have adapted and evolved with fire, now dominate the landscape.

Materials

- A copy of page 2 for each group.
- Pen/pencil.

Task

Work in groups to research common genera found in Australia and list some of their adaptations to fire and the impacts that fire has on them.

Top tip: rather than finding the information on one website, conduct a thorough search by typing the genus name of the plant into a search engine.

Plant Genus (Make sure you search with the exact name)	Adaptations the plant uses to survive fire
 Eucalyptus	• Hard woody capsules protect seeds from fire. • Thick bark will protect the trunk •
 Banksia	
 Acacia	
 Xanthorrhoea	
 Callitris	

Science Experiment:

Effects of Bush Fire on Native Plant Germination



Discover how heat and smoke effect the germination of Australian native plant seeds.

Equipment per group of students

- 20 - 30 Acacia seeds.
- Boiling water.
- A heatproof container e.g. a mug.
- Burnt material e.g. native leaves & twigs.
- Absorbent paper x 3 sheets.
- Pots or trays to plant seeds into.
- Seed raising mix.

Variations

Variations on this experiment include comparing how seeds germinate in:

- Seed raising mix.
- School garden soil, or
- Soil with high ash content.

Procedure

1. Setting Up

Divide the seeds into three equal piles – one pile will be ‘burnt’ (treated with boiling water), one will be ‘smoked’ (treated with smoky water) and the other pile will be ‘untreated’ – see table on page 2.

Burning	Smoking	Untreated
Place the first pile of seeds (burnt) in a cup and pour boiling water over them. (This will simulate heat from fire that passes over seeds already released in or on the ground). Leave the seeds in the water for 10 minutes then remove and allow them to dry thoroughly spread on a sheet of absorbent paper.	Carefully burn some small twigs and dry leaves and mix the resulting ash in cold water. Soak the second pile of seeds in this smoky water for 10 minutes and allow them to dry thoroughly spread on a sheet of absorbent paper.	Place the third pile of seeds in a cup and pour cold water over them. Leave them for 10 minutes then take them out and allow them to dry thoroughly spread on a sheet of absorbent paper.

2. Planting

- Label the pots or trays 'burnt', 'smoked' and 'untreated'.
- Fill each container with the same amount and type of seed raising mix – fill nearly to the top.
- Plant the 'burnt' seeds 5mm deep in the pots/trays labelled 'BURNT'.
- Plant the 'smoke' seeds 5mm deep in the containers labelled 'SMOKED'.
- Plant the 'untreated' seeds 5mm deep in the pots/trays labelled 'UNTREATED'.
- Fill out the first few prompts on the **Heat, Seed and Germination Report** on page 3 - 4.

3. Monitoring

- Water each of the pots/trays with the same amount of water daily and place them where they will receive sunlight.
- Observe the germination and growth of the seeds and record your results after 2 and then 4 weeks on the **Heat, Seed and Germination Report** on page 3 - 4.

Heat, Seed & Germination Report

Name: _____ Date: _____

Aim:

Hypothesis:

Equipment and materials:

Method (include a sketch):

Results: Record your observations in the table.

	Number of seeds planted	Number of seeds germinated after 2 weeks	Number of seeds germinated after 4 weeks	Comment on the health of the seedlings
Burnt				
Smoked				
Untreated				

Conclusion: What have you discovered about germination from this experiment?

Places

Let's create a place to explore the senses and inspire creativity.



