

# Teacher Notes

## Themes

- Australian native plants
- Features of different plants
- Adaptation to environment
- Using native plants

## Key learning outcomes

- Become familiar with some local plants
- Understand how flowers are part of the plant life cycle
- Recognise plant features that are adaptations to the environment
- Appreciate the diversity of Australian environments

## Key curriculum areas

- **Science:** Science Understanding (biological sciences); Science as a Human Endeavour
- **English:** Language, Literacy
- **Mathematics:** Data representation and interpretation; Statistics and probability
- **HASS:** Geography
- **The Arts:** Visual Arts
- **Cross curriculum priority:** Aboriginal and Torres Strait Islander Histories and Cultures; Sustainability

## Publication details

*Plantastic! A to Z of Australian Plants*  
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# Plantastic! A to Z of Australian Plants

Catherine Clowes and Rachel Gyan

## About the book

Did you know that there are plants that eat insects? Plants whose seeds spread in poo? Plants that move when you touch them? And plants that grow on other plants?

*Plantastic!* presents 26 of Australia's most unique and incredible native plants. Discover and identify native plants found in your local park, bushland, or even in your very own backyard.

With its perfect balance of fun facts, activities, adventurous ideas and gorgeous illustrations, *Plantastic!* will prove just how fantastic Australia's native plants really are!

## Recommended for

Readers aged 6–12.



PUBLISHING

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## About the author and illustrator

**Catherine Clowes** is a botanist and a teacher with a passion for Australian native plants. She works as a field botanist, is completing a PhD in botany and loves teaching students about the wonders of the plant world. Catherine wrote this book for her two kids, and she is excited to be able to share it with other young explorers too!

**Rachel Gyan** is an illustrator passionate about artful storytelling. Her heart-warming characters are empowered by whimsy, texture and vibrant colour palettes. Rachel enjoys studying Australian flora and wildlife, drawing inspiration from her surroundings to capture the beautiful and sometimes quirky nature of Australia in her work.

## Pre-reading questions or activities

### Practise plant identification

Ask the students to think about the plants they see around them. Walk around the school grounds or a local park and notice the different types of plants present. For different plants, consider:

- Is it a tree, shrub, grass, herb or climber?
- Is it flowering now? If it is, what colour and shape are the flowers?
- How big is it? How big are its leaves?
- What does the plant feel like? Does its bark or stem feel rough or smooth? Are the leaves shiny or hairy?
- Are the leaves or flowers scented?
- What sort of environment is it growing in (for example, a garden, the bush, along a waterway)?
- What is the plant called, and is it a native or introduced species?

Use a local plant guide or plant-identification app (such as iNaturalist or LeafSnap) to identify some plants.

### Become familiar with plant structure and biology

Look at a variety of plant specimens and identify the stem, leaves, roots, flowers and fruits (if present). Show a selection of short videos about different aspects of plants, for example:

- How plants work, Year 4 (<https://education.abc.net.au/home#!/media/104100/how-plants-work>)

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- Discover flower power! (<https://education.abc.net.au/home#!/media/104078/>)
- Why do plants make fruit? Years 3–5 (<https://education.abc.net.au/home#!/media/86130/fruit-why-plants-make-them>)

