Researchers in Schools

How to grow a plant library and ways to name plants

Key Stage 3 Programme

Pupil Name	
Coursebook Designed by	Dr. Alexander

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Timetable and Assignment Submission

Timetable – Tutorials

Tutorial	Date	Time	Location
1			
2			
3			
4			
5			
6 (Feedback)			
7 (Feedback)			

Timetable – Homework Assignments

Homework Assignment	Description	Due Date
Tutorial 1	Baseline Assessment	
Tutorial 2	Creating a classification system	
Tutorial 3	Making a herbarium specimen	
Tutorial 4	Creating a dichotomous key	
Tutorial 5	Draft assignment	

Assignment Submission – Lateness and Plagiarism

Lateness	
Submission after midnight on 9th August	10 marks deducted
Plagiarism	
Some plagiarism	10 marks deducted
Moderate plagiarism	20 marks deducted
Extreme plagiarism	Automatic fail

Course Rationale

Plants are all around us and we rely on them for survival, yet many people do not take notice of them. Being able to identify plants is important and has many applications including agriculture, medicine and understanding the world's biodiversity as well as many others.

This course will open your mind to the fantastic world of plants by understanding their key features and how varied they can be, e.g. from tall Redwood trees to tiny orchids. You will learn:

- How to identify different plants by studying the features of their parts (leaves, flowers, fruits etc.)
- How plants are classified and related to one another
- About how plants are named and understand the rules for naming

Through understanding plant features and how they vary, you will be able to apply your skills to identify plants all around you! This knowledge will also link to why plant identification is so important in everyday life and why people dedicate their lives to it.

Uni Pathways Mark Scheme 2020 – science-based assignments

	Subject Knowledge	Critical Thinking	Written Communication
1st	The work shows a depth of knowledge and understanding of key concepts and scientific methods, through engaging with relevant sources. Knowledge is used to build and support highly effective scientific arguments and explanations.	Analyses key scientific evidence, arguments, and reasoning. Interprets meaning and makes connections. Identifies and critically evaluates key scientific arguments and evidence, deciding on their credibility, strength, and relative significance, drawing convincing conclusions.	The work has a coherent flow and is well structured. The writing style is appropriate; scientific language and key scientific terms are used accurately and effectively to support the arguments and explanations made. There are no, or very few, errors in spelling or grammar. Consistent referencing, appropriate paragraphing and use of correctly labelled tables and graphs matching the style taught in the course.
2:1	The work shows an understanding of key concepts and scientific methods, drawing on relevant sources. Knowledge is used to build and support effective scientific arguments and explanations.	Analyses relevant scientific evidence, arguments, and reasoning. Identifies and critically evaluates relevant scientific arguments and evidence, deciding on their credibility and strength, drawing reasonable conclusions. Shows some understanding of the relative value of evidence and arguments.	The work is well-structured. The writing style is appropriate; scientific language and key terms are used correctly. There are few errors in spelling or grammar. Mostly consistent referencing and use of tables and figures; matching the style taught in the course.
2:2	The work shows an understanding of key concepts and scientific methods, with no major misconceptions. Beginning to apply this knowledge to build and support effective scientific arguments and explanations.	Identifies and uses basic scientific evidence, arguments, and reasoning. Showing some understanding of the quality of scientific arguments and evidence. Not yet showing understanding of the relative value of evidence and arguments.	The work has some structure. The writing style can sometimes be informal; occasionally scientific language and key terms are not used when it would be appropriate to do so. There are some errors in grammar and spelling do not get in the way of communicating the content. Referencing has some consistency; matching the style taught in the course Limited use of tables and graphs.
3rd	Shows a developing understanding of key concepts and scientific methods, with some misconceptions. Does not yet apply this knowledge to build and support scientific arguments and explanations.	Beginning to analyse scientific evidence, arguments, and reasoning. Describes evidence and arguments, while not yet evaluating them.	The grammar, spelling, style, and structure of the work need improving in order to communicate ideas to the reader. Scientific language, key terms and references are not always used correctly. Limited, or no use of tables and graphs.

Baseline Assignment (problem-set): Pupil Feedback Report

Name of Pupil	
Name of School	
Name of RIS teacher	
Title of Assignment	

How your assignment is graded:

Grade	Marks	What this means
1st	70+	Performing to an excellent standard at A-level
2:1	60-69	Performing to a good standard at A-level
2:2	50-59	Performing to an excellent standard at GCSE
3rd	40-49	Performing to a good standard at GCSE
Working towards a pass	0-39	Performing below a good standard at GCSE
Did not submit	DNS	No assignment received by The Brilliant Club

Lateness	
Any lateness	10 marks deducted
Plagiarism	
Some plagiarism	10 marks deducted
Moderate plagiarism	20 marks deducted
Extreme plagiarism	Automatic fail

Marks

OVERALL MARK / 100		FINAL MARK / 100 (including any deductions)	
DEDUCTED MARKS		FINAL GRADE	

If marks have been deducted (e.g. late submission, plagiarism) the teacher should give an explanation in this section:

Mark Breakdown and Feedback

Subject knowledge	
	mark
Critical thinking	
	mark
Written communication	
	mark

Problem Set	
Comment	*mark*

Final Assignment (problem-set): Pupil Feedback Report

Name of Pupil	
Name of School	
Name of RIS teacher	
Title of Assignment	

How your assignment is graded:

Grade	Marks	What this means
1st	70+	Performing to an excellent standard at A-level
2:1	60-69	Performing to a good standard at A-level
2:2	50-59	Performing to an excellent standard at GCSE
3rd	40-49	Performing to a good standard at GCSE
Working towards a pass	0-39	Performing below a good standard at GCSE
Did not submit	DNS	No assignment received by The Brilliant Club

Lateness	
Any lateness	10 marks deducted
Plagiarism	
Some plagiarism	10 marks deducted
Moderate plagiarism	20 marks deducted
Extreme plagiarism	Automatic fail

Marks

OVERALL MARK / 100		FINAL MARK / 100 (including any deductions)	
DEDUCTED MARKS		FINAL GRADE	

If marks have been deducted (e.g. late submission, plagiarism) the teacher should give an explanation in this section:

Mark Breakdown and Feedback

Subject knowledge	
	mark
Critical thinking	
	mark
Written communication	
	mark
Problem Set	
Comment	*mark*

