Level 3 Learning Outcomes & Benchmarks

SCN 3-01a - I can sample and identify living things from different habitats to compare their biodiversity and can suggest reasons for their distribution. Identify living things using biological keys.

- Identifies living things using biological keys. Collects and analyses increasingly complex data and information, for example, temperature and light intensity, to suggest reasons for the distribution of organisms within different habitats.

SCN 3-02a - I have collaborated on investigations into the process of photosynthesis and I can demonstrate my understanding of why plants are vital to sustaining life on Earth.

- Describe the process of photosynthesis (using the word equation) in terms of reactants (raw materials) and products.
- Apply knowledge gained from practical investigations to explain how green plants make their own food in the form of sugars and store this as starch.
- Investigate and present information on how plants help to sustain life, for example, by providing oxygen, food, habitat, raw materials and medicines.

SCN 3-03a - Through investigations and based on experimental evidence, I can explain the use of different types of chemicals in agriculture and their alternatives and can evaluate their potential impact on the world's food production.

- Interprets data and information to establish a link between the use of fertilisers and plant yield and nutrient levels in the soil. Researches an agricultural method, for example, chemical fertilisers, herbicides, pesticides, organic methods, genetic modification (GM) and biological control and evaluates their impact on food production.

NB 2nd level outcomes and 4th level outcomes are at the end of the powerpoint. The assessment target for S2 is LEVEL 3 but some pupils may be "supported" with L2 or "stretched" with L4

An Introduction to the Environment

20/08/2025

Starter:

Write down living things that might live in this woodland ecosystem

Ecosystems

20/08/2025

Learning Intentions:

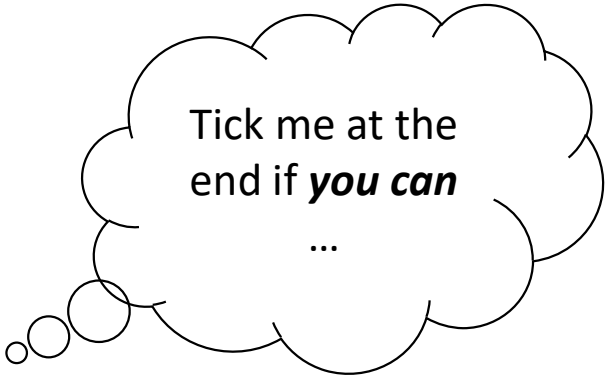
1. To understand and explain what an ecosystem is
2. To define key biological words

Ecosystems

20/08/2025

Success Criteria

- ❑ **I can describe an ecosystem**
- ❑ **I can use the biological words in the word bank**



Word bank

predator	***prey***	***carnivore***	***herbivore***
producer	***consumer***	***habitat***	***population***
ecosystem	***omnivore***	***community***	

SCN 4-01a - I can *use scientific vocabulary such as 'population', 'community' and 'species'.*

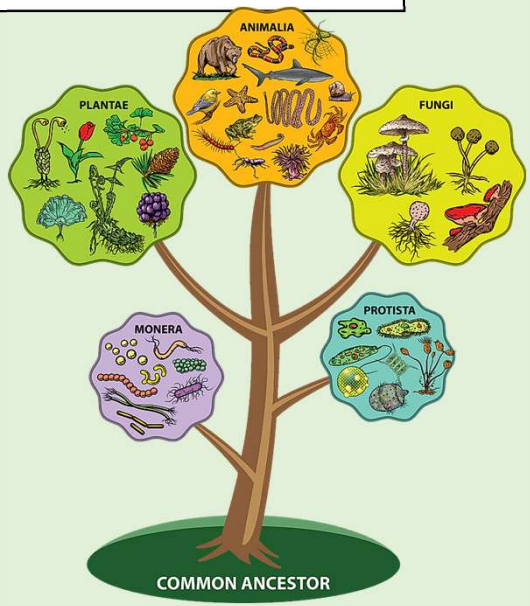
Ecosystems

An **ecosystem** is made up of both _____living_____ and _____non-living_____ parts.

It is made up of a number of _____habitats_____ and _____communities_____ .

Non-living parts might include rocks, air, water or even rubbish!!!

Living parts could include animals, plants, fungi, algae and bacteria!



Ecosystems

A **habitat** is the **place where an organism lives**

A **community** is **ALL** the living organisms that live in a specific **habitat**

