

## CONTENTS

Outcomes **PACE Planner** Introductory Lesson **PART ONE** What are Plants? **PART TWO** How Plants Work **PART THREE** How Plants Help Us **PART FOUR** Fertilisers

### BLURB

Find out about plants! Discover how plants are classified, what their parts do, how they get food and how they help us. Find out about how plants grow and how we can help them grow. Carry out experiments to discover more about plants.

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		Olvies	
TOPIC OR THEME	LEVEL	CURRICULUM AREA	TEACHERS
PLANTS	2 <sup>nd</sup>	Science	

### **CURRICULUM FOR EXCELLENCE OUTCOMES**

# **ART AND DESIGN**

Though observing and recording from my experiences across the curriculum, I can create images and objects which show my awareness and recognition of detail.

#### EXA 2-04a

I can respond to the work of artists and designers by discussing my thoughts and feelings. I can give and accept constructive comment on my own and others' work.

#### EXA 2-07a

# HEALTH AND WELLBEING

I make full use of and value the opportunities I am given to improve an manage my learning and, in turn, I can help to encourage learning and confidence in others.

#### <u>HWB 2-11a</u>

I value the opportunities I am given to make friends and be part of a group in a range of situations.

#### <u>HWB 2-14a</u>



# **HEALTH AND WELLBEING**

Opportunities to carry out different activities and roles in a variety of settings have enabled me to identify my achievements, skills and areas for development. This will help me to prepare for the next stage in my life and learning.

#### <u>HWB 2-19a</u>

# LITERACY

When I engage with others, I can respond in ways appropriate to my role, show that value others' contributions and use these to build on thinking.

#### <u>LIT 2-02a</u>

I can select ideas and relevant information, organise these in an appropriate way for my purpose and use suitable vocabulary for my audience.

#### <u>LIT 2-06a</u>

When listening and talking with others for different purposes, I can:

- Share information experiences and opinions.
- Explain processes and ideas.
- Identify issues raised and summarise main points or findings.
- Clarify points by asking questions or asking others to say more.

#### <u>LIT 2-09a</u>

I am developing confidence when engaging with others within and beyond my place of learning. I can communicate in a clear, expressive way and I am learning to select and organise resources independently. LIT 2-10a



# LITERACY

Using what I know about the features of different types of texts, I can find, select and sort information from a variety of sources and use this for different purposes.

#### <u>LIT 2-14a</u>

I can make notes, organise them under suitable headings and use them to understand information, develop my thinking, explore problems and create new texts, using my own words as appropriate.

#### <u>LIT 2-15a</u>

To show my understanding across different areas of learning, I can identify and consider the purpose and main ideas of a text and use supporting detail.

#### <u>LIT 2-16a</u>

Throughout the writing process, I can check that my writing makes sense and meets its purpose.

#### <u>LIT 2-23a</u>

By considering the type of text I am creating, I can select ideas and relevant information, organise these in an appropriate way for my purpose and use suitable vocabulary for my audience.

#### <u>LIT 2-26a</u>

I can convey information, describe events, explain processes or combine ideas in different ways.

#### <u>LIT 2-28a</u>



# **SCIENCE**

I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction.

#### SCN 2-01a

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area.

#### <u>SCN 2-02a</u>

Through carrying out practical activities and investigations, I can show how plants have benefited society.

#### <u>SCN 2-02b</u>

I have collaborated in the design of an investigation into the effects of fertilisers on the growth of plants. I can express an informed view of the risks and benefits of their use.

#### <u>SCN 2-03a</u>

By investigating the lifecycles of plants and animals, I can recognise the different stages of their development. **SCN 2-14a** 

I can report and comment on current scientific news items to develop my knowledge and understanding of topical science.

#### SCN 2-20b



# **SOCIAL STUDIES**

By comparing my local area with a contrasting area outwith Britain, I can investigate the main features of weather and climate, discussing the impact on living things.

