

# Aussie Plants & People

This activity is about plant use.

The teacher notes include answers and explanations. They also have some ideas for extension work when you are back at school.

SUGGESTED LEVEL: Years 5-9

Further resources are available to you through the Gardens' web site, [www.anbg.gov.au/education/](http://www.anbg.gov.au/education/) and through the Environment Australia web site, [www.environment.gov.au](http://www.environment.gov.au)

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Australian National Botanic Gardens

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HEAD ED (that's you!).....

## AUSSIE PLANTS AND PEOPLE



**CANBERRA Today** — You are going to see lots of different ways different Australian plants have been used by different people.

What did Indigenous Australians use plants for?  
What about the early settlers?

### HOW DO WE USE PLANTS TODAY?

How do *we* help *plants*?

**BREAK OUT OF THE SQUARE!  
THINK BEYOND FOOD AND TIMBER!**

HOW ARE PLANTS IMPORTANT TO PEOPLE  
— AND PEOPLE TO PLANTS?

### Getting started

This activity follows the Gardens Main Path. It has markers every 10 metres that are black numbers on a grey background. You start today at the Visitor Centre.

### Suggested approach

#### PRE-VISIT

- Familiarise yourself with the booklet.
- Cover any preliminary student learning required.
- Visit our web site.

#### WHILE AT THE GARDENS

- It is more beneficial for your students to observe, discover and develop attitudes and values, rather than reading and writing comprehensive answers to questions.
- Many of these activities are designed to heighten their observation skills and encourage thinking about what they are seeing.

#### POST-VISIT

- Follow up the extension ideas offered in the booklet. Some of them can be used on the bus.

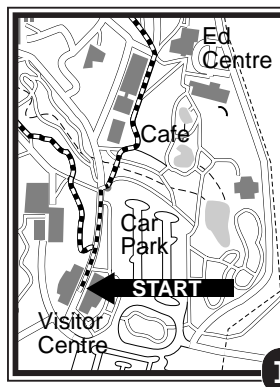
### Curriculum links

To help you evaluate your tour of the Gardens, some of the objectives and skills that are practised by your students when doing the exercises in this booklet are:

- observation
- description
- making comparisons
- recording
- critical analysis
- cooperative group activities
- word play.

They link across all the Key Learning Areas.

## Welcome to the Australian National Botanic Gardens in the national capital.





- The floral emblems of Australian states and territories are:
  - NSW Waratah, *Telopea speciosissima*
  - VIC Common Heath, *Epacris impressa*
  - QLD Cooktown Orchid, *Dendrobium phalaenopsis*
  - WA Red and Green Kangaroo Paw, *Anigozanthos manglesii*
  - SA Sturt's Desert Pea, *Swainsona formosa*
  - TAS Tasmanian Blue Gum, *Eucalyptus globulus*
  - NT Sturt's Desert Rose, *Gossypium sturtianum*
  - ACT Royal Bluebell, *Wahlenbergia gloriosa*

- You could discuss other uses of plant symbolism like:
  - The Wars of the Roses (Britain, 15th century)
  - Grace Bros waratah logo
  - Poppy cosmetics logo
  - The thistle symbol of Scotland
  - The Canadian maple leaf
  - The Remembrance Day poppy
- Does your school have a floral emblem? If not, why not give it one? To find out how, look at our web site: [www.anbg.gov.au/education/floral-emblem-ed](http://www.anbg.gov.au/education/floral-emblem-ed)

**[BUSTED!]**

- Banksias are representatives of the family Proteaceae.

**EXTENSION PROJECT**

- Investigate Banks' botanical tasks on the voyage of Captain Cook's *Endeavour*.

**2.2**

- The durability of the timber is due to the presence of an essential oil, methyl eugenol, which imparts a distinctive odour. The oil can represent up to 7% of the timber by weight, giving the timber a high resistance to attack by rot and marine organisms.
- The timber was used:
  - for house fittings and panelling
  - to make boats.
- Huon Pine is now a protected species and the timber is no longer logged—though some fallen trees are being retrieved from dams and lakes and are used for wood turning, carving, kitchen utensils and containers.