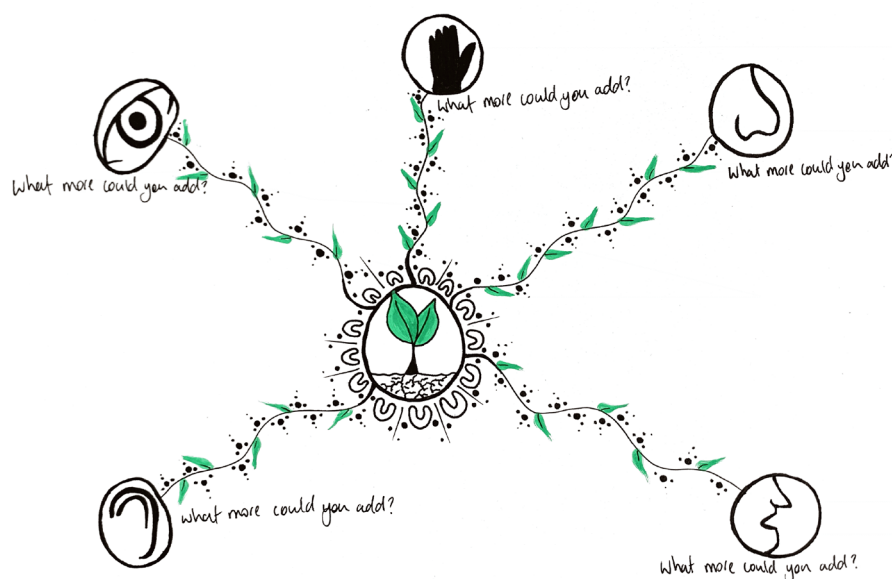
Investigate

Explore your school grounds and use your senses to decide on the ideal location for a bush bathing site that could double as an outdoor learning space. Complete the **Bush Bathing Wish List** in the activity sheets to record your responses.

Plan

What already exists on your chosen site? What extra elements will be required to create an amazing bush bathing space?

Using the **mind map** below and your five senses, write or draw what you'll need to help enhance the bush bathing space. Look at the site from different perspectives; from a distance, from within, from elevation and from the ground.



Take action

It's time to design the bush bathing space as per your wish list. View the **Bush Bathing Design Sequence** to learn the process of building a bush bathing site. Let these images inspire you to **Create Your Site** (activity sheet), including using the pocket planting method:



Monitor

How is the space being used? What's currently in flower? Which fauna is visiting the space? How does it make you and others feel?

Periodically complete the **Bush Bathing Observation** sheet. Appoint students to monitor the space regularly and report back any changes.

Celebrate

The bush bathing site will be celebrated every time it is used; every time someone stops to observe a bee or smell a flower.

Create a visual arts display (in groups or as an individual), celebrating the senses. Display these artworks throughout the bush bathing site in the form of a gallery for people to appreciate and become inspired. Incorporate the site into a larger visual arts display trail throughout the school.

Make a short film about the benefits of green spaces and being outdoors, spending time in nature.

Bush Bathing: Wish List



Explore your school grounds and use your senses to decide on the ideal location for a bush bathing site that could double as an outdoor learning space.

Materials

- A copy of page 2 for everybody or one copy per pairs of students.
- Clipboard and pen/pencil.

Task

As a class, walk the school grounds and agree on a site. If you have an existing outdoor learning area that could be utilised, think of ways to enhance it. Complete the table on page 2 to record a range of realistic enhancements for the space. Share your ideas with classmates and your teachers.

Senses	Examples	In what way would you like your senses to be enhanced in this space?
See		- Colourful flowers
Hear		- Wind creating noise
Touch		- Contrasting textures in bark
Taste		- Fruit
Smell		- Fragrant flowers

- What is already here in the space that you'd like to keep?
- What would you like to remove?

Bush Bathing: Design Sequence

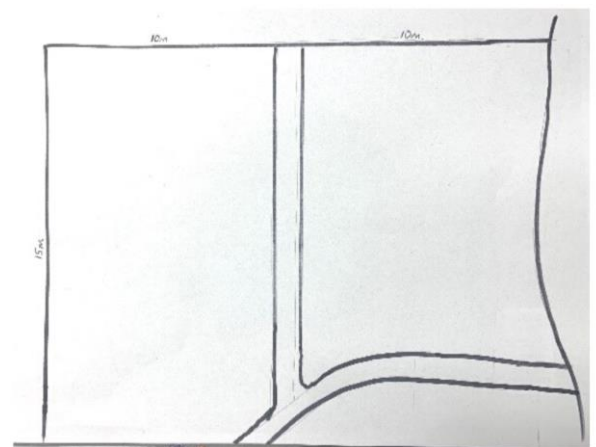


In groups, follow the sequence below to help you design your bush bathing site. Consider various ideas from different groups and combine these to establish your final plan.



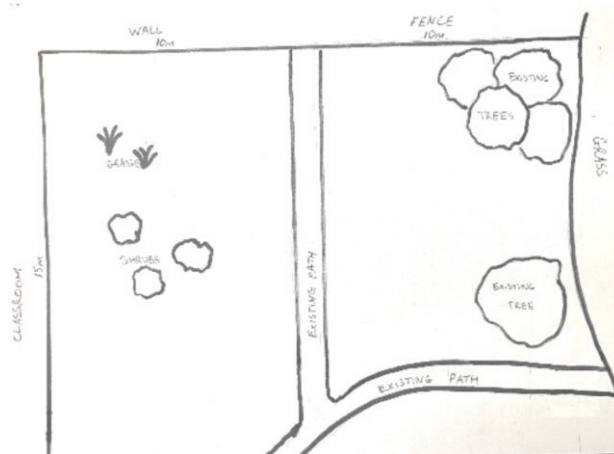
Step 1

Choose a site, which could be an existing garden or a grass/bare earth area with trees.