Subject Vocabulary

Word	Definition	In a sentence
Species	A name given to a plant to tell it apart from other plants.	The species name for tomato is *Solanum lycopersicum*. *Lolium perenne* is the grass species that is grown on football pitches
Agriculture	The science or occupation of farming.	The farmer dedicated his life to improving agriculture.
Crop	A plant that is grown as a common food source.	Rice the main crop grown in Asia.
Food security	Making sure there is enough food for the world's population and future generations.	Food security is important for everyone's survival.
Medicinal compound	A chemical or group of molecules used to treat medical conditions.	Aspirin is an example of a medicinal compound from plants.
Environment	An area of the natural world and the conditions in it.	The flower grew in the perfect environment, with enough light and water.
Ecosystem	A natural environment where plants and animals live together.	The rainforest is a diverse ecosystem with many plants and animals living together.
Conservation	The protection of animals, plants, and natural resources.	Through conservation we can save areas where species may be going extinct.
Biodiversity	The many kinds of plants and animals found in an environment.	A region with many plant and animal species has a high biodiversity.
Specimen	A plant that has been dried and pressed as an example of a particular species.	I collected a specimen of sweet pea when visiting my gran's garden.
Herbarium	A plant library of specimens that are used to compare and identify species or keep examples of new species.	The largest herbarium in the world is at the Royal Botanic Gardens, Kew, in London
Linnean system of classification	A way to group species created by the taxonomist Carl Linnaeus	Plant species are grouped according the to the Linnean classification system.

Taxonomy	The process or system of describing the way in which different living things are related by putting them in groups	Botanists use taxonomy to group or separate plant species.
Diagnostic feature	A feature of a plant that helps easily identify it and distinguish it from others	The multiple rows of petals in roses is a diagnostic feature for the species.
Anatomical traits	Important plant features that are not visible to the naked eye, so we need to use a microscope to see them	Pollen is an anatomical trait as it is too small to see with the naked eye. Some hairs on leaves are very small and can be important anatomical traits.
Hierarchical	A system in which people or things are placed in a series of levels with different importance or status	Plants are organised into a hierarchical system, e.g., many species included in a genus.
Binomial name	A species name made up of two parts – the genus name and the species name	The binomial name of a pea is *Pisum sativum*. *Pisum* is the genus name and *sativum* is the species name.

Launch Event

The launch event is your opportunity to learn more about this course and Uni Pathways. You will watch some videos, listen to your teacher and have some discussion. Below is some room to make notes for some of the videos you will watch during the event.

Virtual Campus Tours

Notes…

The Scholars Programme Alumni

Notes…

Student Ambassadors

Notes…

Tutorial 1 – Introduction into plant identification

In this tutorial we will start looking at the way plant species are identified and classified. We will also work through the structure of the Uni Pathways tutorials and what we will be doing for the next few weeks.

What is the Purpose of Tutorial 1?

- Objective 1: To recall the structure of the Uni Pathways tutorials.
- Objective 2: To know the key features used to identify plants.
- Objective 3: To be able to explain what classification is.

How do we tell plant species apart?

Looking at the pictures below, can you name the two plants?

How did you recognise these what the names of these plants are? Using the post-it notes provided, can you make notes on any differences or similarities you see between the two plants? (*hint: remember to refer to the different plant organs).

You may use the space below to make additional notes

Plant identification

To distinguish species (tell them apart) we use many different plant features, including the leaves, flowers and fruit.

Leaves
Leaves are the most useful plant organ to identify species. We use the different features of the leaves, such as the shape, colour, texture (hairy or smooth), the margin, the arrangement of the leaves on the stem and many others to identify species.

Flowers
Flowers vary in shape, size, colour and arrangement and is often the first feature used to identify species. However, it is important to remember that we can only use this feature when the species is in flower (flowers are only in bloom for a short period of the year).

Fruit
There are many different types of fruit, and they are named according to how they develop

Habit
Plants grow in different ways and sometimes closely related species grow differently which helps us tell them apart.

Leaves, flowers, fruit and habit are the most common features used to identify and distinguish species, however, some plant groups have very specific and sometimes unusual features that are used to identify them. An example of this is the spurge plant family (Euphorbiaceae) which releases a milky sap when the stem or branch is broken. Some important features are not visible to the naked eye and so we need to use a microscope to see them, these features are called **anatomical traits.**

Please use this space to make additional notes on using plant organs to identify species.

Activity 1

You have been given cut-outs of five shapes. With your partner, discuss and decide how you will group these shapes. Make notes on why you think the particular shapes belong together or be separated (be ready to share this with the group). There is no right or wrong way to do this – just remember you will need to be able to explain your reasoning (why you have chosen your groups).
[3 min]

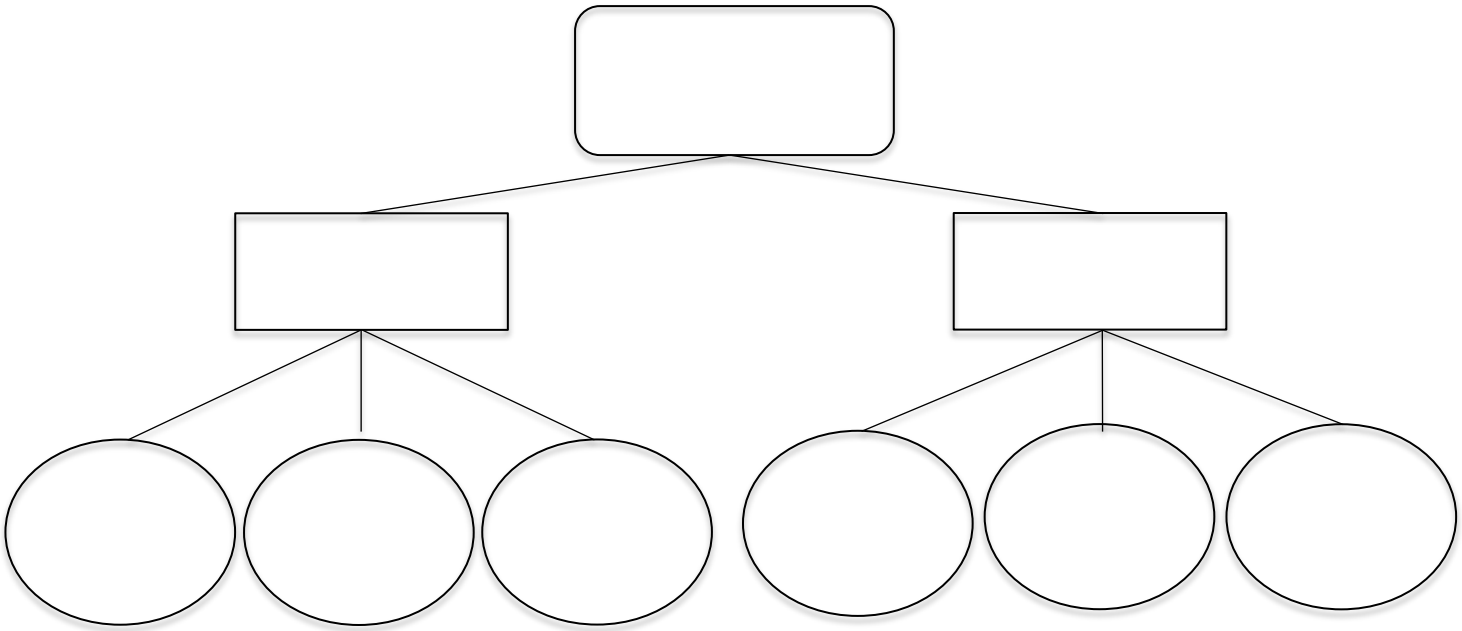
Classification

The process of classification is a way of grouping things or people based on similar features. Classifying thing helps us focus our research on particular groups and allows us to compare groups. Things are classified based on structure or characteristics.