**FROM** the Visitor Centre, go down the steps on the southern side to find *Acacia pycnantha*, the Golden Wattle. In 1988 the Golden Wattle was proclaimed as Australia's national floral emblem. This specimen was planted by Hazel Hawke, the wife of Prime Minister Bob Hawke. Our national colours are based on the green and gold of this wattle.

**Can you think of other plants that have been used as signs, symbols or emblems?**



**Busted!**

Go back up the steps to the Visitor Centre then along the Main Path towards the Rainforest Gully. You'll see a 'bust' (a sculpture of someone's head and shoulders) of one of the earliest known botanists of Australian plants, Joseph Banks.

**What group of plants now commemorates his work?**



Further along the Main Path a variety of decorative Australian plants is displayed. They are often used in home gardens around Canberra and elsewhere.

**WHICH ONES WOULD YOU CHOOSE TO GROW IN YOUR OWN GARDEN?**



**1 4**

At the bridge over the Rainforest Gully, spot the Blackwood (*Acacia melanoxylon*). This tree provides shade for the understorey of the Tree Ferns (*Dicksonia antarctica*).

Blackwood timber was used by Indigenous Australians to make tools but is now prized for making quality furniture.



**2.2**

(What does .2 mean?)

While on the bridge, look on the down-side for the small Huon Pine (*Lagarostrobos franklinii*). It is the small tree with the big label. This tree may live for thousands of years but grows very slowly. This one is less than 30 years old. Huon Pines are found only in Tasmania and were harvested by convicts in the early days of settlement for their timber.

The timber is soft, durable and resistant to rot and marine organisms.

**Suggest what the early convicts might have made from Huon Pine timber.**

9.6

- Twice as long as its middle to its end!
- They might have made:
  - baskets, mats, fishing line, necklaces...

13

21

### EXTENSION PROJECTS

- Students could investigate further uses of oils from the Myrtaceae family:
  - as domestic and industrial degreasers
  - as solvents for specific glues and plastics
  - in a variety of medicinal uses—for example, tea tree oil has antibacterial and antifungal properties.

Dear Con,  
*Eucalyptus oil is used as an inhalant and in lozenges for the relief of coughs and colds.*  
 Signed,  
 Head Ed

18.5

- Some people today use paperbark in place of foil for barbecuing fish.
- Paperbark is also used to line hanging baskets—for a more natural look.
- Early settlers used the bark for patching their huts, as trays and in place of products we now make of cardboard.
- Some Indigenous Australians used the bark for swaddling babies, for patching canoes, as a fire tray and as shelters.

9.6



### HOW LONG IS A PIECE OF STRING?

Indigenous Australians used the fibre from the leaves of *Dianella revoluta* to make string.

Suggest what they could have made with the string.

11.5



But Indigenous Australians used plants for many other purposes. For example, they gathered nectar from flowers, particularly from *Banksia* and *Callistemon* (bottlebrush).

**Suggest how and why they did this.**

13

21

### Nature's Pharmacy

The path now enters an area displaying a group of plants of the family Myrtaceae. This family includes gum trees (*Eucalyptus* species), bottlebrushes (*Callistemon* species), tea trees (*Leptospermum* species) and paperbarks (*Melaleuca* species). Myrtaceae dominate Australian vegetation.

### Letters to the editor

Dear Head Ed,

When I tread on gum leaves, why do they smell of cough mixture?

Signed,  
 Con Fused

### ON THE BUS...



**Write your reply to Con.**

Dear Con,

Signed,  
 Head Ed

18.5

### THE BUSH HARDWARE SHOP!

The layers of soft, papery bark on the *Melaleucas* give them their common name, paperbark. Nowadays we use steam cookers, wrapping paper, mattresses, toilet paper and roof tiles but Indigenous Australians had the paperbark to do the same things!

24

### But, wait! There's more!

(Versatility, that is...)