#### SOC 2-12a

To extend my mental map and sense of place, I can interpret information from different types of maps and am beginning to locate key features within Scotland, UK, Europe or the wider world.

#### <u>SOC 2-14a</u>

# **TECHNOLOGIES**

As I extend and enhance my knowledge of features of various types of software including those which help find, organise manage and access information, I can apply what I learn in different situations.

#### <u>TCH 2-03a</u>

Throughout all my learning I can use search facilities of electronic sources to access and retrieve information, recognising the importance this has in my place of learning, at home and in the workplace.

#### <u>TCH 2-03b</u>

I explore and experiment with the features and functions of computer technology and I can use what I learn to support and enhance my learning in different contexts.

#### <u>TCH 2-04a</u>

I can create, capture and manipulate sounds, text and images to communicate experiences, ideas and information in creative and engaging ways.

#### <u>TCH 2-04b</u>



PURPOSE	ACTIVITIES	CRITERIA	EVIDENCE
<ul> <li>I am developing my understanding of plant species and how they are classified.</li> <li>I am learning about botanists and taxonomists.</li> <li>I am expanding my knowledge on where plants grow and the effect climate has on growth.</li> <li>I am learning about biomes.</li> <li>I am learning about plants in the food chain.</li> <li>I am expanding the way in which I carry out my research.</li> <li>I am learning to speak clearly when reporting my findings.</li> <li>I am learning about the life cycle of a plant.</li> <li>I am discovering how plants help us.</li> <li>I am discovering the different parts of a plant.</li> <li>I am learning about the effects of fertiliser on plant growth.</li> <li>I am learning about fertilisers and the environment.</li> <li>I am learning that experiments can prove or disprove a hypothesis.</li> <li>I am learning how to record the results of an experiment.</li> </ul>	<ol> <li>Complete a worksheet on the classification of plants.</li> <li>Complete a worksheet on plants.</li> <li>Research one of the world's biomes.</li> <li>Complete a worksheet on how plants work.</li> <li>Research a subject based on how plants work.</li> <li>Research a subject based on how plants work.</li> <li>Complete the sock experiment and write a lab report.</li> <li>Research items that come from tress.</li> <li>Draw pictures and write an explanation of four plant products.</li> <li>Complete the paper experiment and write a lab report.</li> <li>Complete the paper experiment and write a lab report.</li> <li>Complete the paper experiment and write a lab report.</li> <li>Complete the fertilisers.</li> <li>Design a poster for an organic or inorganic fertiliser.</li> <li>Complete the fertiliser experiment and write a lab report.</li> </ol>	<ul> <li>I can explain why it is necessary to classify plants.</li> <li>I can compare and contrast the jobs of a botanist and taxonomist.</li> <li>I can present my findings on PowerPoint.</li> <li>I can explain how differing climates affect plant growth.</li> <li>I can work in a group to carry our experiments.</li> <li>I can participate in the completion of a lab report.</li> <li>I can explain what hypothesis means.</li> <li>I can talk about plants in the food chain, seed dispersal, the parts of a plant and its life cycle.</li> <li>I can explain and give examples of how plants help us in our lives.</li> <li>I can discuss the effects that fertilisers have on plants.</li> </ul>	<ul> <li>MAKE</li> <li>Design a poster for an organic or inorganic fertiliser.</li> <li>SAY</li> <li>Verbally present information about biomes.</li> <li>Report findings on how plants work.</li> <li>Report findings on items that come from trees.</li> <li>DO</li> <li>Carry out research using a variety of resources.</li> <li>Carry out experiments and record results in a lab report.</li> <li>WRITE</li> <li>Complete worksheets on the classification of plants, plants, how plants work and fertilisers.</li> </ul>
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# Plants – Introductory Lesson

The purpose of this lesson is to get an idea of what the children already know about the subject. It is a co-operative lesson for the whole class to get involved. Spelling and handwriting are not important.