Please use this space to make notes on classification. **Think about why it would be useful to classify plants into groups.**

Activity 2

Using the ideas of classification discussed, please try group the objects and decide which level of classification they fall under. Complete the diagram below, filling in the labels for each item and where they belong.
[5 min]



Biscuits

Chocolate

Cake

Apples

Food

Fruit

Oranges

Strawberries

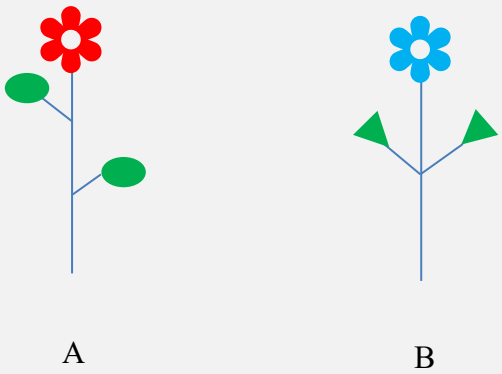
Sweet treats

Baseline assignment question:

How do you tell plant species apart?

Details of the assignment:

1. How are plant species classified?
   What do you think makes a plant a new species?
   What do you think would be the process followed when describing a new plant species?
2. a. In the diagram below, there are two plant species, A and B, what features would you use to distinguish the species from one another?
   b. Are there any similarities between species A and B?



3. a. Why do you think it important to identify plant species?
   b. What would be the practical applications (*hint: every-day uses) of being able to distinguish plant species from one another?

Success criteria – how to structure your assignment and what to include:

Your assignment should be structured and ordered following the questions above. Please answer each question as a paragraph with a logical order and your reasoning should be justified (*hint: for every answer provide a reason). Your answers should be written as full sentences and using scientific terminology where possible. Below are some tips and sentences starters to help you answer the questions.

Question 1: you can start with your answer with the following sentence: "Plants are classified, or grouped, using…". Your answer for question 1 should be around 200 words.

Question 2: You may find it helpful to first draw a table with similarities and differences of the two species and then write your answer in a paragraph using the table as a guide. **Remember to correctly name the different plant organs.* Your answer for question 2 should be around 100 words.

Question 3: you can start question 3b with the follow sentence: "Some of the every-day uses of plant identification are…". Your answer for question 3 should be around 200 words

Tutorial 2 – Why is it important to identify and classify plants?

In this tutorial we will learn at why plant identification is important in every-day life by looking at some examples of where plant identification is used. We will then look at the classification system used to group plants (and all organisms) and learn about the person who created the system, Carl Linnaeus.

What is the Purpose of Tutorial 2?

- Objective 1: To recall practical applications of plant identification.
- Objective 2: To be able to describe the Linnaean system of classification.
- Objective 3: To critique the use of Linnaeus' classification system.

Plant identification

There are several applications of plant identification, that are used every day. Some of these uses can be included in the following categories:

Agriculture
Plant identification is important in farming; for instance, for farmers to check they have been given the correct seed to plant their crops. It is also important for livestock farmers in case their animals eat poisonous weeds.

Medicine
Some plant species have special medicinal properties that are used to treat medical conditions, e.g., aspirin from willow bark. It is important to not only be

able to correctly identify these species to harvest these medicinal compounds, but also to distinguish them from similar looking species as not all related species have the same compounds.

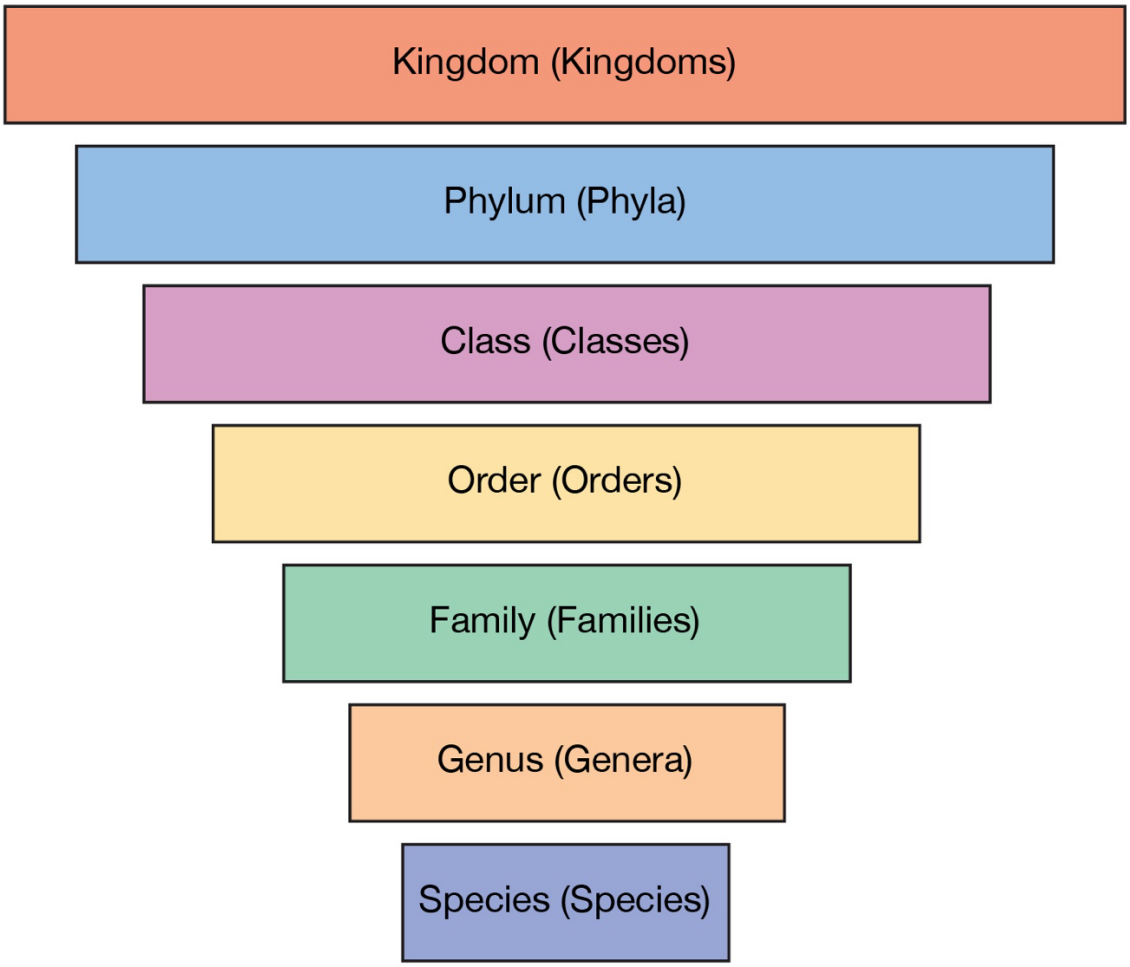
Biodiversity
To have an inventory (a complete list) of species that occur in an area, we need to be able to identify and distinguish all species in the area. By creating an inventory, we are also able to uncover new undescribed species. This is important for conservation as we cannot protect what we don't know exists.

