

## Unit 2.1: How plants get their names?

### Purpose and Scope

For most people, botanical (scientific) names just seem too difficult to handle, with nearly impossible pronunciations and in a language too old to comprehend. Yet they contain a wealth of information from the appearance and qualities of the plants to the explorers who discovered them and the scientists who named and studied them.

By researching on some of the most influential botanists from the 18<sup>th</sup> and 19<sup>th</sup> centuries, students gain insights into their contributions to science, the naming of plants and the stories around them. The Unit also introduces students to the international system of nomenclature, meanings of the most commonly used Latin words in botanical names, as well as some of the common names of our local plants.

### Assessment Strategy for Core Learning Outcomes in Science<sup>27</sup>

3.1: Students relate some of the ways that people of various historical and cultural backgrounds construct and communicate their understandings of the same natural phenomena.

- Students explore and elaborate on the knowledge and journey of learning of early explorers and scientists of different nationalities who have collected and / or worked on Australian plants.

4.1: Students outline some contributions to the development of scientific ideas made by people from different cultural and historical backgrounds. Students:

- communicate and demonstrate their understandings of the knowledge early botanists have about the morphology and qualities (including use) of Australian plants.
- synthesize information from different sources and group investigations about contributions made to botanical science and modern taxonomy and classification.

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<sup>27</sup> Adapted from: QLD School Curriculum Council, 1999. *Cultural and historical science*. Years 1 to10 Sourcebook module for Science in Upper Primary, Level 3–4. [www.qsa.qld.edu.au/downloads/syllabus/kla\\_sci\\_sbm\\_ss\\_401.pdf](http://www.qsa.qld.edu.au/downloads/syllabus/kla_sci_sbm_ss_401.pdf) (accessed Dec 08)

## Lesson 2.1.1: About early explorers and botanists

Students find out by themselves the background and life-time achievements of some of the most influential early explorers and botanists who have collected or worked on Australian plants. By researching and presenting the biographies of these influential people, students learn about early Australian history and how major events might have shaped their lives, and in turn, the current botanical knowledge. In recognition of their contributions, many of these explorers and botanists have plant species (e.g. *Araucaria cunninghamii*, *Amyema cambagei*) or entire genera (e.g. *Banksia*, *Flindersia*, *Backhousia*, *Woolfsia*) named after them. By learning about the stories behind these people and in some cases, relationships between them, students may relate more vividly to the particular plant groups.

### Key Activities / Resources (about 2 hours)

Preparation and materials:

- Computer stations with broadband access
- Australian Dictionary of Biography (printed or online edition)
- Names of influential explorers / botanists printed on small pieces of paper, folded up for draw:
  - Carolus Linnaeus (Swedish, 1707–1778)
  - Daniel Solander (Swedish, 1733–1782)
  - Joseph Banks (English, 1743–1820)
  - Matthew Flinders (English, 1774–1814)
  - Allan Cunningham (Scottish, 1791–1839)
  - James Backhouse (English, 1794–1869)
  - William Woolls (English, 1814–1893)
  - Ferdinand von Mueller (German, 1825–1896)
  - James Hamlyn Willis (Australian, 1853–1993)
  - Richard Hind Cambage (Australian, 1859–1928)
- Sheets of A3 paper
- *What Native Plant is That?* Herbarium Plus folder from NICA.

As a class:

- Ask students if they know any famous or influential botanists or natural scientists.
- Suggest some of the names identified above to test their prior knowledge about them.
- Discuss the kind of information they will collect about the scientists. In a large chart, they write down the agreed information, such as:
  - Specific biographical details (name, place and date of birth and death)
  - Significant historic or personal events
  - Influential peoples (including other scientists) in their lives
  - Disciplines and locations of study, research or explorations
  - Major discoveries, theories and / or publications
  - Recognition given to their work, including the plants named after them

In groups of 3 to 4:

- Send one person from each group to draw from the names of scientists to be studied.
- Find out what you can about them, from library references and internet searches (e.g. [www.adb.online.anu.edu.au](http://www.adb.online.anu.edu.au) and <http://en.wikipedia.org> ).

- Prepare A3 posters which illustrate the information collected, focusing on what has been agreed earlier as a class and highlighting any additional points of interest. Perhaps include pictures of the plants named after them.
- Present the posters to the class, ensuring that each member of the groups contribute to the presentation. Allow brief question time after each group.

Summing up the research:

- Have all the posters pinned up for display in chronicle order (from the earliest botanist to the latest) and subsequently file into Herbarium Plus.
- As a class, discuss what they have learnt during their research. Highlight the contribution of Carolus Linnaeus to modern taxonomy. Often referred as the "Father of Taxonomy", his binomial (two names) system of naming organisms in Latin is still in use today, although the naming, ranking and classification systems have undergone many changes<sup>28</sup>.
- Encourage students to look up the plant genera or species that have been named after the scientists.