Another multi-purpose plant is the grass tree (*Xanthorrhoea* species) which provided Indigenous Australians with edible starch in the base of the young leaves. Also, the long flower stalk made a lightweight spear shaft when dried. The trunk produces a resin which when melted made a very strong glue used to attach stone heads to axes and points to spears.

25

The Gymea Lily (*Doryanthes excelsa*) can have flower spikes up to 5 m high, topped by clusters of large crimson flowers during summer. You can buy these from the florist for up to \$300 each.

**Suggest why they are so expensive.**

24

- Early Australian settlers used the resin that exudes from its trunk to make a form of shellac, as an adhesive and as medicines for both constipation and diarrhoea. That's interesting!
- Early last century, large quantities were extracted for use in the chemicals and explosives industries.
- The fibrous trunks were also used as brake blocks for wagon wheels.

25

- Direct students' attention to the clumps, which can be divided to make multiple plants.
- Some Indigenous Australians used the tuberous roots of the Gymea Lilies, which they baked into a cake and ate cold. The juvenile flower stalks, up to 0.75 m, were also roasted and eaten.

- Although individual flowers are similar, when the flowers are grouped as in banksias or the Tooth Brush Grevilleas, the whole flower head may confuse.

- Mallee is easy to clear with chains.
- Then the area is used for growing crops.
- The wood was used to make charcoal.

### EXTENSION PROJECTS

- Suggest reasons why so much Mallee was cleared.
- Investigate the clearing of Australian native vegetation today.



- An environment rich in biological diversity offers the broadest array of options for:
  - sustainable economic activity
  - nurturing human welfare
  - adapting to change.
- Also, we do not know what other organisms may depend on each plant.
- A point of interest! The flowers of the Tumut Grevillea smell of mice! This may make them attractive to the small marsupials and bats that pollinate them.

### EXTENSION PROJECT

- Find out about a plant under threat in your region. Suggest actions that might save it.

### BACK AT SCHOOL

- In the eighteenth century, Carl von Linnaeus invented the binomial (two-name) system for naming all living things, using Latin, the language of Science at that time.
- We still use this system today.
- The genus name is followed by the species name:
  - Genus name *Eucalyptus* + species name *regnans* = *Eucalyptus regnans*

### EXTENSION PROJECT

- Find out more about Carl von Linnaeus.



The family Proteaceae is found only in the southern hemisphere and is prominent in the Australian bush. It includes such well known groups as *Grevillea*, *Banksia*, *Hakea* and *Telopea*.

Proteaceae are named after the Greek god Proteus, who could change his shape and form at will. As you walk along, note the *different* leaf shapes, sizes and textures as well as a *similarity* of flower forms.



**Mallee eucalypts** generally live in areas of irregular and low rainfall. Check out the swollen stem base ('lignotuber') of *Eucalyptus approximans*. Early settlers used these lignotubers for fuel as they burn slowly and with great heat.

**The Tumut Grevillea (*Grevillea wilkinsonii*) is a rare plant.**

**It is named after a local naturalist, Tom Wilkinson, who discovered it in the early 1980s. It occurs along the Goobarragandra River, near Tumut. Lots of different groups are working together to make sure this plant survives, including government agencies and local communities. We are propagating this plant here at the Gardens.**

**Why do we bother?**



### BACK AT SCHOOL...

It seems that the people who named all these plants were preoccupied with the ancient European world.



Why do all these plants have Latin or Greek names?

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Investigate this naming system further.



A 'cultivar' is a cultivated variety of plant. It may be a 'hybrid' (a mix of two plants) or may be a selected form of a naturally occurring species.

Can you find Jack McGuire's Red and Marian's Marvel? near 50.9



- The selection of forms for cultivars is usually based on factors such as:
  - flower colour
  - flower size
  - disease resistance
  - form of the plant
  - the habit of its growth.
- Many of these forms are grown for horticultural use and are widely available from plant nurseries.
- The Australian Cultivar Registration Authority is based at, and administered by the Gardens.