Please use this space to make notes on plant identification.

Linnaean Classification System

As we have learnt in tutorial 1, classification is useful to study things which contain many different types and are grouped using structures or characteristics, for example, living organisms. There are thousands of living organisms in the world, and without a structured classification system, it would be impossible to study them all at once. We use the classification system to create manageable groups so we can focus our studies and comparisons.

The Linnean classification system is a **hierarchical** system with a series of levels, some of which are more important. The system was created by Carl Linnaeus in the eighteenth century to classify all living organisms.



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We name and refer to species using their **binomial name** which is made up of the genus and species, e.g. humans = *homo sapiens*.
***remember that when writing a species name, the name should always be in underlined (or italics if typed).**

Please use this space to make notes about the Linnean system of classification.

Each living organism is classified using this system. Let's work through the classification for a poppy:

Kingdom _____

Phylum_____

Class_____

Order _____

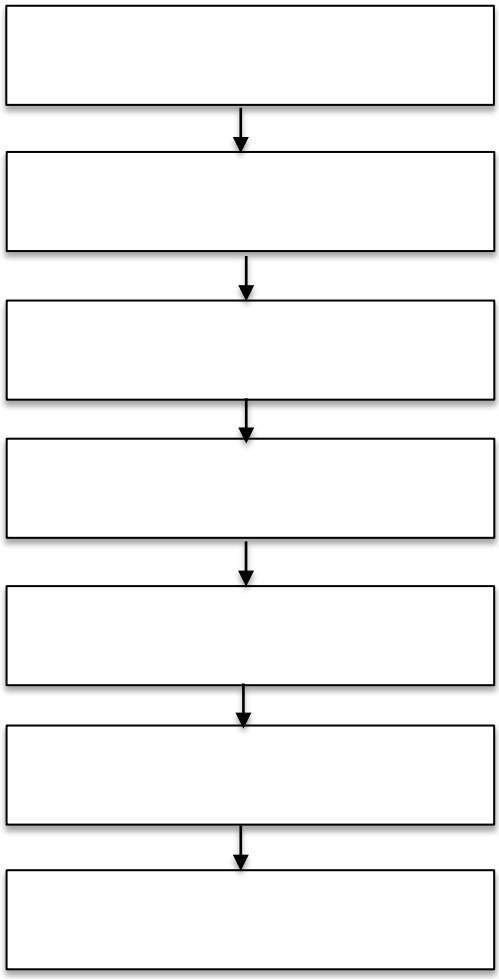
Family _____

Genus _____

Species _____

Activity 1:

Complete the boxes using the labels on the right in the correct hierarchical order of classification.



Family

Kingdom

Order

Class

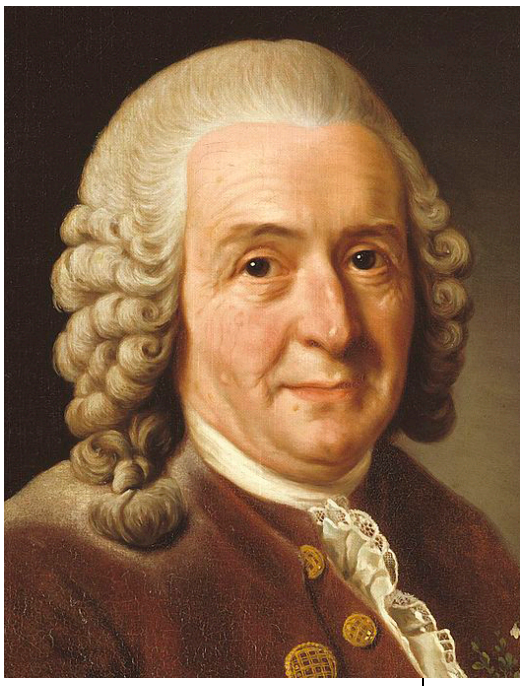
Genus

Species

Phylum

Decolonising classification

Although we use Carl Linnaeus' classification systems it is important to note that his thinking was sometimes problematic. As part of his classification system, he classified human races and positioned white Europeans above BIPOC groups. These classifications have become a paradigm for later racist thinking.



Activity 2:

Given the information about Carl Linnaeus and his classification system, write down your thoughts on whether we should continue using his classification system.
What are the advantages or disadvantages of using the current Linnean classification system?

Homework

Based on what you have learnt about classification systems and our discussions in the tutorial, create your own classification system for living organisms. Think about the questions below when creating your classification system:

What are the key features that you would use to group your organisms?

How many groupings will you have?

How will your classification system deal with new organisms that are not yet classified?

Success criteria	
In this homework, show me that you **understand**: • What hierarchy is • How classification is used to group living organisms	Show me that you **are able to**: • Demonstrate a high level of knowledge and understanding • Problem-solve using a logical scientific approach • Use scientific reasoning to justify your approach

Tutorial 3 – What is a Herbarium specimen?

In this tutorial we will look at what herbarium specimens are, how they are made and where they are kept. We will also touch on why they are important and how they are used.

What is the Purpose of Tutorial 3?

- Objective 1: To recall what a herbarium specimen is.
- Objective 2: To discuss the importance of a herbarium .
- Objective 3: To be able to produce a herbarium specimen.

What is a specimen?

In order to identify a plant species, we need a reference to compare against. Scientists collect examples of species in the field to use as a reference – these examples are called **specimens.** A **herbarium specimen** is *a plant that has been dried and pressed as an example of a particular species*.