### **Related Activities / Resources:**

*Activity: Biography of a famous scientist*, in QLD School Curriculum Council, 1999. *Cultural and historical science*. Sourcebook module for Science in Upper Primary, Level 4<sup>29</sup>. p.17–18.

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<sup>28</sup> Carl Linnaeus (1707-1778). [www.ucmp.berkeley.edu/history/linnaeus.html](http://www.ucmp.berkeley.edu/history/linnaeus.html) (accessed Jan 09)

<sup>29</sup> QLD School Curriculum Council, 1999. *Cultural and historical science*. Years 1 to10 Sourcebook module for Science in Upper Primary, Level 3–4. [www.qsa.qld.edu.au/downloads/syllabus/kla\\_sci\\_sbm\\_ss\\_401.pdf](http://www.qsa.qld.edu.au/downloads/syllabus/kla_sci_sbm_ss_401.pdf) (accessed Dec 08)

## Lesson 2.1.2: How do we classify living things?

Students are first tuned into the subject by sorting and cataloguing plants and animals using their own intuition. In the process, they investigate the criteria that may be used in classification of organisms. They are then introduced to the classic taxonomic classification and binomial system of nomenclature.

### Key Activities / Resources (at least 1 hour)

Preparation and materials:

- The week before class, ask students to collect any flash cards or cut out pictures of any living things they can find in magazines and papers.
- Sign up onto Brain Pop ([www.brainpop.com](http://www.brainpop.com)) for limited time access to educational videos, quizzes and other resources. Review the videos on classification and six kingdoms.
- Set up a smart board or projector (if one is available) connected to a computer with broadband connection.
- Print the animal chart from *Classification of animals by their observable features*<sup>30</sup> and photocopy as handouts for each student.

In groups of 4 to 5 students:

- Collate the flash cards or cuttings.
- Divide them into plant and animal groups that they think they belong to.
- Each group presents to the class what living groups they have come up with and what they are represented by.
- Write down on the white board the different living groups identified and stick onto the board the plant and animal pictures of the respective groups.

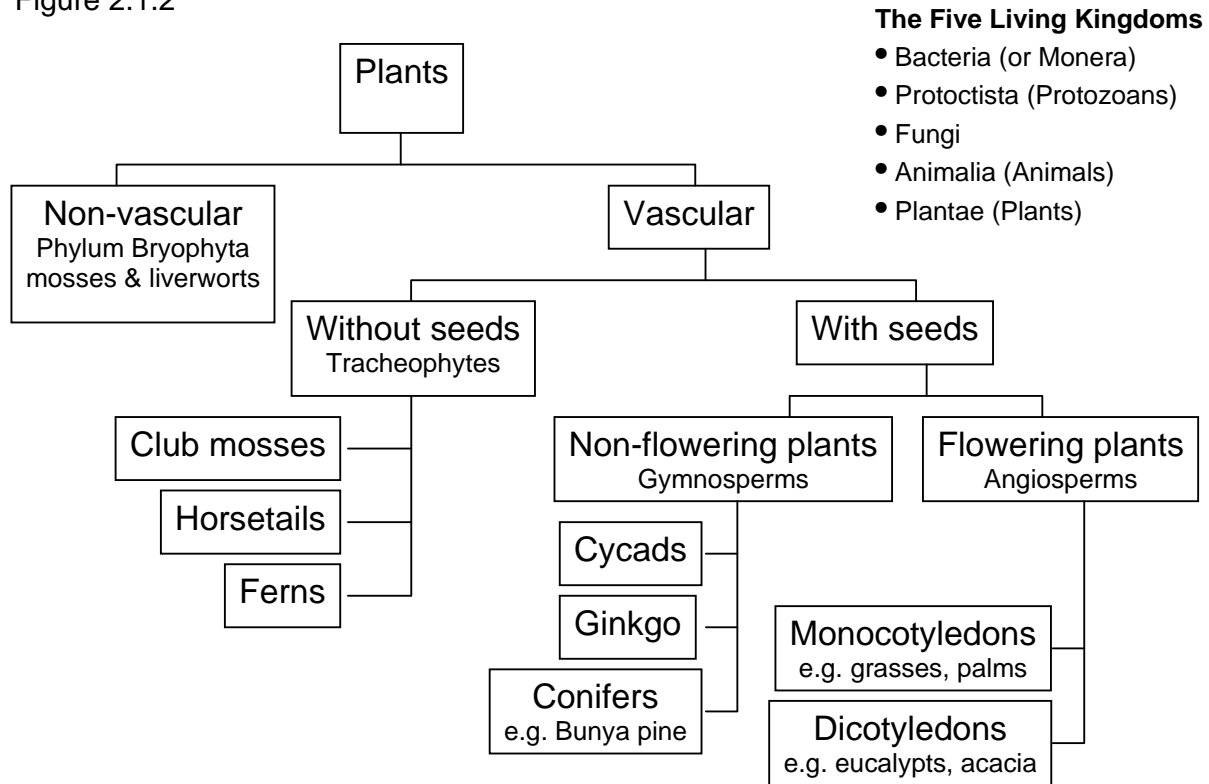
As a class:

