

Unit 2 Aspects of the plant world 教材分析

資料來源	康軒版自然與生活科技 第五冊	設計者	鄭穎蔚	每週 教學節數	4
		撰寫者	鄭穎蔚	單元教學 總節數	16
教材分析	<p>【植物世界面面觀】 藉由實驗，觀察知道植物主要由根部吸水，並經由莖輸送到其他部位。透過收集，觀察了解植物的根、莖、葉、花、果實和種子，各具有不同的功能，並根據果實和種子的特徵或構造，認識植物的傳播方式與種子和植物繁殖的關係。最後練習用二分法將植物進行分類。</p> <p>1. Part1: Functions of roots, stems and leaves (Feel the interaction between the tree and the environment)模擬大樹活動</p> <p>2. Part2: Plant reproduction (Understand the reproduction of plants through planting)種植活動</p> <p>3. Classification of plants (Learn about the process of making plant taxonomy through knowing Linnaeus)認識林奈</p>				
Part1: Functions of roots, stems and leaves		Part2: Plant reproduction		Part3: Classification of plants	
主要學習內容					
<p>INa-III-9 植物生長所需的養分是經由光合作用從太陽光獲得的。</p> <p>INb-III-7 植物各部位的構造和所具有的功能有關，有些植物產生特化的構造以適應環境。</p>		<p>INf-III-4 人類日常生活中所依賴的經濟動植物及栽培養殖的方法。</p>		<p>INb-III-8 生物可依其形態特徵進行分類。</p>	
主要學習表現					
<p>ai-III-3 參與合作學習並與同儕有良好的互動經驗，享受學習科學的樂趣。</p> <p>ah-III-1 利用科學知識理解日常生活觀察到的現象。</p>		<p>tr-III-1 能將自己及他人所觀察、記錄的自然現象與習得的知識互相連結，察覺彼此間的關係，並提出自己的想法及知道與他人的差異。</p> <p>po-III-1 能從學習活動、日常經驗及科技運用、自然環境、書刊及網路媒體等察覺問題。</p> <p>pc-III-2 能利用簡單形式的口語、文字、影像(例如:攝影、錄影)、繪圖或實物、科學名詞、數學公式、模型等，表達探究之過程、發現或成果。</p>		<p>tc-III-1 能就所蒐集的數據或資料，進行簡單的記錄與分類，並依據習得的知識，思考資料的正確性及辨別他人資訊與事實的差異。</p> <p>an-III-1 透過科學探究活動，了解科學知識的基礎是來自於真實的經驗和證據。</p>	

課程架構

植物世界面觀(Aspects of the plant world)

活動一：植物根、莖、葉的功能

(Part1: Functions of roots, stems and leaves)

1-1 植物體內水的移動(The movement of water in plants)

植物由根部吸收水分，再由莖輸送到葉及其他部位。

(Plants absorb water from the roots, and then transport them to the leaves and other parts from the stems.)

1-2 多功能的根(Root function)

根可以吸收水分和養分，還可以抓住土壤、固定植物身體。

(Roots can absorb water and nutrients, and can also grab the soil and fix the plant body.)

1-3 多功能的莖(Stem function)

莖可以輸送水分和養分，還可以支撐植物身體。

(The stem can transport water and nutrients, and can also support the plant body.)

1-4 多功能的葉(Leaves function)

葉子可以蒸散水分，還可以吸收陽光，製造生物所需養分。

(The leaves can evaporate water and absorb sunlight to produce nutrients needed by organisms.)

活動二：植物的繁殖(Plant reproduction)

2-1 花、果實和種子的功能(Functions of flowers, fruits and seeds)

介紹關於花、果實和種子的功用和各種傳播的方法。

(Introduce the functions of flowers, fruits and seeds and various methods of spreading.)

2-2 植物的繁殖方式(The way plants reproduce)

介紹種子繁殖和營養繁殖。

(Introduction to seed propagation and vegetative propagation)

2-3 蕨類植物的繁殖方式(Propagation methods of ferns)

介紹蕨類植物和孢子繁殖。

(Introduction to ferns and spore reproduction)

活動三：植物的分類(Classification of plants)

3-1 選擇分類標準將植物分類(Choose classification criteria to classify plants)

學習利用二分法來分類植物

(Learn to use dichotomy to classify plants)

Unit 2 Aspects of the plant world

應會認讀/聽懂的字彙

2-1

transport	absorb	evaporate
grow	produce	support

2-2

petal	sepal	filament
anther	receptacle	ovary

2-3

Water cabbage 大萍	sweet potato 蕃薯	water hyacinth 布袋蓮
spanish needles 大花咸豐草	water lily 睡蓮	scaly tree-fern 筆筒樹

應聽懂/說出的科學概念

2-1

1. Roots can absorb water and nutrients, grab the soil and fix the plant body.
2. The stems can transport water and nutrients, and can also support the plant body.
3. The leaves look at evapotranspiration and can absorb sunlight to produce nutrients.