Specimens show the important features needed for identification, such as leaf shape, flower size etc. Some features may not be visible from the specimen, e.g. the height of the plant, where it is growing and flower colour (colour often fades) – for these features it is important to make notes so that they can be recorded on the specimen for future use.

Please use the space below to make notes on what a specimen is.

Activity 1: Think, pair, share:

Discuss with your partner the process you would follow when collecting a plant species in the field to make a herbarium specimen.

What is a herbarium and why are they important?

A herbarium can be thought of as a plant library as they house (keep) reference collections of plant species from across the world. The specimens in the herbarium are stored, catalogued and systematically arranged (according to evolutionary relationship). When botanists want to identify species, they take their unknown plant into the herbarium and compare it against all the other species in the herbarium.
The oldest herbarium in existence is in Bologna, Italy dating from around 1532, while one of the largest herbaria (plural for herbarium) is the Royal Botanic Gardens, Kew which contains representatives of nearly 95% of the world's plant species.

Decolonising the herbarium
The vast collections housed in the herbarium in Kew are impressive, but it is also important to note that many of these species were collected during the British Empire. Collectors from this era relied heavily on local resources, often claiming to 'discover' new species which were well-known to locals. The local people were never given credit for their knowledge and assistance.

Please use the space below to make notes on herbaria.

Why are herbaria important?

We have already discussed why it is important to identify and classify plant species in the previous tutorials. Herbaria (plural of herbarium) are vital to plant identification as without the herbarium specimens as a reference, scientists would not be able to identify species. Therefore, a herbarium is important for the same reasons that plant identification is important (agriculture, biodiversity, medicine etc.) as they house all the specimens used in plant identification.

Activity 2: MWB
Answer the questions on the screen using your mini whiteboard

How to make a herbarium specimen

Activity 3: Stop & Jot
How would you go about making a herbarium specimen?

- How would you choose and collect the plant species?
- How could you preserve the plant so it will not rot?
- What important information would be useful to note?

Steps for making a herbarium specimen:

1. Find and select plant species in the field to collect

2. Before collecting species, photograph the species and make a note of any important features (e.g. height)

3. Carefully collect plant species without damaging the plant organs

4. Layout species between two sheets of newspaper to dry and press using a plant press

5. Dry plant for a week, checking for rot or mould every second day and making sure the newspaper is dry

6. Remove preserved specimen from the press (can freeze for two days if possible).

7. Prepare specimen for mounting by carefully laying on mounting cardboard and then mount using tape and glue

8. Create a label for the species with important information:
Species name, collector, date collected, location, other

Homework

Using the method above and the plant you collected during the tutorial, prepare your herbarium specimen. Make sure to dry it correctly and then mount it using the material provided.

Success criteria	
In this homework, show me that you **understand**: • What a species is • What a specimen is	Show me that you **are able to**: • Able to follow a scientific method

Tutorial 4 – Using plant features for identification

What is the Purpose of Tutorial 4?

- Objective 1: to describe the specific features of the different plant organs that are used in plant identification.
- Objective 2: to know what a dichotomous key is.
- Objective 3: to be able to use a dichotomous key to identify a plant species.

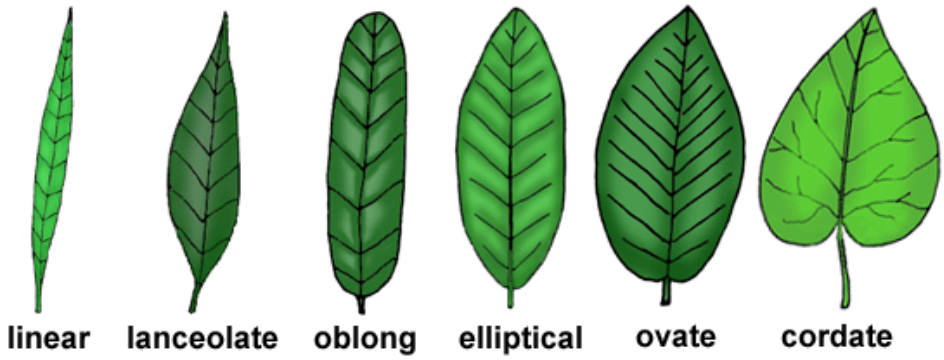
Plant features

As we know from previous tutorials, we use the features of plants to identify them, specifically looking at organs such as the leaves, flowers, fruits etc. We are now going to look in detail at the different features these organs have and how we use them.

Leaves

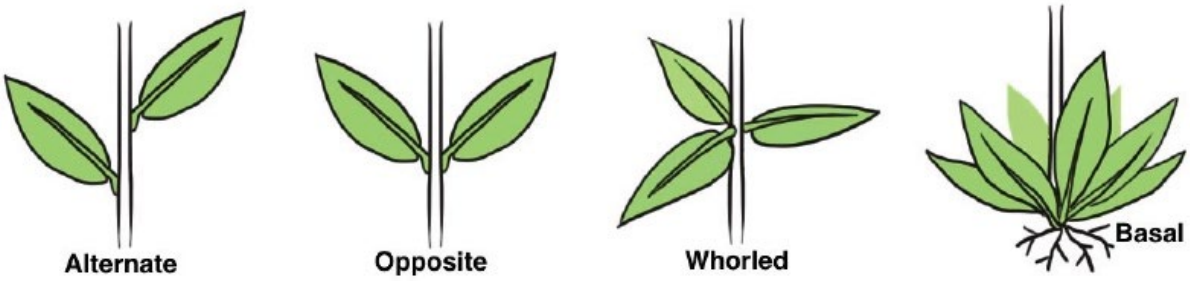
Leaves are the most useful plant organ to identify species. We use the different features of the leaves, such as the shape, colour, texture (hairy or smooth), the margin, the arrangement of the leaves on the stem and many others to identify species.

Leaf shape:



Leaf margin:

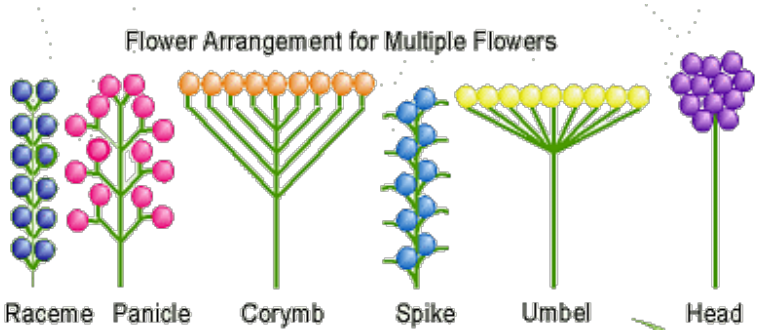
Leaf arrangement:



Use the space below to make additional notes on leaf features.

