Primary School Education Materials

PLANTS GALORE
Understanding Plants by Grouping

Teacher Notes and Student Activities

This package deals with the NSW Science and Technology K-10 curriculum objective of: Develop knowledge of the natural environment through understanding about the physical world, earth and space, and living world.

The following curriculum outcomes are addressed:


The package includes a range of activities and adaptations suitable for children K-6.
ABOUT THE HUNTER REGION BOTANIC GARDENS

We offer a variety of activities at the Gardens, including guided tours for school groups. Our resources include specialist theme gardens, the Gundabooka Trail (illustrating Koori use of native plants), a sheltered Education Pavilion with indoor display, a Botanical Library and Herbarium, and bush walking trails that display different native vegetation communities.

The Hunter Region Botanic Gardens are managed and maintained by volunteers for the enjoyment and education of the people of the Hunter Region and visitors from other areas.
This package of activities covers:

- The diversity of plants
- The characteristics and components of plants
- Ways that plants can be grouped
- The structure of plant communities

Plants Galore focuses on the diversity of plant life (particularly Australian native plants). The unit introduces students to the fundamentals of classifying plants into meaningful groups by examining various features that many plant species have in common (i.e., flowers, fruits, and foliage). The central concept of this unit is diversity in plants.

Each species of plant is either slightly different or very different from other species. Some plant species are very similar to others, and are often closely genetically related. Botanists have long grouped plants according to sets of characters, notably flower structure, leaf shape and structure, types of fruits, types of bark, and plant height.

Usually we consider not just one character to tell if a plant is related to another, but rather a set of characters. For example, the Pea family not only has flowers which are very similar (always having a standard petal, wing petals, and a keel), but also has fruits which are legumes (pods which split down two sides), little nodules on the roots, and leaves often trifoliate (split into three sections).

There are other characteristics that can be used to classify plants. There is a large group of plants that we depend on for food and there is another group that provide us with other useful products (e.g., timber, eucalyptus oil, cut flowers). There is also a small group of plants that might be labelled dangerous (e.g., nettles, rhubarb leaves, thorny plants).
Pre-exursion school-based activities

1. Introduce students to relevant vocabulary.

   Biodiversity – the variety of plants and animals in an environment
   Plant environments – the communities of plants that grow in different locations
   Classification – a way in which we group and sort items
   Leaves – in most cases, they are structures that grow on the end of plant stems and they play an important role in producing the oxygen we breathe
   Seeds – a baby plant enclosed in a protective cover
   Flowers – the part of the plant that produces seed
   Bark – the outside cover of a plant stem or trunk

2. Discuss with students the wide range of plants we use for food. Using the classification below, ask students to identify as many plant food examples as they can.

<table>
<thead>
<tr>
<th>Plant part</th>
<th>Food examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td>Lettuce</td>
</tr>
<tr>
<td>Stems</td>
<td>Celery</td>
</tr>
<tr>
<td>Roots</td>
<td>Carrot</td>
</tr>
<tr>
<td>Fruit</td>
<td>Apple</td>
</tr>
<tr>
<td>Nectar</td>
<td>Honey</td>
</tr>
</tbody>
</table>
Post-excursion school-based activities

Following are questions that may reinforce student learning following an excursion to the Hunter Region Botanic Gardens:

- What leaf shapes did you see?
- What leaf edges did you see?
- What is the difference between a shrub and a tree?
- Why do insects and birds visit flowers?
- How does a Grevillea flower get pollinated?
- What smells did you experience from some plants (e.g., eucalypt and native mint leaves)?
- What uses did Indigenous people make of some plants?
- How does bark help plants?
- What dangers are presented by some Australian plants?
- What are some uses of Australian plants?
- What is the difference between a native (Australian) plant, and an exotic plant?
- How long do different plants live?
- What is the floral emblem of the Hunter Region Botanic Gardens? (It’s the Burrawang)
- What is the floral emblem of the State of New South Wales?
Possible Garden Field Excursion Locations

1. The Location Map (to orientate students)
2. The Botanic Walk path passing Banks’ Place
3. The Grevillea garden (or nearby themed gardens such as wattles and mint bushes), to observe variation in flower structure and colour, and leaf structure
4. The Succulents Garden (to study variations in plant structure)
5. The Open Forest near Gundabooka (to experience different plant structure from trees to ground covers)
# STUDENT ACTIVITIES