- May Gibbs' Snugglepot and Cuddlepie could be found sitting in a Scribbly Gum—and they were terrified of the Big Bad Banksia Men.
- The Gum Nut Editor wrote backwards because it took longer to read that way, and people thought they were getting more news for their money.

### EXTENSION PROJECT

- What other literature has focussed on plant life?
  - *The Day of the Triffids*

- The leaves and roots were crushed, releasing a toxin which paralyses the fish. This causes the fish to float on the water surface where they are easily collected.

### EXTENSION PROJECT

- Find out about the work of more artists who depict the Australian landscape and plants. You might consider: Arthur Boyd, Margaret Preston, Fred Williams, Charles Conder, Tom Roberts, Ada Clark, S.T. Gill, Tim Storrier, Russell Drysdale.
- Why stop at painters? Find out about the use of landscape in different media: textiles and fibre art, sculpture, performance art, glass art, ceramics, mosaic and inlay, mixed media...

### [FURTHER TEACHER NOTES]

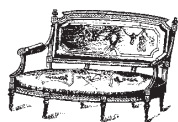
Go to web page:  
[www.anbg.gov.au/anbg/](http://www.anbg.gov.au/anbg/)  
 and click on Botanical Art.

## The botany of Botany Bay

The wide variety of decorative, low garden shrubs of this area reflect the diversity of soil and climatic conditions in the Sydney region. Joseph Banks was amazed at the diversity of plants on the shores of Botany Bay, which is why it got its name!

Hey, Con! Did you get that?

**Check them out.**



PLANTS FOR PEOPLE?  
NO! PEOPLE FOR PLANTS!

Sit for a moment and reflect. This seating was placed by the Friends of the Australian National Botanical Gardens so that you are able to do this.

### 'GIVE ME A HOME AMONG THE GUM TREES...'

Gum trees have provided people with lots of commodities over thousands of years.

**What do you have in your home that might have come from gum trees?**

CLUE:

We use more than just the timber!

## NATURE'S GRAFFITI!



The Scribbly Gum (*Eucalyptus rossii*) displays the feeding paths of small insect larvae but the decorative effect has provided inspiration for writers.

**Can you think of some Australian stories that are based on plants?**

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## WARNING! Don't try this on your goldfish!

The deep purple flowers of Australian Indigo (*Indigofera australis*) were used by some early settlers as a fabric dye. Some Indigenous Australians also used the leaves of *Indigofera* as an aid to catch fish.

**Suggest how they did this.**

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At the Eucalypt Lawn you can observe some fine examples of Australia's most widely distributed large tree species. Notice the variety of leaf colours and shapes and the distinctive barks.

Eucalypts have inspired countless Australian artists, such as Albert Namatjira, Arthur Streeton and Hans Heysen.

**Which tree inspires you the most? Why?**

**Why not sketch it here?**



87

- Because of the relatively low rainfall, these plants grow slowly, producing close-grained wood which is very hard.
- This wood is suitable for making:
  - spear heads, fire sticks, shields.

92

- The instructions at the sundial will help you here.

### EXTENSION PROJECT

- How do you tell the time if it is a cloudy day?

97.7

- Burke and Wills died at their camp on a journey of exploration into central Australia. They observed local Indigenous people eating Nardoo and thought they would do likewise. But they didn't grind the spores like the Indigenous people, and developed berri-berri (vitamin B deficiency).
- Indigenous Australians collected the Nardoo hard spore cases and broke them up on grinding stones, thus separating the spores, which were wet-ground, and made into damper.
- It is necessary to grind the spores in water to deactivate an enzyme, which would otherwise break down thiamine (vitamin B).

79



86

- Indigenous Australians ground the wattle seeds using grinding stones (mortar and pestle).
- Warning! Not all species are safe to eat.

### EXTENSION PROJECT

WATTLE THEY THINK OF NEXT?

The name 'wattle' originates from the process of 'wattling'. Many pioneers lived in huts consisting of 'wattled' walls

and bark roofs. Small rods or branches were woven together to form a lattice that was then daubed with clay or mud. Some plants from which the branches were taken for wattling were given the name 'wattles'.