2-2

1. The flower has a _____ structure. (petal 花瓣、calyx 花萼、Stamen 雄蕊、pistil 雌蕊)
2. Ferns use spores to reproduce. 蕨類植物利用孢子繁殖。

2-3

1. Does the _____ grow in the water, or does it not grow in the water?
(Water cabbage / sweet potato / water hyacinth / spanish needles / water lily / scaly tree-fern)

For Further Watching Unit 2

2-1

- [Xylem and Phloem - Transport in Plants](#)
- [Xylem and Phloem - Part 2 - Transpiration - Transport in Plants](#)
- [Xylem and Phloem - Part 3 - Translocation - Transport in Plants](#)
- [FuseSchool](#)
- [Parts Of A Plant](#)
- [Transportation in Plants](#)
- [Biology - Transport of water in plant](#)
- [Evapotranspiration](#)

2-2

- [What is PLANT PROPAGATION?](#)
- [Grow Onion in Water](#)
- [How to Grow Onion with Water](#)
- [Easiest Way to Grow Lots of Sweet Potato Slips](#)
- [HOW TO GROW SWEET POTATOES IN WATER](#)
- [Introduction to Reproduction in Plants](#)
- [How to Grow Red Kidney Beans](#)
- [How to Grow Sweet potato](#)
- [How to Grow Onion in Water](#)

2-3

- [A film about Carl Linnaeus](#)
- [Carl Linnaeus's Systema Naturae](#)
- [Carl Linnaeus's Herbarium Cabinet](#)
- [What is Scientific Racism? - Carl Linnaeus and Taxonomy](#)
- [Carl Linnaeus](#)
- [Carl Linnaeus: Everything you need to know...](#)
- [The work of Carl Linnaeus Primary Science](#)
- [Classification of Living Things](#)

教學活動規劃

週	日期	活動名稱	各節次教學策略	節
6	10/3-10/9	植物的根、莖、葉	設計實驗 / 摘取裝置 / 觀察記錄 / 討論	4
7	10/10-10/16	植物的根、莖、葉	討論根 / 討論莖 / 討論葉 / 習作整理	4
8	10/17-10/23	植物的繁殖	介紹花 / 果實種子 / 設計繁殖 / 蕨類植物	4
9	10/24-10/30	植物的分類	介紹二分法 / 課本討論 / 習作練習 / 素描	4

教學活動設計

教學活動 Teaching activities		教學設備 /資源 Teaching aids/equip ment	時間 (分) Time
中文 In Chinese	英文 In English		
活動一		單槍 學習單	10
一、熱身活動 1.利用學習單的暖身問題，複習之前上課所說的跟、莖、葉的三個功能。 2.透過單字填空，加深對於植物各部位的印象，並朗讀相關的句子，練習「說」的能力。			
二、主要活動 1.將全班學生透過樹的構造分成五組（樹心、跟、莖、葉、樹皮） 2.透過各種情境（吸收土壤的水、微風吹過、大雨、遭受攻擊、鳥築巢、伐木工人伐樹等）讓學生			15
Activity one 1. Warm-up activities 1. Use the warm-up question of the study sheet to review the three functions of heel, stem and leaf mentioned in the previous class. 2. Through Fill in the blanks of the main activity to deepen the impression of each part of the plant, read related sentences aloud, and practice the ability to "speak". 2. Main activities 1. Divide the whole class into five groups through the structure of the tree (tree core, heel, stem, leaf, bark) 2. Through various situations (absorbing water from the soil, breeze blowing, heavy rain, being attacked, birds building nests, loggers cutting trees, etc.) let students feel			