At the end of the topic it will be useful to re-visit the results of this lesson and hold a class Q&A to discuss what they have found out and any unanswered questions they still have. The Q&A could be part of an ICT lesson where the children research their unanswered questions.

#### SPLIT THE GROUPS

In order to get randomly selected groups ask the children to sort themselves into date of birth order without talking to each other. Then split the children into groups of 4 i.e. the first 4 children are one group etc.

Once in their groups the following jobs should be randomly allocated:

- 1. Group Leader (who likes flowers?)
- 2. Writer (who has the next birthday?)
- 3. Reporter (who has the longest name?)
- 4. Timer (who is wearing red?)

Sheets of A2 paper are laid out on the desks each sheet should be labelled with one of these titles:

- 1. What are Plants?
- 2. How Plants Work
- 3. How Plants Help Us
- 4. Fertilisers

Then split the sheet into two columns:

- 1. What do I know?
- 2. What do I want to find out?

The groups then rotate around each sheet. A time limit should be given.



### What are Plants? TEACHER'S NOTES

Plants are living organisms which include trees, flowers, herbs, shrubs, grasses, vines, ferns, mosses and green algae.

HOW MANY PLANTS? There are around 350,000 living species of plants in the world today. It is difficult to know an exact number because there are new plants to be discovered and plants that have become extinct.

LATIN NAMES Plant taxonomists and botanists often use Latin names to describe plants, e.g. the thistle is known as Cirsium.

#### WHY ARE PLANTS IMPORTANT?

Plants provide food for herbivores and omnivores.

Plants release oxygen as part of the photosynthesis process.

Many animals rely on plants for shelter.

Plant roots play an essential part in soil development and the prevention of soil erosion.

Plant parts can be used to make things that we need in everyday life.

Plants form the basis of many medicines.

Plants are pleasant to look at in your home.

PLANT TAXONOMY A plant taxonomist finds, identifies, describes, classifies and names plants.

BOTANY Botany is the scientific study of plant life. People who study botany are called Botanists. BOTANIC GARDENS You can visit a botanic garden to see a wide variety of plants from all over the world. In the UK there are botanic gardens in Glasgow, Edinburgh, Dundee and Kew. Some botanic gardens employ scientists who research plants.

#### **PLANT CLASSIFICATION**

CLASSIFYING PLANTS Botanists and Plant Taxonomists use complex systems to classify plants. In this section we are going to look at more simple ways to classify plants.

WHY DO WE CLASSIFY PLANTS? We classify plants so we have a clear and organised way of identifying and listing the many thousands of plants in the world.

Gardeners classify plants depending on how long they last.

Perennial	Lasts longer than two years.
Annual	Completes its life cycle in one year.
Biennial	Completes its life cycle in two years.

#### **PLANTS WITH SEEDS**

These plants can be separated into flowering or non-flowering. Flowering plants reproduce using seeds that are enclosed in the flower. Non-flowering plants reproduce with naked seeds which are not enclosed in a flower.

#### **PLANTS WITHOUT SEEDS**

These plants are usually algae, mosses and ferns. They are further classified depending on whether they have roots, partial roots or no roots. These plants reproduce by giving off spores.

PLANTS WITH SEEDS flowering	PLANTS WITH SEEDS non-flowering	PLANTS WITHOUT SEEDS
Daisy	Fir	Mosses
Cactus	Pine	Ferns
Apple Tree	Spruce	Liverworts
You can also class	ify plants more using	these categories.
TREES	SHRUBS	FERNS
FLOWERS	GRASSES	MOSSES
HERBS	VINES	GREEN ALGAE
Ale alle	aller alle	1 🚽 40

### WHERE PLANTS GROW

Different plants grow in different areas, these areas are called biomes. There are many different types of biomes including: grasslands, forest, desert, rainforest, tundra and aquatic. Plants need water, air, nutrients and sunlight to grow and the varying levels of each of these things means that different plants grow in different biomes. In this section we will look at each biome individually and give examples of plants that grow there.