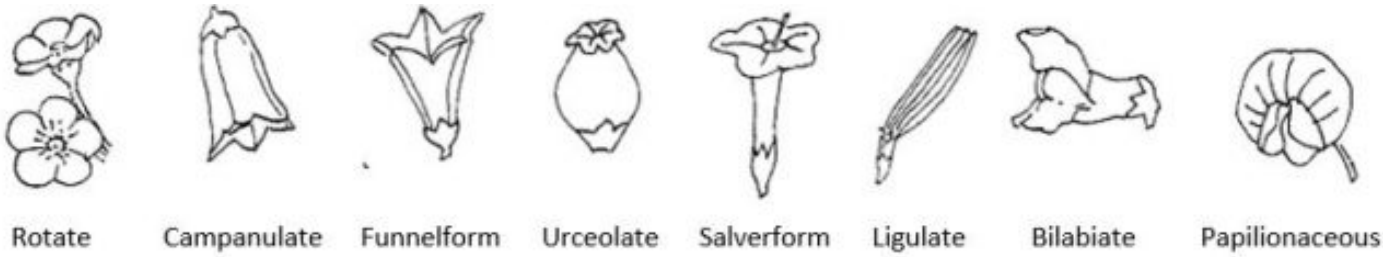
Flowers

Flower colour



Flower arrangement

e.g. of umbel flower arrangement_____



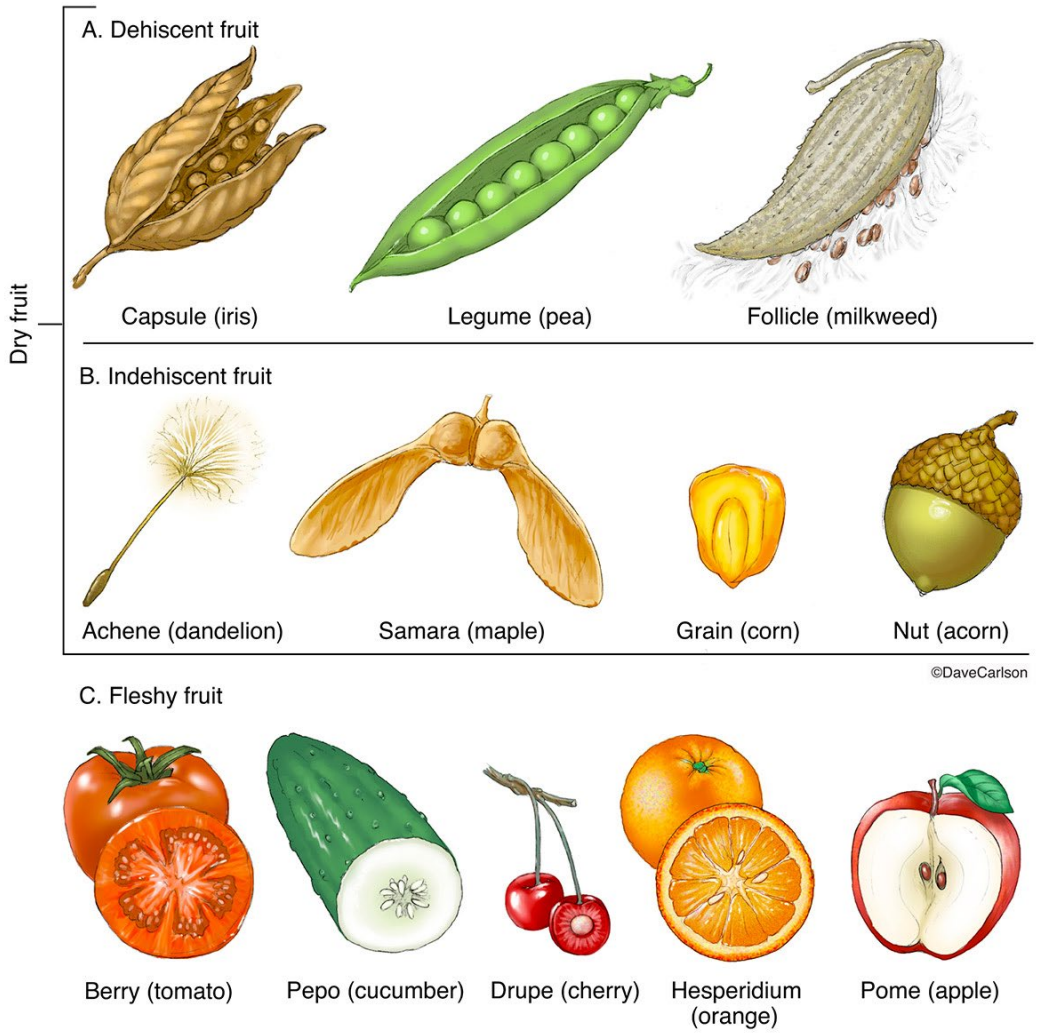
Flower shape

e.g. of a campanulate (bell-shaped) flower _____

Use the space below to make additional notes on flower features.

Fruit

There are many different types of fruit, and they are named according to how they develop



another example of a berry _____

another example of a drupe _____

another example of a pome _____

Use the space below to make additional notes on fruit features.

Habit (the way the plant grows)

Plants grow in different ways and sometimes closely related species grow differently which helps us tell them apart.

Tree

Shrub

Herbaceous

Activity 1: Match up
Match the terms below to the different organs associated with them.

Shrub

Achene

Cordate

Serrate

Raceme

Leaf

Flower

Fruit

Habit

Campanulate

Oblong

Opposite

Umbel

Drupe

Dichotomous key

A key is a tool we use to identify plant species which is usually developed by experts in the group of plants.