Step 2

Measure the area and draw the outline onto a piece of paper.



Step 3

Sketch in all the existing features such as trees, other plants, buildings, fences, retaining walls etc.



Step 4

Add the different elements to your design, beginning with the structural components such as paths.



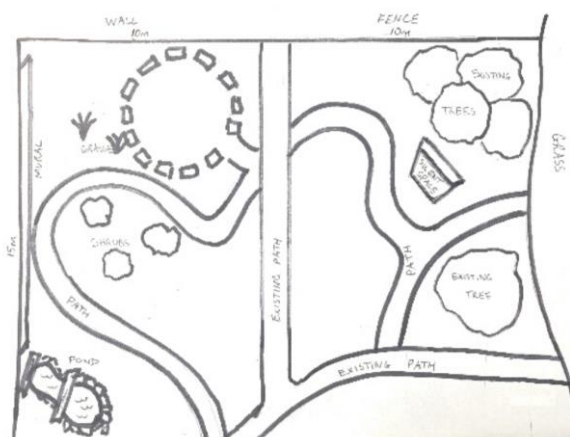
Step 5

Consider including interesting, yet comfortable seating.



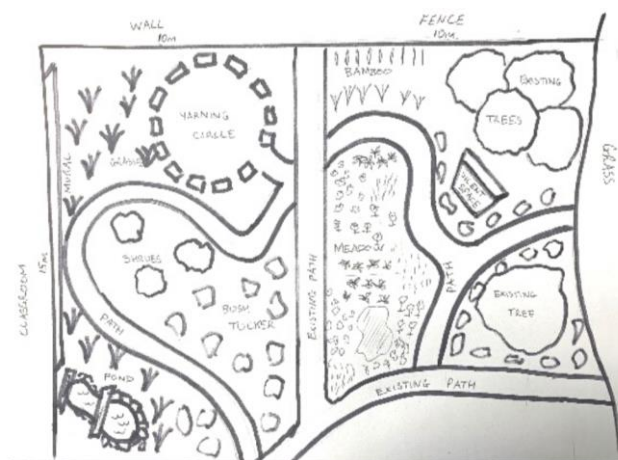
Step 6

Consider including murals & a Silent Space.



Step 7

Consider including ponds and other biodiversity-increasing spaces. Add these to your sketch.



Step 8

Sketch in your plant selection. Consider the size that plants will grow to.

Bush Bathing: Create your Site



Create the space in the same order that you designed it. See our tips for successful bush bathing below.

Be sure to watch the [video](#) on pocket planting before completing Step 5.



Step 1

Begin with structures and additional elements such as paths, seating and water features etc.



Step 2

Then check the quality of the soil. If it's compacted, cover with a minimum 200mm of woodchip mulch.



Step 3

If the area is or was covered with weeds or grass, cover the area with overlapping cardboard, wet down and then cover with a minimum of 200mm woodchip mulch.



Step 4
Select your plants!



Step 5
You can then 'pocket plant' straight into the mulch.



Step 6
Add signage to share knowledge with visitors to your bush bathing site.

Bush Bathing: Observation Sheet



How is the space being used? What's in flower?
Which fauna is visiting the space? How does it make you feel?

Materials

- A copy of page 2 for everybody or one copy per pair of students.
- Clipboard and pen/pencil.

Task

Make periodic observations of your Bush Bathing space and complete the table on page 2 to record your findings.

Date/ season temperature and conditions	Which plants are flowering now?	Which plants are fruiting now?	Is any maintenance required in the space?	Which pollinators and insects did you see today?
Dry, windy, 23° C	The wattle tree	Midgen berries	Cleared the paths and weeded the bush tucker area	At least 20 honey bees, some hoverflies and orange butterflies

Were there any other animals visiting the space?	How moist was the soil? Did you water, or has it rained recently?	What activity did you take part in today?	What did your senses experience?	How could we enhance the space further?
Wattle birds looking for nesting material	It rained last week and soil remains slightly moist.	Silent observation and weeding	I heard & saw the birds and bees and I felt the bark on several trees	I think we should add a bench seat under the gum tree.