**GRASSLANDS** – large areas are covered in grass with only a few trees. Found in Africa, Australia, South America and India. The temperature is warm or hot with 6-8 months of rainfall each year.

<b>BUFALLO GRASS</b>	FLEABANE		
MILKWEED	CHOCOLATE LILY		
DESERT – covers one fifth of the earth's surface. Rainfall is less than 50cm per year. Found in North Africa, Mexico, Australia and USA. Desert plants are sturdy and can survive on little water.			
<b>ELEPHANT TREE</b>	TUMBLEWEED		

ELEPHANT TREE	TUMBLEWEED
BARREL CACTUS	DESERT LILY

**TUNDRA** – the Arctic tundra expands south from the north pole and the Alpine tundra is land high on mountain ranges. Temperatures are very low with a short growing season.

**WILLOW** 

<b>DWARF TREES</b>	LIVERWORTS
BEARBERRY	ARCTIC WILLOW

FOREST - large areas of land covered with trees. Found in central and western Europe, USA and north Asia. The temperature varies with the seasons. Varied vegetation.

OAK TREES	CARPET MOSS	
MAPLE TREES	WOOD ANEMONE	
RAINFOREST – large areas are covered with trees. Rainforests occur near the equator. The temperature is around 20-25 degrees all year with only two seasons, rainy or dry.		
BROMELIADS	ORCHIDS	
VINES	VENUS FLY TRAP	

AQUATIC – these biomes are found underwater. They can be either saltwater or freshwater. The plants that grow vary depending on the water type and temperature.

LILY PADS	ALGAE
BLACK SPRUCE	SEAWEED

### PLANTS IN THE FOOD CHAIN

Plants are the primary producers in most ecosystems in the world and form the basis of food webs and chains.

Food chains and webs describe the series of events that happen when one organism consumes another in order to survive. Food chains are quite simple but food webs are more complex.

STAGES OF A FOOD CHAIN	DESCRIPTION
PRODUCERS	Producers are the beginning of a simple food chain. Producers are plants and vegetables. Energy comes from the sun and plants make food from that energy.
PRIMARY CONSUMERS	Primary consumers are the next link in the food chain. The primary consumers or herbivores are the plant eaters of the chain, herbivores only eat plants they don't eat other animals.
SECONDARY CONSUMERS	Secondary consumers or carnivores eat the primary consumers, e.g. a zebra would be a primary consumer and a lion would be a secondary consumer. Omnivores are also considered to be secondary consumers. Omnivores eat meat and plants.
DECOMPOSERS or MICROORGANISMS	The last link of the chain are the decomposers or microorganisms. Whenever something that was alive dies the decomposers break down nutrients and return it to the soil. The producers use these nutrients to grow strong. Decomposers or microorganisms include fungi and bacteria.

What are Plants? ACTIVITY 1

Can you classify these plants?

Classify each of the plants in the table as one of the following types:

TREE	FLOWER
HERB	SHRUB
GRASS	VINE
MOSS	FERN

You can work with a partner and use the internet.

PLANT	ТҮРЕ
horse chestnut	
chamomile	
boxwood	
рорру	
crisped pincushion	
dutchman's pipe	
broom fork	
maidenhair	
sycamore	
spinifex	
crocodyllus	
sweet pea	
tulip	
fairy duster	
oregano	
wheat	

Write down three more types of tree:
1.\_\_\_\_\_
2.\_\_\_\_\_
3.\_\_\_\_\_

Write down three more types of flower 1.\_\_\_\_\_ 2.\_\_\_\_\_ 3.\_\_\_\_\_

Write down three more types of herb: 1.\_\_\_\_\_ 2.

3.\_\_\_\_\_

What are Plants? ACTIVITY 1 - ANSWERS

Can you classify these plants?

Classify each of the plants in the table as one of the following types:

TREE	FLOWER	
HERB	SHRUB	
GRASS	VINE	
MOSS	FERN	

You can work with a partner and use the internet.