## ACTIVITY 1 Leaf Shapes

Can you find examples of each of the following leaf shapes? Collect your leaves and draw your example next to each shape.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Leaf Shape 1" /></td>
<td><img src="image2.png" alt="Leaf Shape 2" /></td>
</tr>
<tr>
<td><img src="image3.png" alt="Leaf Shape 3" /></td>
<td><img src="image4.png" alt="Leaf Shape 4" /></td>
</tr>
<tr>
<td><img src="image5.png" alt="Leaf Shape 5" /></td>
<td><img src="image6.png" alt="Leaf Shape 6" /></td>
</tr>
</tbody>
</table>

Did you find leaves that were different to these shapes? Draw them below.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
ACTIVITY 2 Forest Layer Cake

Look at the bush scene in front of you. How many layers can you see?

Are there ground covers, grasses, shrubs, trees and other plants?

Count the layers and write the number here  ..........  

Draw each of your layers in the picture below.
ACTIVITY 3 Gum Nuts

Gum trees (eucalypts) make very hard seed pods to protect their seeds. When ready, a cap on the seed pod falls off to release the seeds to fall to the ground. There, the seeds can grow into new trees.

Different types of gum trees make different types of seed pods.

Look for and collect three different types of gum tree seed pods that have fallen to the ground on your walk.

Find some clear space in the Gardens and have your class members place their gum nuts there. Take turns to match and place the nuts into different groups. How many groups are there?
ACTIVITY 4 DRAWING PLANT SPECIMENS

Botanical drawing is a type of art where the artist draws the plant as it looks. You’ll need a sharp B or HB pencil, some white paper, and a plant specimen. Check *Drawing Aussie Flora* on the resources page in this package for more tips.

The drawings below are by Stephanie Monkhouse, a Year 5 student from St. Bede’s School, Braidwood, NSW.
ACTIVITY 5 BANKSIA FLOWERS

There are about 170 different types of Banksia in Australia. They have colourful flowers that make lots of nectar. Possums, birds, insects, bats and bees like to feed from the flowers.

Join the dots and colour the picture of the Silver Banksia below.

From the Australian Network for Plant Conservation
anpc.asn.au/kids-resources
ACTIVITY 5 BARKING UP THE RIGHT TREE

Start at the Red Ash tree in front of the Visitor Centre. Can you match the bark on the Red Ash tree with the correct picture on this or the next page? When you’ve matched the picture, use two or three words to describe the bark on this tree.

When you’ve done this, walk over to the Eucalypt Lawn and find the trees that match each of the other pictures and give a description of their bark.
NOTES FOR GUIDES

Before starting the tour

1. Review important vocabulary for the visit (i.e., leaves, seeds, flowers, bark, biodiversity, plant environments, classification).

2. Using dried specimens (e.g., leaves, seed pods) from two very different plants ask students how we know they are different. Introduce the idea of similarity and variation in leaves, seeds, flowers and bark.

During the tour

1. Visit at least two Garden habitats to illustrate how the characteristics of plants is influenced by their environment (e.g., the forms of plants growing in wetlands, and the similarity of plant structure in the succulent garden).

2. Select children to carry collection bags for plant specimens collected from each visited environment.

3. Give examples of plant variety in one or more of the theme gardens. For example, contrast the similarity of grevillea flowers with their diversity in colour and shape, and the differences across acacia leaves.

After the tour

1. Display collected Gardens specimens and review examples of ways we can group plants according to leaf, seed, flower and bark character.

2. Review children’s learning with questioning:

   What different leaves, seed pods, flowers and bark did we see today?

   What are some ways we can group plant leaves, seed pods, flowers and bark?
PLANTS GALORE RESOURCES

For children
Australian National Botanic Gardens. Drawing Aussie Flora
NSW Department of Education. Plants—School A to Z
Australian Department of the Environment. Wetland Word Games
News Life Media. Gardening for Kids

For teachers, parents and guides
Australian Department of the Environment. Discovering Wetlands in Australia
CSIRO. Biology Activities and Experiments for Kids
Australian National Botanic Gardens. Floral Emblems of Australia Education Kit
Australian National Botanic Gardens. Rainforest: Surviving the Wet and Dark