<p>感受一棵大樹的運作，並感受大樹的情感。</p>	<p>the operation of a big tree and feel the emotions of the big tree.</p>		
<p>三、總結 讓學生發表當中的感受。</p>	<p>3. summary Let students express their feelings.</p>		5
<p>第二節課</p>	<p>Second class</p>		
<p>一、熱身活動</p>	<p>1. Warm-up activities</p>		10
<p>1.透過學習單最後三個問題，去深入思考身為一棵樹的感覺，引導學生去愛護大自然。</p>	<p>1. Through the last three questions of the study sheet, students will think deeply about what it is like to be a tree and be guided to care for nature.</p>		
<p>二、主要活動</p>	<p>2. Main activities</p>		20
<p>1.討論紅豆、地瓜和洋蔥選擇一個來種植，並讓學生進行種植的活動。</p>	<p>1. Discuss the choice of red beans, groundnuts and onions to plant and have students do the planting activity.</p>		
<p>三、總結</p>	<p>3. summary</p>		10
<p>透過認識花的構造來認識相關專門的英文單字。</p>	<p>By understanding the structure of the flower, you will get to know the related specialized English words.</p>		
<p>活動三</p>	<p>Activity three</p>		
<p>一、熱身活動</p>	<p>1. Warm-up activities</p>		15
<p>透過完成種植記錄表，討論在種植的過程中，學生們發生的狀況和解決方法。讓學生了解生命成長的過程和產生對於生命的關懷。</p>	<p>Through completing the planting record sheet, students will discuss what happened during the planting process and how to solve it. Students will learn about the process of growing up and develop a concern for life.</p>		
<p>二、主要活動</p>	<p>2. Main activities</p>		10
<p>1.探討並複習二分法。 2.透過圖片認識課本上植</p>	<p>1. To explore and review the dichotomy. 2. Learn the proper names of plants in the</p>		

<p>物的專有名詞。</p> <p>三、總結</p> <p>練習利用分類的英文句子，練習使用英語進行植物的分類。</p>	<p>textbook through pictures.</p> <p>3. summary</p> <p>Practi practiced using English sentences for classification and practiced using English to classify plants.</p>		15
<p>活動四</p> <p>一、熱身活動</p> <p>透過課本介紹林奈的分類法，並藉由分類去認識植物的各種類別。</p>	<p>Activity four</p> <p>1. Warm-up activities</p> <p>Through the textbook, we introduce Linnaeus' taxonomy and use it to understand the various types of plants.</p>		10
<p>二、主要活動</p> <p>閱讀文章「What are the Different Types of Plant Species?」並討論文章中幾個比較常用的植物名稱。</p>	<p>2. Main activities</p> <p>Read the article "What are the Different Types of Plant Species?" and discuss a few of the more commonly used plant names in the article.</p>		25
<p>三、總結</p> <p>複習幾個重要的植物分類的英文單字。</p>	<p>3.summary</p> <p>Review the English vocabulary of several important plant species.</p>		5

The plant world- Functions of roots, stems and leaves

Warmer

1. What is the main function of the root?
2. What is the main function of the stem?
3. What are the main functions of leaves?

Language

transport	absorb	evaporate
grow	produce	support

1. The root can _____ water and nutrients, and grab the soil.
2. The stem can _____ water and nutrients, and _____ the plant body
3. The leaves can _____ water, absorb sunlight and _____ nutrients.

Sentence

1. Roots can absorb water and nutrients, grab the soil and fix the plant body.
2. The stems can transport water and nutrients, and can also support the plant body.
3. The leaves look at evapotranspiration and can absorb sunlight to produce nutrients.

Content

1. Divide the students in the class into five groups.
2. Each group is root, bark, stem (vascular bundle), trunk, leaves, and forms a big tree.
 - The trunk stands in the center
 - The stems stand around the trunk.
 - The bark stands around the stem.
 - The roots and leaves wrap around the bark, the roots sit down, and the leaves raise their hands.
 - To imagine the behavior of the tree according to the instructions.

Thinking

1. What part do you think is the most important?
2. Which part do you think you want to be the most? Why?
3. How do you feel when you were about to be cut down?