## Discussion questions

### Science

1. Investigate the structure of flowers and identify the ‘three Ps’ – petals, pollen and pistil – in specimens or pictures. *See Hibiscus, Lilly Pilly. Worksheet 2 ‘Parts of a flower’ shows them clearly, as well as sepals, stem and eggs inside the ovary. Make sure that students look mostly at simple flowers. Some flowers are inflorescences (see Acacia), in which lots of little flowers grouped together look like one flower. Daisies and sunflowers are examples of inflorescences, and the individual flowers can be hard to investigate.*
2. Many flowers are pretty, but bright colours and scent are not designed to impress people. What is the plant trying to attract?  
*They are attracting pollinators – insects, birds or mammals. See Hibiscus, Kangaroo Paw, Orchid.*
3. What is an ‘adaptation’ (see *Banksia*). Discuss examples of how plants have adapted to their environment.  
*An adaptation is a feature of a plant that helps it or its offspring survive in its environment. See Acacia, Drosera, Fan Palm, Gum Tree, Mistletoe, Orchid, Quandong, Noon-flower and Xanthorrhoea for descriptions of their adaptations.*
4. How have Australian plants adapted to bushfire?  
*Some plants need fire while others have adaptations to help them (or their seeds) survive fire. For example, some *Banksia* seed pods only open after fire, some Gum Trees have lignotubers or epicormic buds, *Xanthorrhoea* stems protect the plant from fire and they often flower after fire.*
5. Why was finding the Wollemi Pine in the New South Wales bush so remarkable? Discuss the discovery and how Wollemi Pines are being conserved.  
*Wollemi Pines are a living fossil – they belong to a family of plants that’s been around for 200 million years. Before their discovery in 1994 they were only known from fossils. There is only a small stand of around 100 trees, which is protected in a national park. Many people are also breeding Wollemi Pines and you can buy them in nurseries, which will help conserve the species.*
6. Some species of plants have a close relationship (called symbiosis) with other organisms. What does ‘symbiosis’ mean? Discuss some examples and think about: Who are the

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partners in the symbiosis? How does each partner benefit?

*Symbiosis is when two organisms (like a plant and a bacteria) live together and help each other in some way. See Indigo and Orchid for examples.*

7. Plants use sunlight to turn carbon dioxide and water into sugars (food) that are the basis of Earth's food webs. This is called photosynthesis:

carbon dioxide + water → sugar + oxygen

Discuss photosynthesis, and why plants are green and need sunlight to live.

Photosynthesis is also important because it produces oxygen, which we need to breathe.

Could we live without plants?

*See Jasmine (Native) for a description. We could not live without the food and oxygen plants provide us.*

8. Some of the plants in this book are not in the group called 'flowering plants'. For example, the Wollemi Pine is a conifer (it has cones rather than flowers) and the Tree Fern produces spores rather than pollen. Brainstorm other examples of plants that produce cones. Are *Banksia* flowering plants or conifers?

*Other pines also produce cones, like the introduced Radiata Pine, which is grown a lot for timber. There are also many native Australian conifers, like Cypress Pines and Hoop Pines. Conifers often have leaves like needles. Banksia are not conifers because they do have flowers – their 'cone' is a woody fruit rather than a true cone.*

9. Choose a plant in your local area and research more information about it. For example:
- Is it a native or introduced plant?
  - What is its scientific name?
  - Where does it grow? The Atlas of Living Australia lets you find where particular species are found: <https://bie.ala.org.au/>.

Present your findings to the class in a talk, poster or other format.

## English

1. Why do scientists use special scientific names for plants and animals? Hint: Does a Christmas Bush grow where you live? If so, what is its scientific name?  
*Common names can be used for different species – like Christmas Bush; and the same species can be known by different common names in different places. Scientific names are unique – each species is required to have its own distinct scientific name. See Christmas Bush.*
2. What is a scientist who identifies and names different species?  
*A taxonomist. See Pussy Tail.*

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## HASS

1. *Plantastic!* provides a map of plant ecoregions in Australia. Work out which ecoregion you are in. Using the information on the facing page to the map, see which plants described in the book occur naturally in your ecoregion.
2. Which plants occur all over Australia?  
*See Plant Ecoregions list: Acacia, Gum Tree, Rice Flower.*
3. Explore your area in the online Atlas of Living Australia to find out what plants have been recorded there: <https://biocache.ala.org.au/explore/your-area>. (Filter your search for Lifeform: Plants so you only get the plant specimens in your search.)

## Activities

### Science activities

#### *Plantastic! Quiz*

See Worksheet 1. Students can answer the questions as they read through the book.

Question	Answer
Which plant is the tallest flowering plant in the world? How tall does it grow?	<i>Gum Tree – can grow to around 100 metres</i>
Name a carnivorous plant. What does it eat?	<i>Drosera – eats insects, Utricularia – eats zooplankton</i>
Which plant is related to oranges and lemons?	<i>Zieria is in the citrus family</i>
Name three plants that can be eaten (only once you've checked it's the right type!). What part of each plant is used for food?	<i>Quandong (fruit), Yam daisy (roots), Hibiscus (flowers, fruits, roots, leaves)</i>
Which plant can help to clean polluted soil?	<i>Violet (shrub)</i>
Two plants in this book are parasites – which ones?	<i>Quandong, Mistletoe</i>
Which plant gives visiting insects a tap on the back?	<i>Stylidium, which are known as Trigger Plants</i>
How did Gum Trees get their name?	<i>From their sticky red sap</i>

#### *Flowers*

See Worksheet 2.