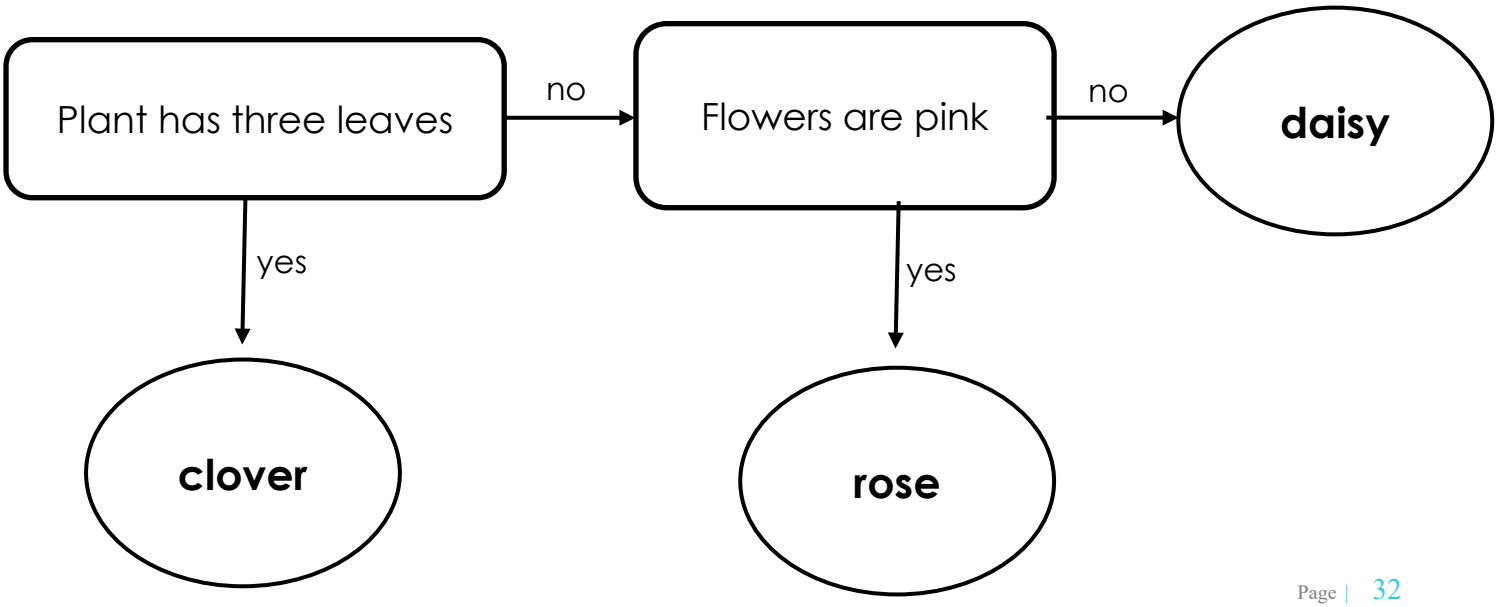
A dichotomous key is a method of identification where groups of organisms are divided into **two categories** repeatedly (*dichotomous = two branching*). We use these keys as they guide the user sequentially, focussing on a specific character of the feature for identification. Dichotomous keys are also beneficial as they only focus on the important features, rather than needing to look at all the features in a species.

Here is an example of a dichotomous key for a rose, daisy, and clover

1a. The plant has three leaves .....clover
1b. The plant does not have leaves 2

2a. The flower is pink..... rose
2b. The flower is white with a yellow centre.....daisy

The format above is the correct way to present a dichotomous, but when developing a key, sometimes it is easier to start as a flowchart as shown below:



Use the space below to make additional notes on dichotomous keys.

Activity 2: Identification using dichotomous key

Using the plant species you have been given, can you identify it using the dichotomous key handed out.

Homework

Using the information you have learnt about a dichotomous key, create a dichotomous key using everyday objects (e.g. shapes, fruit, shoes).

Success criteria	
In this homework, show me that you **understand**: • What different plant traits are and how they are used to identify species. • What a dichotomous key is	Show me that you **are able to**: • Demonstrate a high level of knowledge and understanding • Apply scientific knowledge and ideas

Tutorial 5 – How do we name species

What is the Purpose of Tutorial 5?

- Objective 1: to recall what the abbreviation ICBN represents
- Objective 2: to be able to describe what a type specimen is
- Objective 3: to understand and apply the ICBN principles

We have already learnt how to identify plant species and how they are classified, but today we will be learning how the name of the plant gets decided.

Activity 1: Think, Pair, Share
Imagine you have been given a new plant –in pairs discuss how you will name it. Think about any rules you think may be important. How will you know that all plants that look like that are that species?

International rules of botanical nomenclature (ICBN)

In 1867 the Swiss botanist Alphonse de Candolle published the first international rules of botanical nomenclature, which gave rise to today's International Code of Botanical Nomenclature (ICBN), now in its 13th edition. (There are separate codes governing the naming of cultivars, animals, bacteria, and viruses, each with the goal of assigning each taxon one valid name that is accepted worldwide.)

The ICBN is not a list of plant names, but rather a clarification of the rules and recommendations by which names are assigned, with an appended list of exceptions to these rules. Every six years at an International Botanical Congress (IBC), about 300 botanists and taxonomists convene to hash out proposals for amendments to the rules and argue about plant names.

Use the space below to make additional notes on the ICBN

Activity 2: Match names to plants
Using the cut outs of plant, match the names of the species to the plants. Make notes on your mini whiteboard why you have matched the names to these species.

Type specimens

A type specimen is a specimen selected to serve as a reference point when a plant species is first named. As a result, these specimens are extremely important to botanists who are attempting to determine the correct application of a name. They are often specially curated in herbaria and protected.

Use the space below to make additional notes on type specimens

ICBN Principles

PRINCIPLE I

The nomenclature of algae, fungi, and plants is independent of zoological and prokaryotic nomenclature. This **Code** applies equally to names of taxonomic groups treated as algae, fungi, or plants, whether or not these groups were originally so treated (see Pre. 8).

PRINCIPLE II

The application of names of taxonomic groups is determined by means of nomenclatural types.

PRINCIPLE III

The nomenclature of a taxonomic group is based upon priority of publication.

PRINCIPLE IV

Each taxonomic group with a particular circumscription, position, and rank can bear only one correct name, the earliest that is in accordance with the rules, except in specified cases.

PRINCIPLE V

Scientific names of taxonomic groups are treated as Latin regardless of their derivation.

PRINCIPLE VI

The rules of nomenclature are retroactive unless expressly limited.

These taxonomic rules are called nomenclature.

Activity 3: Apply ICBN principles (Nomenclature)

You have been given some information about different names for the same plant. Apply the ICBN principles to decide which name is the valid name for the type specimen.

