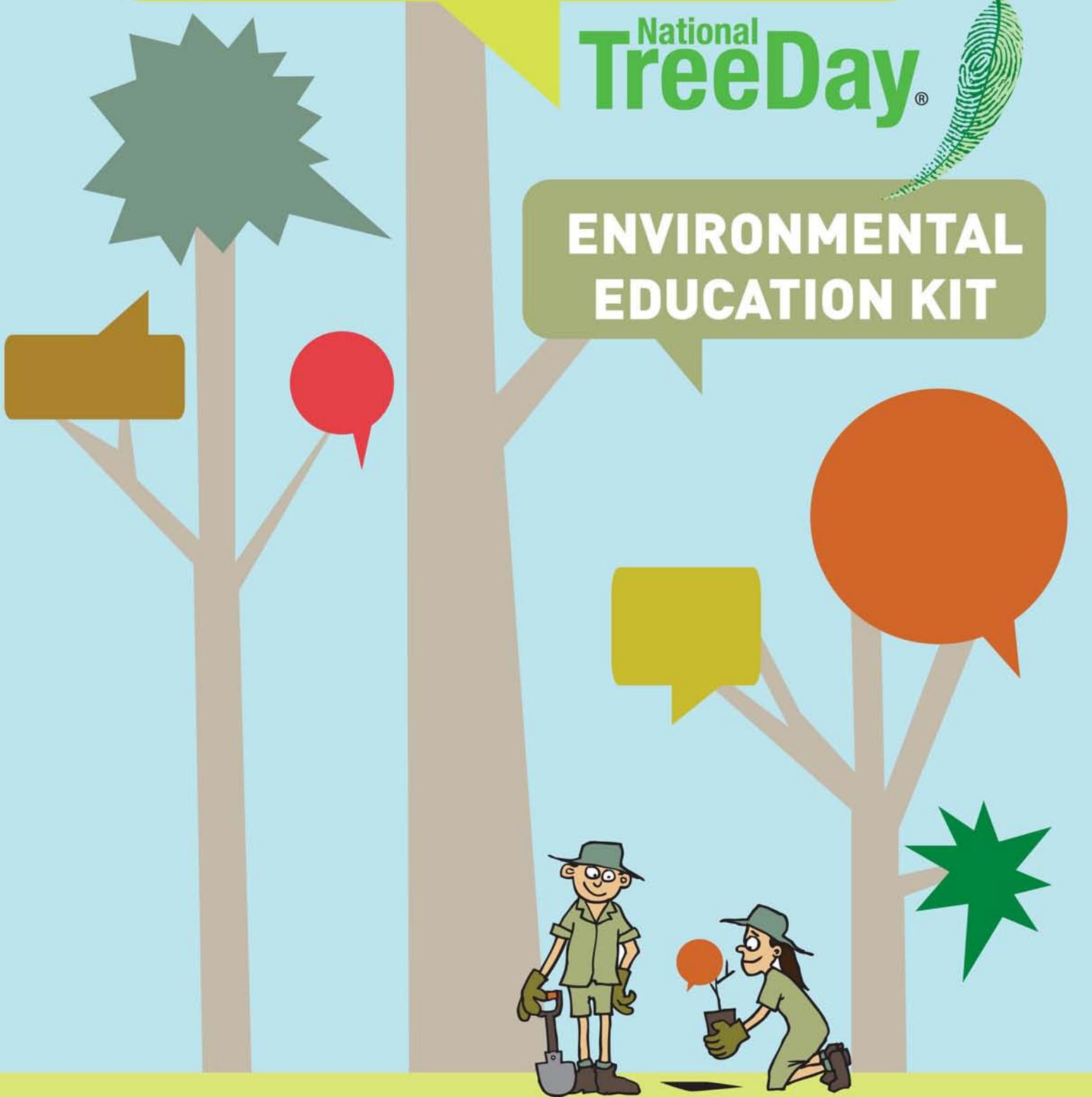


get growing!