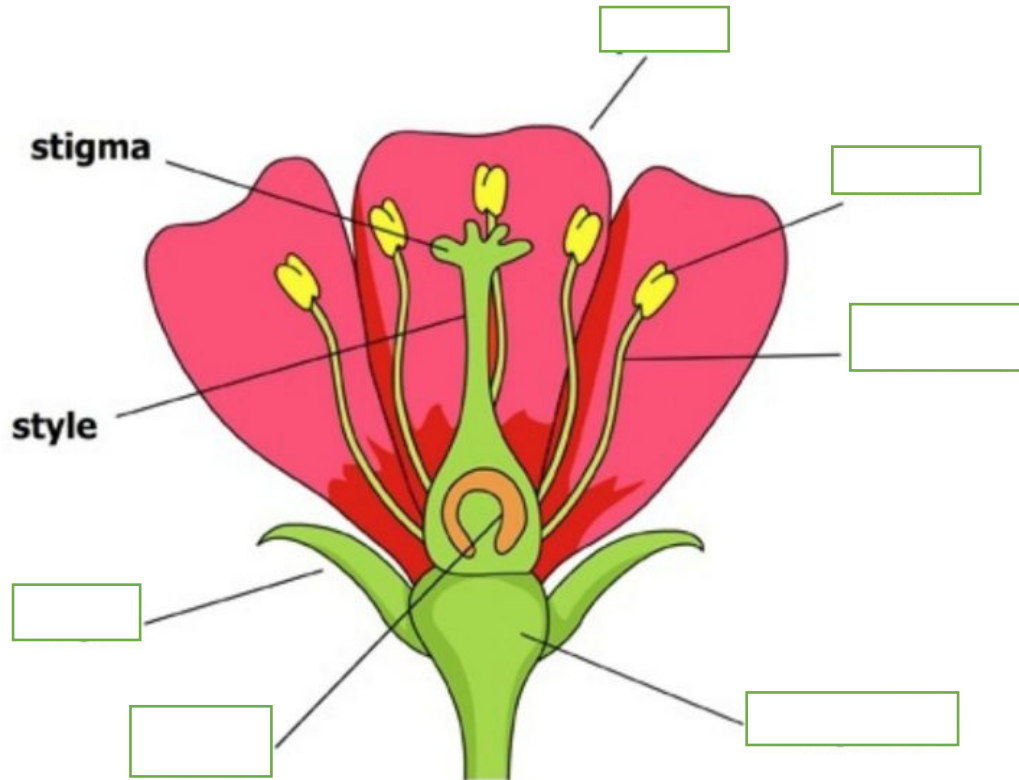
The plant world- Plant reproduction

Warmer

1. Do you want to grow red beans, sweet potatoes, or onions? Why?

Language

petal-	sepal	filament
anther	receptacle	ovary



Sentence

1. The flower has a _____ structure. (petal 花瓣、calyx 花萼、Stamen 雄蕊、pistil 雌蕊)

2. Ferns use spores to reproduce. 蕨類植物利用孢子繁殖。

Content

Vegetables	Directions	Draw after 3 days	Draw after 5 days	Draw after 7 days

Thinking

1. What is the most memorable thing throughout the process?







The plant world- Classification of plants

Warmer

1. What is the dichotomy(二分法)?

Language

Water Cabbage 大萍	Sweet potato 蕃薯	Water Hyacinth 布袋蓮
Spanish Needles 大花咸豐草	water lily 睡蓮	Scaly Tree-fern 筆筒樹

Sentence

1. Does the _____ grow in the water, or does it not grow in the water?

Content

Watch an article of [What are the Different Types of Plant Species?](#)

and discuss the following questions in a small group.

1. In the article, how many types of existing plant species can be divided?
2. Which two plants reproduce by spores?
3. In the article, which is a good place for us to learn about plants?

Notes:

Thinking

K(what I know)	W(What I want to know?)	L(What I learned)

What are the Different Types of Plant Species?

By Diane Goettel

The plant kingdom is a rich and varied world, with species such as green algae that grow on the microscopic level as well as monstrously large, imposing beauties like the giant redwood trees. Botanists, who study plant species, have identified more than 300,000 species of plants that presently exist. The existing species can be broken down into a few groups, including bryophytes, ferns, fern allies, and seed plants.

As with species in the animal kingdom, the species that currently exist within the plant kingdom represent only a fraction of those that have existed on the planet Earth. Archeologists and geologists regularly discover fossils that attest to the fact that there were plants on this planet that no longer grow anywhere known to humans.

Bryophytes are a group that contain plant species that do not flower and do not produce seeds. These kinds of plants reproduce themselves through spores. A common type of bryophyte is moss.

Seed plants, which are also referred to as "spermatophytes," reproduce by producing seeds. Flowering plants and conifer trees are examples of this type of plants. Many fruits and vegetables are also part of the seed plant variety.

Ferns, like bryophytes, reproduce via spores. The thing that makes this type different from bryophytes is that the plants within it have a vascular structure, meaning that they have a xylem and a phloem. There are about 12,000 species within the fern grouping. The term "fern ally" refers to a group of plants that also reproduce via spores and have vascular systems but are not true ferns.

A brief sketch cannot in any sense capture the breadth and variety of the many mosses, ferns, flowers, trees, lichens, shrubs, algae, and grasses that currently live on planet Earth. This subject has been of great fascination to scientists of various stripes for thousands of years. One of the best places, other than the world beyond the front door, to get a sense of the many species of plants on the planet is at a natural history museum. Another very interesting and beautiful resource for information about plants is a book called *Das Naturalienkabinet* or *Cabinet of Natural Curiosities*, which is a compilation of the color plates illustrated via commission by a man named Albertus Seba.

Source of information : <https://www.allthingsnature.org/what-are-the-different-types-of-plant-species.htm>