Some Australian acacias are so prolific in southern Africa that they are now competing with the native plants.

How might the proliferation of these plants affect the people living in those regions?

### [TEACHER NOTES]

- Many Australian wattles were taken to South Africa to grow for the tannin in their bark.
- This question investigates how plants affect people.

### EXTENSION PROJECT

- Investigate a plant that has gone berserk in your area.

79



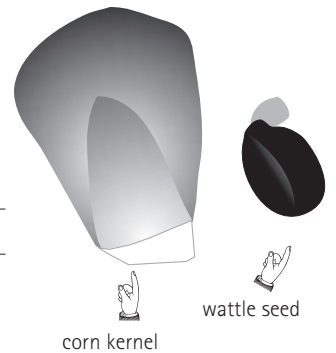
86

Wattles, with their distinctive fluffy yellow flowers and pea-like seed pods, belong to the largest and most widely distributed Australian genus *Acacia*. Indigenous Australians used

the seeds of some wattles to make a form of flour.

**Suggest what they would have used to grind the seeds.**

How long do you think it would have taken to collect and prepare enough of these seeds to make a damper for one person?



(size comparison)

87

The strong, hard wood from many inland plants (including some hakeas) was used by Indigenous Australians to make tools and weapons.

**Can you suggest some tools and weapons that could be made?**

\_\_\_\_\_

\_\_\_\_\_

92

### TIME OUT!

How long have you spent on this walk so far? Check out the time on the sundial up the hill.

**What happens to a sundial when daylight saving is introduced and can you suggest how you could modify a sundial for it?**

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\_\_\_\_\_

97.7

At the Rock Garden Pool, look for the Nardoo (*Marsilea drummondii*).

Nardoo is a low-growing aquatic plant with a leaf that looks like a large four-leafed clover. Nardoo was used by some Indigenous Australians as a food — but requires the correct preparation or you might suffer the same consequences as the Burke and Wills expedition!

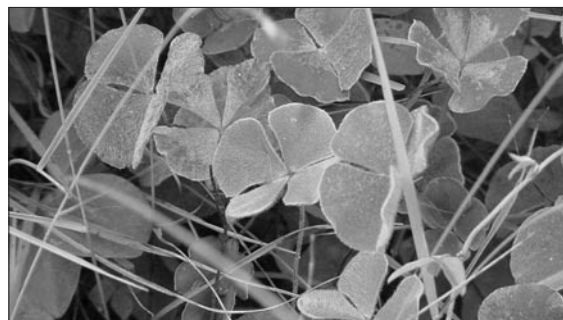
**What happened to them?**

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Nardoo (*Marsilea drummondii*)

## 100.8

- If you discovered a variety of a species that had not been found before, it might be named after you.
- If you developed a cultivar, you could name it after yourself.

### IN THE CLASSROOM

Using the scientific names of some of the species you have seen today, imagine you have just discovered some new varieties and they are to be named after you. How would your name sound? Try some different variations using your family name and your given names. eg:

- *Eucalyptus...*
- *Grevillea...*
- *Banksia...*

In reality, it's more complex than this.

### [TEACHERS' NOTES]

- There are rules here! Here are just a few Latin endings and what they mean when used in species names:
  - *ii* = male
  - *ae* = female
  - *iana* = this person was not involved in the plant's discovery
  - *iensis* = a locality, not a person
  - *is* = descriptive
  - *anus* = in honour of

## 102.3

*There was a young man  
with a fossil  
Who tired of Sydney's  
street jostle.  
He travelled around  
The Blue Mountains and found  
The Wollemi Pine was colossal.*

*Mr Noble was in the Blue  
Mountains,  
Enjoying the pools and  
the fountains,  
When what did he spy,  
Out a corner of eye?  
A Wollemi Pine that's worth  
countin'!*

### EXTENSION to the plant naming exercise

- What does '*nobilis*' really mean?
  - '*Nobilis*' means 'noble'.
- So did David Noble really get the pine named after him?
  - No
  - If the tree had been named after David Noble, it would have been called '*noblei*' or '*nobleic*'.