PLANT	ТҮРЕ
horse chestnut	Tree
chamomile	Herb
boxwood	Shrub
рорру	Flower
crisped pincushion	Moss
dutchman's pipe	Vine
broom fork	Moss
maidenhair	Fern
sycamore	Tree
spinifex	Grass
crocodyllus	Fern
sweet pea	Vine
tulip	Flower
fairy duster	Shrub
oregano	Herb
wheat	Grass

Write down three
more types of tree:
1.\_\_\_\_\_
2.\_\_\_\_
3.\_\_\_\_

Write down three more types of flower
1
2
3



### What are Plants? ACTIVITY 2

### Can you complete this plants worksheet?

Read each sentence	Describe the job of a		
Plants reproduce by spreadi		plant taxonomist.	
Trees are the most common			
Botany is the scientific study			
An annual plant completes in			
All plants have flowers to sp	read their seeds.		
There are around 350,000 species of plants in the world.			
Match the part of the food chain with the example.		Can you unscramble these biomes?	
FOOD CHAIN	EXAMPLE	sdlssgrana	
Producers	Herbivores	drtnua	
Primary Consumers	Carnivores and Omnivores	stfroe	
Secondary Concurrence	Fungi	frnriaeost	
Secondary consumers	rungi	qatcaiu	
Decomposers	Plants	setrde	
the star star	where where where		1 1 10

### What are Plants? ACTIVITY 2 - ANSWERS

### Can you complete this plants worksheet?

Read each sentence	Describe the job of a			
Plants reproduce by spreading	ng seeds or spores.	TRUE	plant taxonomist.	
Trees are the most common	plant in the Grasslands.	FALSE	taxonomist finds. identifies.	
Botany is the scientific study	of plant life.	TRUE		
An annual plant completes it	s life cycle in two years.	FALSE	describes,	
All plants have flowers to spi	read their seeds.	FALSE	classifies and names plants.	
There are around 350,000 sp	pecies of plants in the world.	TRUE		
Match the part of the food chain with the example.		Can you unscramble these biomes?		
FOOD CHAIN	EXAMPLE	sdlssgrana	grasslands	
Producers	Herbivores	drtnua	tundra	
Primary Consumers	Carnivores and Omnivores	stfroe	forest	
Cocondem Concurrent		frnriaeost	rainforest	
Secondary Consumers	Fungi	qatcaiu	aquatic	
Decomposers	Plants	setrde	desert	
the state	where where where		1 1 10	

What are Plants?	TUNDRA	GRA	SSLANDS	DESERT
ACTIVITY 3	RAINFOREST	F	OREST	AQUATIC
Can you research one of these biomes?	TASK			
Your teacher will organise you into groups of 4 using Plant Bingo.	<ul> <li>In your group, research ONE of the biomes listed in the table.</li> <li>Present your research as a fact file. Including –</li> <li>1. The name of your biome.</li> <li>2. Where you can find this biome.</li> </ul>			
<ol> <li>Allocate the jobs:</li> <li>The person with the shortest hair is the team leader.</li> <li>The person with the most brightly coloured pencil is the recorder.</li> <li>The person with the</li> </ol>	<ol> <li>Where you can find this blome.</li> <li>What the temperature range is in the biome.</li> <li>How much rainfall there is in the biome.</li> <li>How much sunlight there is in the biome.</li> <li>What plants grow in the biome.</li> <li>Explain two plants in detail.</li> <li>Explain the effect the climate has on the growth of plants.</li> </ol>			
smallest feet is the		RECORDER	RESEARCH	
<ol> <li>The person with their sleeves rolled up is the reporter.</li> </ol>	Keeps everyone on task.	Takes notes during the research.	Searches for information u the interne	or Tells the class using what you have et. found out.
to the stor		-		1 de 10

# ACTIVITY HINTS AND TIPS

## ACTIVITY 1

Reading / Research

CO-OPERATIVE LEARNING The children are asked to work with partners but you could use larger groups.