Optional: older students could also label: egg, ovary, sepal, stem.

#### *Fruits and seeds*

Investigate the seeds in some common fruits: cut an apple, avocado, melon or tomato in half and look for the seeds inside. Are there many seeds or just a few? How are the seeds spread when the plants grow in the wild?

#### *State floral emblems*

Research the floral emblem of each state and territory in Australia. For example, the Red and Green Kangaroo Paw in the book is the floral emblem of Western Australia.



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Look at this poster of floral emblems and ask students to say which one is their favourite, and why:

[https://parksaustralia.gov.au/botanic-gardens/pub/emblems\\_poster.pdf](https://parksaustralia.gov.au/botanic-gardens/pub/emblems_poster.pdf)

Teacher resource on Floral emblems of Australia:

<https://parksaustralia.gov.au/botanic-gardens/pub/emblems.pdf>

## English activities

*Plantastic!* includes a glossary of words that students may not know. Discuss why this is useful in an informative text. Help students to look up words they don't know in the glossary. If some unknown words in the book are not defined in the glossary, help students find and record definitions for those words.

Look up where the following plant names come from: *Eremophila* (Emu Bush), *Hybanthus* (Violet, shrub). Research the name of another common plant: *Banksia*. Who is it named after?

## Maths activity

Survey an area like the school grounds or a local park or garden. Record the plants you find in a table. For example, for each plant you could record the name, make a simple drawing or collect and paste in a leaf. Group the plants into categories of interest, for example by structure (tree, shrub, grass or herb), size, flower colour, or whether native or introduced.

## Art activities

### *Botanical drawing*

Choose a plant and paint or draw it, taking care to show the structures that help you identify it (such as flowers, leaves, fruits and seeds). Follow the example of the book's illustrations and make separate, close-up paintings or drawings of key parts. Students may keep a plant journal and re-visit a plant in different seasons so as to be able to record both flowers and fruit, for example.

This activity can be undertaken in a field trip if you have a suitable location to explore, or with plants in the classroom. Before you collect any plants, make sure it is allowed (for example, not in a national park or botanic garden).

Useful link on botanical drawing: <https://parksaustralia.gov.au/botanic-gardens/pub/topdraw.pdf>

### *Other plant art ideas*

Make an Australian bush necklace: <https://education.abc.net.au/home#!/media/2659607/how-to-make-an-australian-bush-necklace>

Press flowers: <https://www.rbg.vic.gov.au/news/flower-pressing-101>

Make leaf prints: <https://www.firstpalette.com/craft/leaf-prints.html>

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## Cross curriculum activities

The plants in the book are described using their Western names, but they also have other names which have been used by Aboriginal and Torres Strait Islander peoples for thousands of years. Indigenous Australians have many traditional uses for native plants. Describe how the following are used:

- Emu Bush *Medicine to treat headaches, cold, chest pain and fevers*
- Fan Palm *Use leaves to build shelters, make baskets and wrap food*
- Indigo *Catch fish by stunning them when the crushed plant is added to water*
- Xanthorrhoea *Spears, glue*
- Yam Daisy *Food*

Research other plants used by Indigenous Australians. Record the plant name, and the Indigenous name if you can find it, and describe how it is used.