## 100.8

*Casuarina cunninghamiana* is named after Alan Cunningham, an early botanist who explored much of northern Australia.

How do you think you could get a plant named after you?

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## 102.3

# WHERE'S 'WOLLI'?

**FANCY HAVING A LIVING FOSSIL NAMED AFTER YOU!  
DID HE OR DIDN'T HE?**

David Noble is a modern-day explorer who came across this rare species in the Blue Mountains just west of Sydney. Scientists knew from the fossil records that a close relative of the Wollemi Pine (*Wollemia nobilis*) had existed two million years ago.

*Write a limerick about how Noble felt about his discovery.*

**THERE WAS A YOUNG MAN WITH A FOSSIL...**

How far back can you trace your relatives? Two million years?

## 107.5

The Australian Red Cedar (*Toona ciliata*) is now totally protected. This is a very young specimen, but in another 200 years might be big enough to use for the wonderful timber for which it is famous. Your great-grandchildren would have to move the path though, because it will grow so big.

**Would you rather your great-grandchildren built furniture or stood and admired the tree?**

## 108 A BURNING ISSUE!

*Hedycarya angustifolia* grows branches that are straight and of an even thickness. Indigenous Australians prized them for trade as fire-sticks.

**Suggest why they would be ideal for starting fires.**

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**Suggest other tools or weapons that could be made from this wood.**

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## 107.5

### EXTENSION PROJECT

- Organise an 'Anniversary Debate'—set in 2170 on the 200th anniversary of the Australian National Botanic Gardens—about cutting down this Red Cedar.

## 108

- Ideal for fires because:
  - It is hard — so it more easily creates friction with a soft base.
  - It is straight — so it's easier to twirl between your palms.
- Other tools or weapons include spear shafts and tips.

**EXTENSION PROJECTS**

- Penicillin comes from a plant. Find out about medicines that have come from rainforest plants.
- Indigenous people from many places around the world know about natural remedies. Find out about bush medicine in Australia.

- Because it resists termite attack, it is good for the supports for:
  - fences
  - houses
  - bridges
  - barns
  - storage sheds
  - shearing sheds.

- There are about 60 different lilly pillies and nearly all have edible fruits which settlers used to make:
  - jams and jellies
  - wines
  - refreshing summer drinks.

**FOLLOW-UP PROJECTS**

- Debate which people have made the most uses of Australian native plants: Indigenous Australians, early settlers or the present population? This debate could become quite heated. For example, how do you define 'the most uses' – numerically? aesthetically? or by value? But then, how do you define 'value'? The possibilities are endless...
- How have native plants been challenged in the last 200 years?
- Why should we value our native plants?

108.5



On the viewing platform of the bridge, spot the fine specimen of a Cabbage Tree Palm (*Livistona australis*). Palms like this are one of the distinctive features of rainforests in warmer areas.

**How could you make the roof for a cubby house using the leaves from this plant?**



116

The Bracket Fungus (*Trametes versicolor*) can be observed on the dead tree stump, part way down the gully. These and many other fungi help decompose dead plants and animals.

**What would the earth be like without them?**

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112.8



At the 'Commemoration Seat' think about this:

Rainforests possibly contain the earth's richest gene pool for future medicinal plants. They are a huge source of biodiversity, containing an estimated four million species of plants, animals and micro-organisms. Who knows the value of these plants! Yet we are still clearing rainforests in South America — and even Australia.

117.3

The Brush Cypress Pine (*Callitris macleayana*) contains substances that resist termite attack.

**Suggest what early settlers might have used this timber for.**

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123.5



The bright red berries of the Brush Cherry or lilly pilly (*Syzygium australe*) are edible and relished by many birds and people. Lilly pillies made great snack food for Indigenous Australians.

**Have you tried lilly pilly jelly?**



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