- Discuss the criteria they may have used in classifying the organisms (e.g. with shells or not, with legs or not, with fur or feathers, with wings or not, etc...)
- Now distribute the animal chart handouts for all students.
- With the animal chart in hand, compare the living groups and sorting criteria they have used with the chart.
- Discuss what students have learnt through the exercise.
- Watch the Brain Pop video on classification.  
[www.brainpop.com/science/diversityoflife/classification/](http://www.brainpop.com/science/diversityoflife/classification/) (accessed Dec 08)
- Run the Brain Pop quiz to test their learning from the video.
- If interested, introduce the classification of plants, using figure 2.1.2.

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<sup>30</sup> *Classification of animals by their observable features*. Pearson Pub.  
[www.pearsonpublishing.co.uk/education/samples/S\\_493907.pdf](http://www.pearsonpublishing.co.uk/education/samples/S_493907.pdf) (Jan 09) This gives an illustrated chart of the major animal groups, activity sheets and identification cards for invertebrates, insect larvae and mammalian teeth and diets.

Figure 2.1.2



### Related Activities / Resources

*Animal or plant?* Museum Victoria. This explains the five living Kingdoms: Bacteria, Protocista, Animalia, Fungi and Plantae.

<http://museumvictoria.com.au/DiscoveryCentre/Infosheets/Animal-or-plant/> (accessed Jan 09)

Key to the Invertebrates, CSIRO. [www.ento.csiro.au/education/key/couplet\\_01.html](http://www.ento.csiro.au/education/key/couplet_01.html) (accessed Jan 09). This is a simple interactive key for the common invertebrate groups.

*The Plant Kingdom: Simple notes for schools visiting the ANBG*, Australian National Botanical Gardens [www.anbg.gov.au/PLNTKING/httoc.htm](http://www.anbg.gov.au/PLNTKING/httoc.htm) (accessed Dec 08).

*Introduction to botany*, in *Teaching Resources: Native Vegetation*. Waterwatch Adelaide & Mount Lofty Ranges [www.waterwatchadelaide.net.au/index.php?page=education-materials-9](http://www.waterwatchadelaide.net.au/index.php?page=education-materials-9) (accessed Jan 09).

*Wildlife of Greater Brisbane*, 2007, Queensland Museum. This is a good general reference book. [www.qm.qld.gov.au/organisation/publications/guides/wlgb.asp](http://www.qm.qld.gov.au/organisation/publications/guides/wlgb.asp)

### Lesson 2.1.3: What's in a name?

Students learn how plants get their names and what their names might tell them about the plants. Both scientific and common names, including Aboriginal names, will be explored.

#### Key Activities / Resources (at least 1 hour)

Preparation and materials:

- One or more copies of Noosa's Native Plants<sup>31</sup>. Information in this book has grown substantially and is available online as a searchable database. The information includes scientific names, common names (including some aboriginal names), basic descriptions, vegetation types, uses (under cultural notes), Regional Ecosystems (RE), etc.
- Computer stations with access to broadband internet.
- Print out a copy of the Resource Sheet 2.1.3, cut out enough individual names so each student gets either a scientific or a common name (e.g. 24 names from 12 species for a class of 24 students), and mix them up in a box for draw later.
- Sheets of A4 or A3 paper.
- *What Native Plant is That?* Herbarium Plus folder from NICA.

As a class:

- Get each student to draw from the box a plant name.
- Using printed and online references, ask each student to find other names of the plants (e.g. students with scientific names look for their common names, and students with common names look for the corresponding scientific names).
- Once everyone has found the names, ask them to pair up (e.g. student with "*Thysanotus tuberosus*" and student with "Fairies handkerchiefs" pair up).