Useful links include:

Aboriginal plant use in south-eastern Australia:

[https://parksaustralia.gov.au/botanic-gardens/pub/anbg\\_educationresources\\_aboriginalplantuse\\_150802.pdf](https://parksaustralia.gov.au/botanic-gardens/pub/anbg_educationresources_aboriginalplantuse_150802.pdf)

Bruce Pascoe: Aboriginal agriculture, technology and ingenuity (video series):

<https://education.abc.net.au/home#!/digibook/3122184/bruce-pascoe-aboriginal-agriculture-technology-and-ingenuity>

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## Worksheet 1

### Plantastic! Quiz

Question	Answer
Which plant is the tallest flowering plant in the world? How tall does it grow?	
Name a carnivorous plant. What does it eat?	
Which plant is related to oranges and lemons?	
Name three plants that can be eaten (only once you've checked it's the right type!). What part of each plant is used for food?	
Which plant can help to clean polluted soil?	
Two plants in this book are parasites – which ones?	
Which plant gives visiting insects a tap on the back?	
How did Gum Trees get their name?	

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## Worksheet 2

### Parts of a flower

This close-up photo of the centre of a native Hibiscus flower shows the ‘three Ps’: petals, pollen and pistil. Can you see them?



Photo by Todd McLay

This diagram shows a flower that has been cut through the middle, so you can see inside. Colour the drawing and label these parts: petal, pollen, pistil.

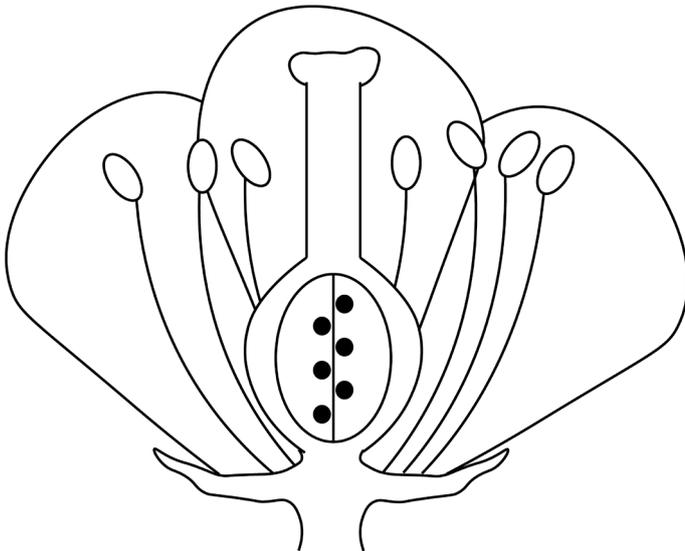


Diagram by Sarah Greenwood, CC BY-SA 4.0, Wikimedia Commons, <https://creativecommons.org/licenses/by-sa/4.0/deed.enCC> BY-SA 4.0

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## Australian Curriculum Links