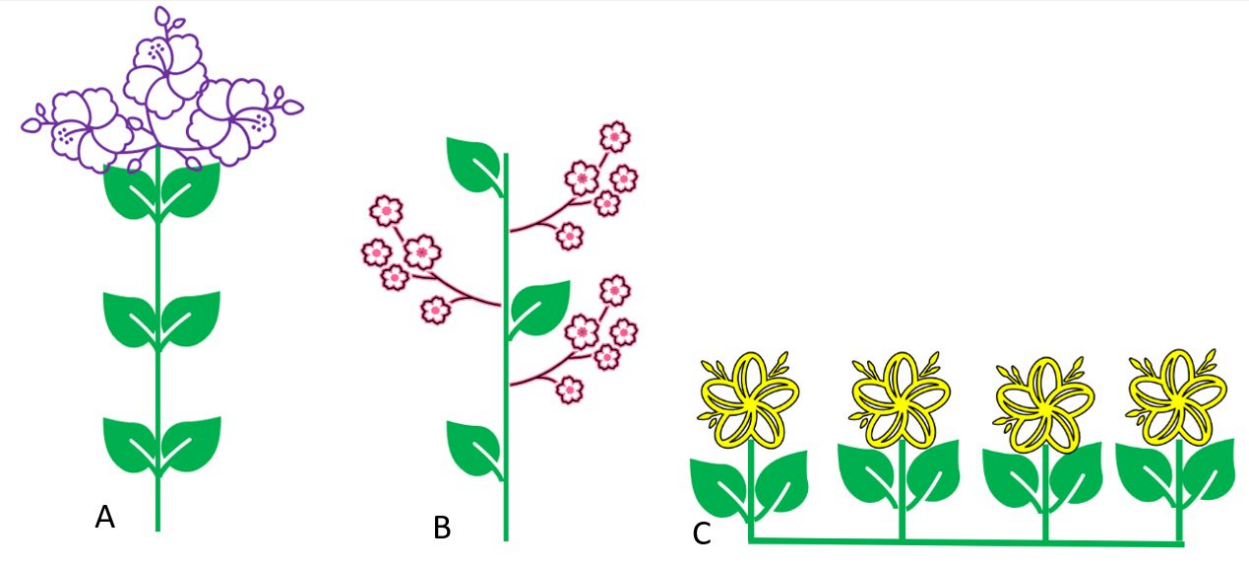
Draft Assignment

At the end of this course, you will need to submit a final assignment. As homework this week, you should prepare a draft of the final assignment so that you can receive feedback on it and improve it for the final submission.

Final assignment question:

How is a new plant species identified?

Details of the assignment:
Imagine you are a plant taxonomist, and you think you may have found a new plant species growing together with two other known species (see figure). How will you decide whether the plant labelled 'A' is in fact a new species? Please justify your answer by describing the process you would follow to determine whether species A is a new species or not. Remember to also compare to the other known species.
[Bonus: what would you name your new species?]



Success criteria – how to structure your assignment and what to include:
Your assignment should follow the logical process from obtaining the plant sample in the field to naming it following the taxonomic laws and principles. Structure your assignment under these subheadings: 1) <u>Comparing species</u>, 2) <u>Describing the new species</u>. Under each subheading, consider including the information on how you would use the tools below:

- **Herbarium specimens**
- **Morphological characters**
- **Nomenclature**

In this assignment, show me that you **understand**:	Show me that you **are able to**:
• The taxonomic rules and principles. • What a species is. • The tools used by taxonomists to identify species.	• Demonstrate a high level of knowledge and understanding • Problem-solve using a logical scientific approach • Use scientific reasoning to justify your approach

Tutorial 6 – Feedback tutorial

What is the Purpose of Tutorial 6?

- To receive feedback on your final assignment
- To respond to the feedback from your Uni Pathways teacher
- To write targets for improvement on your final assignment

Final assignment feedback from your Uni Pathways Teacher

(Remember to look at the mark scheme to help you understand what you have done well so far, and how you can do even better in your final assignment)

Here are three things that my Uni Pathways Teacher thought I did well in my draft assignment
•   •   •

Here are three things that my Uni Pathways Teacher thinks that I could do to get a higher mark in my final assignment
•   •

•

Tasks from my Uni Pathways Teacher to do during the feedback tutorial to help me improve
•   •   •
My response:

Actions I will take to improve my final assignment after this tutorial…
•   •   •

Hand in date for my final assignment:	

Tutorial 7 – Final tutorial

What is the Purpose of Tutorial 7?

- To receive feedback and a grade on your final assignment.
- To reflect on the programme including what you enjoyed and what was challenging.
- To ask any questions you may have about university.

Final assignment feedback from my Uni Pathways Teacher

Final mark:	University style grade:
Feedback: Here are three things that my Uni Pathways teacher thought I did well in my final assignment • • •	

Here are three things that my Uni Pathways teacher thinks I should remember for when I am doing this kind of study in the future
• • •

University

What questions do you still have about University after taking part in Uni Pathways?
•   •   •

Reflecting on Uni Pathways

What did you most enjoy about Uni Pathways?
•   •   •

What did you find challenging about the programme?	How did you overcome these challenges?
• • •	• • •

Appendix 1 – Referencing correctly

When you get to university, you will need to include references in the assignments that you write, so we would like you to start getting into the habit of referencing in your Brilliant Club assignment. This is really important, because it will help you to avoid plagiarism. Plagiarism is when you take someone else's work or ideas and pass them off as your own. Whether plagiarism is deliberate or accidental, the consequences can be severe. In order to avoid losing marks in your final assignment, or even failing, you must be careful to reference your sources correctly.

What is a reference?

A reference is just a note in your assignment which says if you have referred to or been influenced by another source such as book, website or article. For example, if you use the internet to research a particular subject, and you want to include a specific piece of information from this website, you will need to reference it.

Why should I reference?

Referencing is important in your work for the following reasons:

- It gives credit to the authors of any sources you have referred to or been influenced by.
- It supports the arguments you make in your assignments.
- It demonstrates the variety of sources you have used.
- It helps to prevent you losing marks, or failing, due to plagiarism.

When should you use a reference?

You should use a reference when you:

- Quote directly from another source.
- Summarise or rephrase another piece of work.
- Include a specific statistic or fact from a source.

How do I reference?

There are a number of different ways of referencing, and these often vary depending on what subject you are studying. The most important to thing is to be consistent. This means that you need to stick to the same system throughout your whole assignment. Here is a basic system of referencing that you can use, which consists of the following two parts:

1. **A marker in your assignment**: After you have used a reference in your assignment (you have read something and included it in your work as a quote, or re-written it your own words) you should mark this is in your text with a number, e.g. [1]. The next time you use a reference you should use the next number, e.g. [2].
2. **Bibliography**: This is just a list of the references you have used in your assignment. In the bibliography, you list your references by the numbers you have used, and include as much information as you have about the reference. The list below gives what should be included for different sources.

    a. **Websites** – Author (if possible), title of the web page, website address, [date you accessed it, in square brackets].

    E.g. Dan Snow, 'How did so many soldiers survive the trenches?', http://www.bbc.co.uk/guides/z3kgjxs#zg2dtfr [11 July 2014].

    b. **Books** – Author, date published, title of book (in italics), pages where the information came from.

    E.g. S. Dubner and S. Levitt, (2006) *Freakonomics*, 7-9.

    c. **Articles** – Author, 'title of the article' (with quotation marks), *where the article comes from* (newspaper, journal etc.), date of the article.

    E.g. Maev Kennedy, 'The lights to go out across the UK to mark First World War's centenary', Guardian, 10 July 2014.

Notes

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