#### EXTENSION TASK

The children could find pictures of each of the plants. Each child could be allocated one or two plants to research or draw.

The children could compare and contrast the physical appearance of different types of plants and plants that are in the same category e.g. different types of tree.

### ACTIVITY 2 Reading

CO-OPERATIVE LEARNING The children could work in pairs or as a class to complete this task and encourage discussion about the topic.

EXTENSION TASK The children could make their own true or false statements to test their classmates.

The children could use the internet to research food chains further and explain the role that humans have in the food chain.

### ACTIVITY 3 Research

CO-OPERATIVE LEARNING The children could spend some time discussing how well they worked in their groups. Is there anything they could have done differently? Would they have preferred a different role?

#### EXTENSION TASK

The children could use a world map or Google Earth to find the biome they have been researching.

#### PEER ASSESSMENT

The children could participate in a class discussion, offering positive and developmental feedback on the presentations.

# PLANT BINGO

TREES	FLOWERS	MOSSES	HERBS
ash	rose	sheet moss	parsley
maple	daffodil	cushion moss	thyme
sycamore	marigold	haircap moss	sage
SHRUBS	GRASSES	VINES	FERNS
barberry	bluegrass	ivy	<b>Boston ferns</b>
forsythia	barley	jasmine	holly ferns
hydrangea	pampas	clematis	ostrich ferns

#### Assessment 1

By completing these tasks your teacher can see how much you have learned about plants. You can look back in your jotter to help you answer the questions.

Answer these questions in sentences.

- 1. Parsley, sage and mint are all examples of what type of plant?
- 2. Name three types of tree.
- 3. What is a person who classifies, identifies, describes and names plants?
- 4. Which biome is usually found close to the equator?
- 5. Fairy duster and boxwood are which type of plant?
- 6. What is the name given to plants in the food chain?
- 7. What name do gardeners use for plants that complete their life cycle in two years?
- 8. What type of plants can be categorised as flowering and non-flowering?
- 9. Name one type of plant that reproduces using spores.
- 10. Humans are usually omnivores. TRUE or FALSE?



# Assessment 1 - ANSWERS

Answer these questions in sentences.

- 1. Parsley, sage and mint are all examples of what type of plant?
- 2. Name three types of tree.
- 3. What is a person who classifies, identifies, describes and names plants?
- 4. Which biome is usually found close to the equator?
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- 8. What type of plants can be categorised as flowering and non-flowering?
- 9. Name one type of plant that reproduces using spores.
- 10. Humans are usually omnivores. TRUE or FALSE?

- 1. Herbs.
- 2. Various answers.
- 3. Plant taxonomist.
- 4. Rainforest.
- 5. Shrub.
- 6. Producers.
- 7. Biennial.
- 8. Plants with seeds.
- 9. Fern, moss, algae.
- 10. TRUE.

### **Extension Tasks 1**

These are internet based tasks for early finishers. They can be done on an iPad or a computer.

Use Google Images to find pictures of these plants. Write down whether they are in trees, flowers, shrubs, ferns or herbs.		Use Google Images to find pictures of these biomes.	Visit the websites of these Botanic Gardens: 1. Glasgow Botanic Gardens	
		Tundra		
LABURNUM		Desert	<ol> <li>Royal Botanic Garden, Edinbur</li> <li>Royal Botanic Gardens, Kew</li> <li>Dundee Botanic Gardens</li> </ol>	
FIELD HORSETAIL		Rainforest		
ROSEMARY		Aquatic	1. Collect three leaves.	
ALOE VERA		Forest2. Google the Forestry Con TREE NAME TRAIL to fine		stry Commission's
PEONY ROSE				IL to find out the
SAGE		Grasslands	origins of your l	eaf.
CEDAR		Find out about	LEAF 1	
HONEYSUCKLE		Inverewe	LEAF 2	
		Gardens.	LEAF 3	
IULIP		i weet us your work - @LittleiviooseEd		



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