National
TreeDay®



**ENVIRONMENTAL
EDUCATION KIT**



National Tree Day is organised by Planet Ark in partnership with Toyota Prius

PLANET ARK



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The 'Get Growing!': Environmental Education Kit has been produced by Planet Ark in partnership with the Australian Association for Environmental Education as an education and learning resource for teachers and students participating in Schools Tree Day and National Tree Day. *

This resource has been designed to increase the environmental, educational and community development outcomes of mass plantings of locally indigenous plant species and bush regeneration in benefiting Australian ecosystems, thereby satisfying the Aim of the National Tree Day project.**



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* National Tree Day 2008 is organised by Planet Ark in partnership with Toyota and the AMP Foundation.

** For more information on the Vision, Aim and Objectives of National Tree Day, please go to: treeday.planetark.org.

*** The Australian Association for Environmental Education (AAEE) is the premier, national, professional association for those who identify themselves as working in the fields of environment or sustainability education.

**** The National Tree Day Environmental Advisory Committee was set up to provide technical and specialist advice to enhance the environmental and social outcomes of the National Tree Day project. Member organisations include: Trees For Life, the Australian Association of Bush Regenerators, Greening Australia, Landcare Australia, the Australian Local Government Association and Education for Sustainability. For more information on the NTDEAC, please go to treeday.planetark.org.

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UNIT 1: WHY ARE TREES IMPORTANT TO YOU AND OUR PLANET?



TEACHER NOTES

UNIT OBJECTIVES

After completing this unit students will be able to:

Understand how plant communities came to be a part of our world

Articulate how trees are different to other plants

Understand the role and significance of native trees in helping and protecting the natural environment

Appreciate that trees have evolved over time and continue to change as natural and social conditions change

HELPFUL TERMS AND DESCRIPTORS (SEE GLOSSARY FOR DEFINITIONS)

- Biodiversity
- Ecological Community
- Ecosystem
- Ecosystem Services
- Habitat
- Native plants
- Plant Communities
- Riparian Zones
- Sustainability



FOCUS QUESTIONS

1. How did plants become part of our world?
2. How are trees different to other plants?
3. How do native plants help our environment?
4. How long do trees live and how can you tell their age?

OTHER RESOURCES AND WEBSITES SUPPORTING THIS UNIT

EVOLUTION OF PLANTS

http://www.siu.edu/~perspect/03_sp/plants.html

<http://www.bomengids.nl/uk/tree-evolution.html>

<http://scienceandevolution.blogspot.com/2007/12/how-trees-changed-world.html>

PLANTS AND HABITATS

<http://www.nps.gov/plants/pubs/nativesMD/info.htm>

<http://www.australian-backyard-wildlife.com>

BIODIVERSITY

<http://environment.gov.au/biodiversity>

<http://www.austmus.gov.au/biodiversity/what>

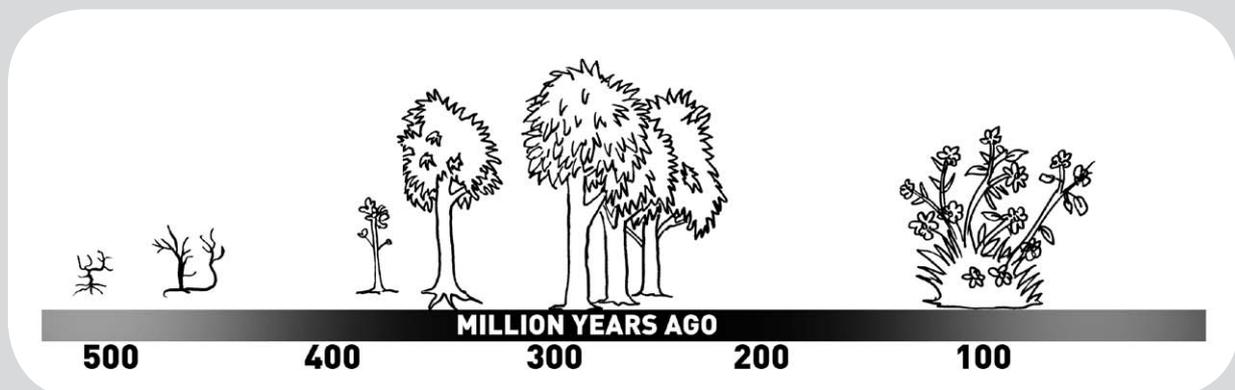
A visit to your local Botanic Gardens or National Park can also be an effective revision of this unit. Most state Botanic Gardens have resources and learning activities available too.