Students in pairs:

- Carry out research on the plant names they have in hand, using printed and online references. Focus on the following:
  - Do the names refer to particular morphology or qualities (including use) of the plants (e.g. the Handsome flat pea has elongated flat pods, the Sandfly zieria is aromatic and used as a sandfly deterrent)? Are they named after certain people?
  - For scientific names, what do they mean? Are they derived from Latin, Greek or other languages? What families do they belong to? (e.g. *Thysanotus tuberosus* of family Anthericaceae; *Thysanotus* = fringed petals in Greek, *tuberosus* = with tubers)
  - Try look up also names in aboriginal (e.g. Gidee-Gidee for *Abrus precatorius*) languages and LOTE (languages other than English e.g. German, French, Chinese)<sup>32</sup> that the students are learning.
  - Simple descriptions of the plants (e.g. is it a tree, shrub, grass, vine), what are the flowers and/or fruit like? Do they have particular uses to people and animals?
  - Download a couple of photos or drawings of the plants.
- Each student pair prepares a simple poster with the above information and presents it to the class.

<sup>31</sup> Haslam, Stephanie, 2004. Noosa's Native Plants, Noosa Integrated Catchment Assoc. [www.noosanativeplants.com.au](http://www.noosanativeplants.com.au) (accessed Dec 08)

<sup>32</sup> [www.plantnames.unimelb.edu.au/Sorting/List\\_bot.html#sec.02](http://www.plantnames.unimelb.edu.au/Sorting/List_bot.html#sec.02) (accessed Dec 08)

As a class:

- Discuss what they have learnt. Any difficulties in matching the names? They may find many more common names to one scientific name, causing confusion. Emphasize the importance of the binomial scientific names as the only internationally recognized names for species.
- Start a master list of Latin–English translation — the classes' own botanical dictionary.
- Pin up all posters and the master list for display or file into Herbarium Plus.
- Encourage students to investigate the remaining species on the list.

### **Related Activities / Resources**

*Endangered Species: Module Outline for Lower Secondary*<sup>33</sup>, in LOTE (2000) sourcebook modules, QLD School Curriculum Council.

*Identification of local indigenous plants, in Teaching Resources: Native Vegetation.* Waterwatch Adelaide & Mount Lofty Ranges<sup>34</sup>.

Don Perrin, 1988. *Dictionary of Botanical Names*. Published by Don Perrin Bushland Stickers, Kippa Ring.

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<sup>33</sup> QLD School Curriculum Council, 2000. *Endangered Species: Module Outline for Lower Secondary*. LOTE sourcebook modules. [www.qsa.qld.edu.au/syllabus/930.html](http://www.qsa.qld.edu.au/syllabus/930.html) (accessed Dec 08)

<sup>34</sup> [www.waterwatchadelaide.net.au/index.php?page=education-materials-9](http://www.waterwatchadelaide.net.au/index.php?page=education-materials-9) (accessed Jan 09)

**Resource Sheet 2.1.3: Species table**

<i>Acacia complanata</i>	Flat-stemmed wattle
<i>Allocasuarina littoralis</i>	Coastal she-oak
<i>Araucaria bidwillii</i>	Bunya pine
<i>Backhousia citriodora</i>	Lemon scented myrtle
<i>Banksia serrata</i>	Red honeysuckle
<i>Boronia keysii</i> <sup>35</sup>	Key's boronia
<i>Bruguiera gymnorhiza</i>	Orange mangrove
<i>Dianella revoluta</i>	Blue flax-lily
<i>Eucalyptus robusta</i>	Swamp mahogany
<i>Grevillea robusta</i>	Silky oak
<i>Jacksonia scoparia</i>	Dogwood
<i>Melaleuca quinquenervia</i> <sup>36</sup>	Paper-barked tea tree
<i>Melastoma malabathricum</i>	Blue tongue
<i>Pandanus tectorius</i>	Screw pine
<i>Pandorea jasminoides</i>	Bower of beauty
<i>Parsonia straminea</i>	Monkey Vine
<i>Ricinocarpos pinifolius</i>	Wedding bush
<i>Syzygium oleosum</i>	Blue lillypilly
<i>Themeda triandra</i>	Kangaroo grass
<i>Thysanotus tuberosus</i>	Fairies handkerchiefs

Suggested websites:

[www.noosasnativeplants.com.au](http://www.noosasnativeplants.com.au)

<http://www.anbg.gov.au/htdig/>

<http://asgap.org.au>

[www.plantnames.unimelb.edu.au/Sorting/List\\_bot.html#sec.02](http://www.plantnames.unimelb.edu.au/Sorting/List_bot.html#sec.02)

[www.environment.gov.au/erin/documentation/pubs/nomenclature.pdf](http://www.environment.gov.au/erin/documentation/pubs/nomenclature.pdf)

<sup>35</sup> [www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=21632](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=21632) (accessed in Dec 08)

<sup>36</sup> [www.environment.gov.au/cgi-bin/species-bank/sbank-treatment.pl?id=8191](http://www.environment.gov.au/cgi-bin/species-bank/sbank-treatment.pl?id=8191) (accessed in Dec 08)