Year level	Learning area: Science	Other learning areas
Years 1/2	<p><b>Science Understanding: Biological sciences</b></p> <ul style="list-style-type: none"> <li>Living things have a variety of external features (<a href="#">ACSSU017</a>)</li> <li>Living things live in different places where their needs are met (<a href="#">ACSSU211</a>)</li> </ul> <p><b>Science as a Human Endeavour</b></p> <ul style="list-style-type: none"> <li>Science involves observing, asking questions about, and describing changes in, objects and events (<a href="#">ACSHE021</a>)</li> <li>People use science in their daily lives, including when caring for their environment and living things (<a href="#">ACSHE022</a>)</li> </ul> <p><b>Science Inquiry Skills</b></p> <ul style="list-style-type: none"> <li>Use a range of methods to sort information, including drawings and provided tables and through discussion, compare observations with predictions (<a href="#">ACSIS040</a>)</li> </ul>	<p><b>English</b></p> <ul style="list-style-type: none"> <li>Describe some differences between imaginative informative and persuasive texts (<a href="#">ACELY1658</a>)</li> <li>Understand that different types of texts have identifiable text structures and language features that help the text serve its purpose (<a href="#">ACELA1463</a>)</li> </ul> <p><b>Mathematics: Location and transformation</b></p> <ul style="list-style-type: none"> <li>Interpret simple maps of familiar locations and identify the relative positions of key features (<a href="#">ACMMG044</a>)</li> </ul> <p><b>The Arts: Visual Arts</b></p> <ul style="list-style-type: none"> <li>Use and experiment with different materials, techniques, technologies and processes to make artworks (<a href="#">ACAVAM107</a>)</li> </ul> <p><b>HASS: Geography</b></p> <ul style="list-style-type: none"> <li>Interpret data and information displayed in pictures and texts and on maps (<a href="#">ACHASSI007</a>)</li> </ul>
Years 3/4	<p><b>Science Understanding: Biological sciences</b></p> <ul style="list-style-type: none"> <li>Living things can be grouped on the basis of observable features and can be distinguished from non-living things (<a href="#">ACSSU044</a>)</li> <li>Living things have life cycles (<a href="#">ACSSU072</a>)</li> <li>Living things depend on each other and the environment to survive (<a href="#">ACSSU073</a>)</li> </ul> <p><b>Science as a Human Endeavour</b></p> <ul style="list-style-type: none"> <li>Science knowledge helps people to understand the effect of their actions (<a href="#">ACSHE051</a>)</li> </ul> <p><b>Science Inquiry Skills</b></p> <ul style="list-style-type: none"> <li>Represent and communicate observations, ideas and findings using formal and informal representations (<a href="#">ACSIS071</a>)</li> </ul>	<p><b>English</b></p> <ul style="list-style-type: none"> <li>Understand how texts vary in complexity and technicality depending on the approach to the topic, the purpose and the intended audience (<a href="#">ACELA1490</a>)</li> </ul> <p><b>Mathematics: Statistics and probability</b></p> <ul style="list-style-type: none"> <li>Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (<a href="#">ACMSP069</a>)</li> </ul> <p><b>Art: Visual Arts</b></p> <ul style="list-style-type: none"> <li>Use materials, techniques and processes to explore visual conventions when making artworks (<a href="#">ACAVAM111</a>)</li> </ul> <p><b>HASS: Inquiry and skills</b></p> <ul style="list-style-type: none"> <li>Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns (<a href="#">ACHASSI057</a>)</li> <li>Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns (<a href="#">ACHASSI078</a>)</li> </ul>
Years 5/6	<p><b>Science Understanding: Biological sciences</b></p> <ul style="list-style-type: none"> <li>Living things have structural features and adaptations that help them to survive in their environment (<a href="#">ACSSU043</a>)</li> <li>Living things depend on each other and the environment to survive (<a href="#">ACSSU073</a>)</li> </ul> <p><b>Science Inquiry Skills</b></p> <ul style="list-style-type: none"> <li>Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (<a href="#">ACSIS090</a>)</li> </ul>	<p><b>English</b></p> <ul style="list-style-type: none"> <li>Select, navigate and read texts for a range of purposes, applying appropriate text processing strategies and interpreting structural features, for example table of contents, glossary, chapters, headings and subheadings (<a href="#">ACELY1712</a>)</li> <li>Use comprehension strategies to interpret and analyse information and ideas, comparing content from a variety of textual sources including media and digital texts (<a href="#">ACELY1713</a>)</li> </ul> <p><b>Mathematics: Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li>Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (<a href="#">ACMSP119</a>)</li> </ul> <p><b>Art: Visual Arts</b></p> <ul style="list-style-type: none"> <li>Explore ideas and practices used by artists, including practices of Aboriginal and Torres Strait Islander artists, to represent different views, beliefs and opinions (<a href="#">ACAVAM114</a>)</li> </ul>

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Year level	Learning area: Science	Other learning areas
All	<p><b>Cross curriculum priority: Sustainability</b></p> <ul style="list-style-type: none"><li>• 01.3 Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.</li><li>• 01.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.</li></ul> <p><b>Cross curriculum priority: Aboriginal and Torres Strait Islander Histories and Cultures</b></p> <ul style="list-style-type: none"><li>• 01.5 Aboriginal and Torres Strait Islander Peoples' ways of life are uniquely expressed through ways of being, knowing, thinking and doing.</li></ul>	

## Related books from CSIRO Publishing

*Exploring Soils* (2017)

*A Hollow Is a Home* (2019)

*The Forest in the Tree* (2020)

## Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: <https://www.csiro.au/en/Education>

## A note on the Glossary

We are aware of an error in the Glossary on page 62 of the first printing of *Plantastic!* The entry 'ETOPHYTES' should be 'GAMETOPHYTES'. We regret any inconvenience caused by this error.