BACKGROUND INFORMATION

Trees and other plants developed slowly over millions of years after our planet was formed. The work of scientists and biologists has given us an understanding of how plants have developed during this time. Some of the very early plants have long gone, others are still with us and many have changed over time. Here is a simple history of how plants came to be the way they are today.

430 million years ago: Plants developed in the oceans but began to spread to land. These early plants had no roots, seeds or woody stems and needed damp conditions to propagate and survive. Algae, for example, began in the ocean, was washed onto the land, dried out and slowly developed waxy leaves containing pores and seed coats. Lichens and mosses also spread onto the land at this time. During this period there were no animals with backbones.

360 million years ago: The first larger plants which had roots and woody stems developed during the Carboniferous period. Giant tree ferns were plentiful during these times - the same trees which died and rotted away to become the coal and oil we use today. Seeds first appeared in plants at this time as well. Plants began to grow in drier places, arrange themselves into large clumps to form forests, scatter their seeds further afield and help to make and protect soils. It was about this time that reptiles (but not dinosaurs) began to appear on Earth. Trees at this time were mainly conifers and cycads.



270 million years ago: There was a big extinction of many plants.

100 million years ago: In the time of the dinosaurs (the Mesozoic Era) conifers, cycads and ginkos were dominant, and around this time flowering plants began to appear.

60 million years ago flowering plants began to take over and replace many of the conifers. Today, there are over 200,000 species of flowering plants on the planet. Grasses became more common also giving us the 10,000 species of today.

37 million years ago There were only half the number of species of plants on the planet as there are today.

20 to 25 million years ago there was an explosion of herbal plants because of a drier climate in many parts of the world.

Australia has been separated from the rest of the world for around 80 million years. In this time it has developed its own unique plants, like the many species of eucalypts and acacias we see today. Some have changed slightly over thousands of years, and have adapted to the different climatic conditions that we now experience.

This is one reason the existing native plants are the most appropriate plants for their respective locations, even though many have been replaced in large numbers by other plants. It also explains the reasons for so many different plants on the planet today and why biodiversity is so important. Eucalypts, for example, are prolific in terms of their number in Australia with over 700 different species identified. In the past it was not always like this.

STAGE 3

FOCUS QUESTION 1: HOW DID PLANTS BECOME PART OF OUR WORLD?

How have plants evolved?

Materials

Information from 'Background Information' page and the timeline.

ACTIVITY

Discuss with students the changes in plants over time (as outlined in the Background Information). Ascertain that different plants grow in different ways over different time periods and explain the variety of plants that exist on our planet today. This variety and number of plants is called biodiversity and measures how healthy our environment is.

Ask students to draw up a timeline (with pictures) representing the information located in the 'Background Information' section on the evolution of plant communities.

Students could also research one era or type of plant mentioned and do a more detailed presentation on that step in the evolution of plants.



FOCUS QUESTION 2: HOW ARE TREES DIFFERENT TO OTHER PLANTS?

What makes trees different to each other and to other plants?

Materials

Activity sheet 1.6

Clipboard and pencils

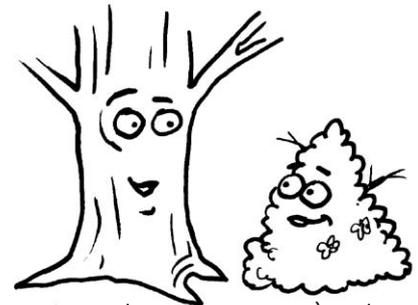
ACTIVITY

Refresh students memories about the way plants have evolved over time.

Ask students to suggest how plants differ (colour, size and shape of leaves, stems and seeds, age, etc) and how they reproduce in different ways (seeds, rhizomes, cuttings, spores, etc).

Take students to the playground and ask them to find 3 different plants (one of which is a tree) and fill in Activity Sheet 1.6.

Based on their discoveries from the playground, discuss how plants have adapted in different ways (e.g. shade/sun, soil type, availability of water, seed dispersal or method of propagation, sheltered or exposed position, age, etc).



FOCUS QUESTION 3: HOW DO NATIVE PLANTS HELP OUR ENVIRONMENT?

What role do native plants play in our environment?

Materials

Information from school library books or the Internet.

Interviews with National Park and Bushcare or Landcare officers, native nursery employees, officers from the Royal Botanic Gardens or Greening Australia.

ACTIVITY

Discuss the importance of having healthy native vegetation in your local area, and the world (corridor, habitat and food source for native wildlife; carbon cycle role; erosion control; aesthetics; shade; soil enrichment; wind breaks etc). Discuss the concept of biodiversity (the more naturally occurring species we have, the better they can play their special part in the environment by helping the soil keep its moisture, giving shade/protection to other plants, fertilising soil etc).

Explain that as most native plants have adapted to their environment over millions of years (remind them of the timeline), they are the most appropriate plant for the location in which they naturally occur. If they are replaced by other plants or removed then the ecosystem may become disturbed and damaged. Biodiversity may also suffer.

Students are then asked to select a native plant and to research its location, the site it occupies, the type of soil it grows in, how it has adapted to that site, the amount of water it needs, what other plants species are near it, whether it is associated with other plants (e.g. Is it part of the understorey? Does it provide protection for other plants?), the animals or insects that live with it, and to propose what might happen if the plant was cleared from the area.

Students make a presentation to the class summarising their research and stating the role their plant plays in the local ecosystem (e.g. Is it dependent on another plant or animal, is it part of a chain or connected to others by providing food or shelter?).

FOCUS QUESTION 4: HOW LONG DO TREES LIVE AND HOW CAN YOU TELL THEIR AGE?

How can plants tell us about the past?

Materials

Information Sheet B

Camera or pencils and paper



ACTIVITY

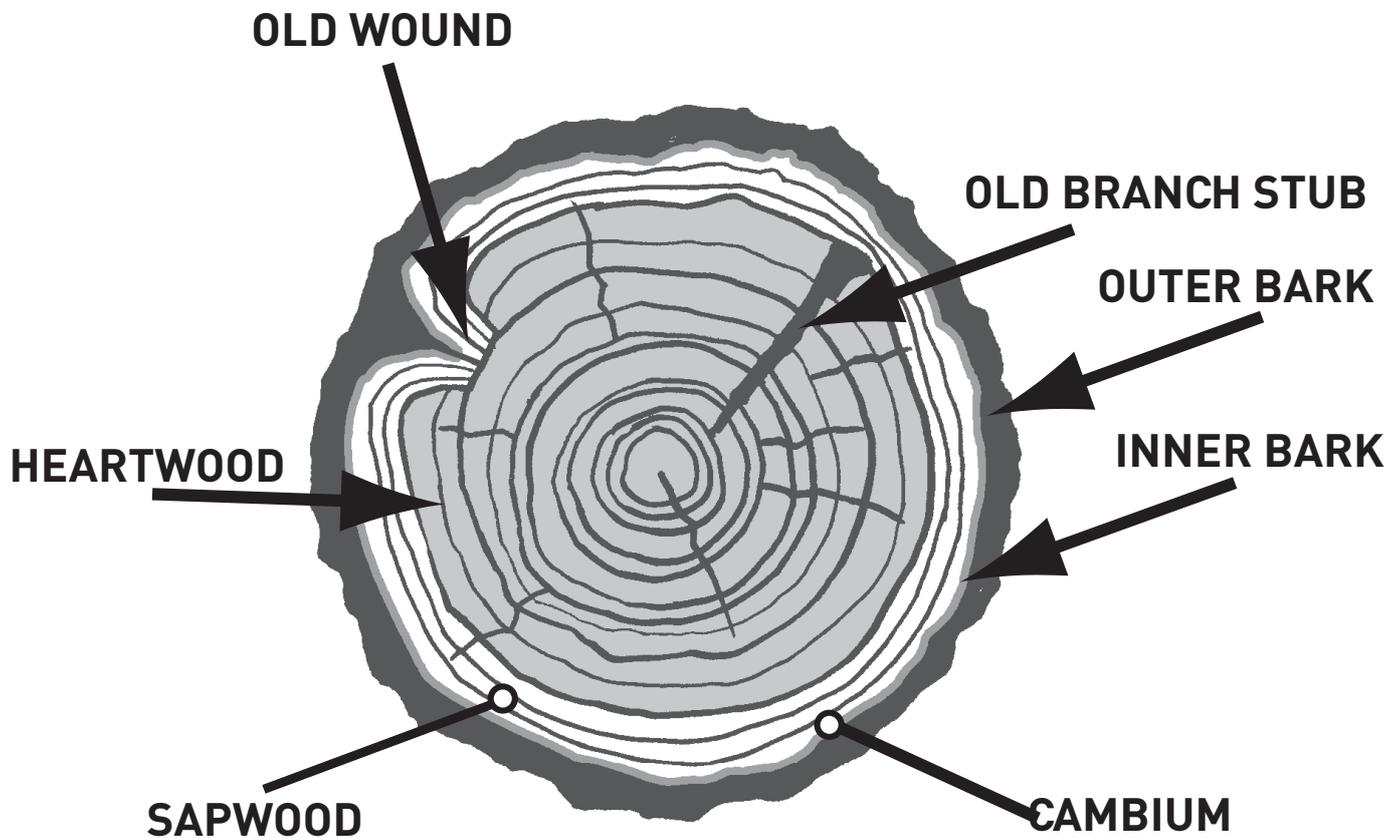
Using Information Sheet B (on a screen or OHP), discuss with students the rings on a cross section of a tree (if you can get an actual tree cross section, use that).

Consider each of the different layers and discuss why some rings are thicker than others. It could indicate wetter years (i.e. the thicker rings) and drier or drought years (the thinner rings). Discuss how the age of a tree can be determined by counting the number of rings (approximately, 1 ring = 1 year).

Take students into the playground and photograph or draw a variety of young and old plants. Comment on their age in terms of height, hollows, roots or any other signs. Ask students how old the trees might be and determine some guidelines on how you can tell the age of trees. Ask older people in the school (custodian etc) if they remember when certain trees and shrubs were planted to see if the students' estimates of tree ages were accurate.

Information Sheet B – Stage 2:

Measuring age and growth of plants and Stage 3: How can plants tell us about the past?



Outer bark- The protective outer layer of the trunk

Inner bark – Where the trees food flows

Cambium – Layer of living cells in the trunk located between the inner bark and the sapwood

Sapwood – Layer of wood outside the heartwood

Heartwood – Core of the trunk

Thicker rings indicate a wetter and healthier season while thinner rings can indicate drought or drier periods.

Dents, cracks, colouring or trails can indicate the impact of fire, insects, loss of branches, and inhibited or stunted growth.

Activity Sheet 1.6 – Stage 3:

What makes trees different to each other and other plants?

Name: _____ Date: _____

Write summary notes on the 3 plants you investigated here

Plant 1:	Plant 2:	Plant 3:
Draw a sketch of the plant:	Draw a sketch of the plant:	Draw a sketch of the plant:
Sunny position? Yes <input type="checkbox"/> No <input type="checkbox"/>	Sunny position? Yes <input type="checkbox"/> No <input type="checkbox"/>	Sunny position? Yes <input type="checkbox"/> No <input type="checkbox"/>
Soil Type Sand <input type="checkbox"/> Clay <input type="checkbox"/> Rock <input type="checkbox"/> Other <input type="checkbox"/>	Soil Type Sand <input type="checkbox"/> Clay <input type="checkbox"/> Rock <input type="checkbox"/> Other <input type="checkbox"/>	Soil Type Sand <input type="checkbox"/> Clay <input type="checkbox"/> Rock <input type="checkbox"/> Other <input type="checkbox"/>
Seed Dispersal Wind <input type="checkbox"/> Bird <input type="checkbox"/> Animal <input type="checkbox"/>	Seed Dispersal Wind <input type="checkbox"/> Bird <input type="checkbox"/> Animal <input type="checkbox"/>	Seed Dispersal Wind <input type="checkbox"/> Bird <input type="checkbox"/> Animal <input type="checkbox"/>
Water in Soil Dry <input type="checkbox"/> Moist <input type="checkbox"/> Wet <input type="checkbox"/>	Water in Soil Dry <input type="checkbox"/> Moist <input type="checkbox"/> Wet <input type="checkbox"/>	Water in Soil Dry <input type="checkbox"/> Moist <input type="checkbox"/> Wet <input type="checkbox"/>
Sheltered Position? Yes <input type="checkbox"/> No <input type="checkbox"/>	Sheltered Position? Yes <input type="checkbox"/> No <input type="checkbox"/>	Sheltered Position? Yes <input type="checkbox"/> No <input type="checkbox"/>
Approximate Age Less than 1 year <input type="checkbox"/> 1-2 years <input type="checkbox"/> 2-10 years <input type="checkbox"/> 10-20 years <input type="checkbox"/> 20+ years <input type="checkbox"/>	Approximate Age Less than 1 year <input type="checkbox"/> 1-2 years <input type="checkbox"/> 2-10 years <input type="checkbox"/> 10-20 years <input type="checkbox"/> <input type="checkbox"/> 20+ years <input type="checkbox"/>	Approximate Age Less than 1 year <input type="checkbox"/> 1-2 years <input type="checkbox"/> 2-10 years <input type="checkbox"/> 10-20 years <input type="checkbox"/> 20+ years <input type="checkbox"/>

What were the main differences you noticed between these three different plants?

'GET GROWING!' ENVIRONMENTAL EDUCATION KIT



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Unit 1 - Feedback and Evaluation Form

This resource has been developed to help students get the most out of their National Tree Day and/or Schools Tree Day event, and to provide learning experiences that enable them to grow into environmental custodians.

In order to improve this resource in the future, we would greatly appreciate your feedback.

Once completed, please fax this form to **02 4757 8980** or post to

Planet Ark Environmental Foundation, PO Box 4, Wentworth Falls, NSW 2782

Please answer the following questions:

Teacher Name: _____

School Name: _____

Grade/Class: _____

Which state do you teach in? _____

In which Local Government Area is your school? _____

Which stage of lessons did you implement? _____

Which focus questions did you implement? _____

Did your class participate in Schools Tree Day? Yes No

If so, on what date? _____

How did you hear about this resource? _____

Please remark on the following statements on the scale provided:

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel the lessons were effective in teaching their stated aims	1	2	3	4	5
I feel the class was engaged by the unit content	1	2	3	4	5
I feel the lessons were appropriate for their age and level of understanding	1	2	3	4	5
I found this unit useful for incorporating environmental education into my lesson planning	1	2	3	4	5
I feel this unit helped to increase my class' knowledge about the benefits of creating healthy native plant communities	1	2	3	4	5
I feel my class is now better equipped to be environmental custodians as a result of this unit	1	2	3	4	5
(If applicable) I feel this unit gave good educational support to our Schools Tree Day event	1	2	3	4	5

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Which lesson(s) did you find were the most effective?

Which lesson(s) did you think were ineffective or inappropriate?

Was there anything about the document layout that you found frustrating?

How would you like to see this unit changed or improved for the future?

Are there any other comments, feedback or suggestions you would like to make?

Are you happy for us to contact you for further feedback? If so, please provide a contact number:

Thank you for taking the time to fill in this evaluation form.

Your feedback will ensure that we can produce the best possible resources to support the valuable work you are doing in educating our children, the future leaders of our world.

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