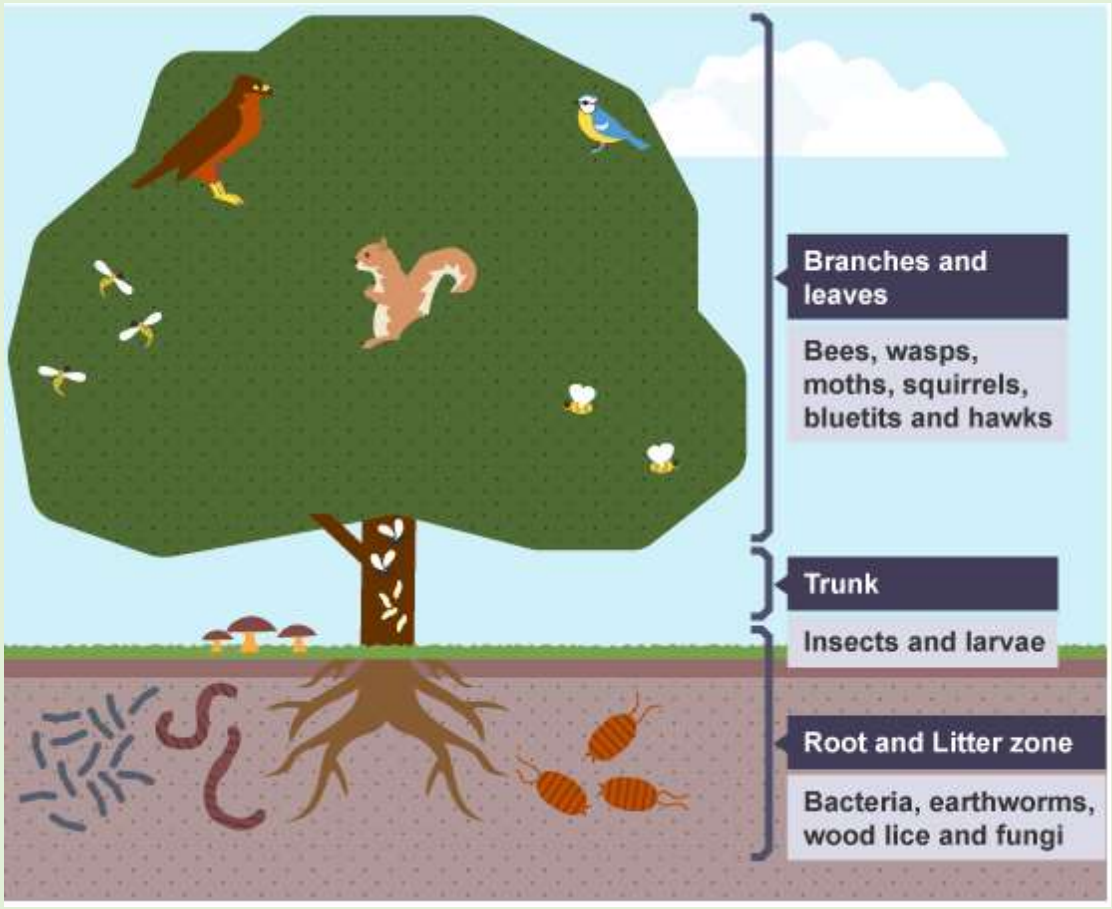
A community contains lots of different species.

Example of an ecosystem

This oak tree is in a woodland **ecosystem**.

Each zone of the oak tree can be seen as a **habitat** for a distinct **community** of organisms.

These organisms could be plants, animals, or even micro-organisms.

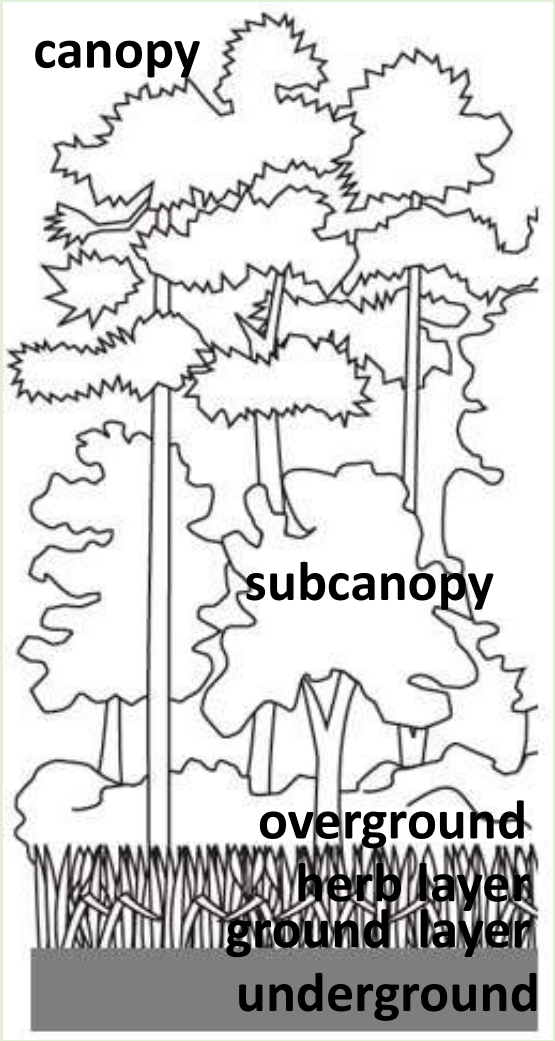


Ecosystems

Video clip

Watch the video clip. **Complete** the table to show one example of a plant and one example of an animal for each layer of the ecosystem.

Layer of Ecosystem	Example of plant	Example of animal
Canopy	oak tree	buzzard
Sub-canopy	holly	small birds
Overground		deer
Herb layer	bluebell	caterpillars
Ground layer	moss	beetle
Underground	plant roots	fox



Other ecosystem examples include…


Forests


Freshwater


Marine


Grasslands


Tundra


Deserts

Ecosystems

Ecosystems are stable if they have large **biodiversity**

This means that there are **lots of different species** living in the ecosystem.

Key biological terms

Key term	Definition
Predator	
	An organism that is hunted and killed
Carnivore	
	An organism that only feeds on plants
Omnivore	
	An organism that produces its own food.
Consumer	
	The place where and organism lives
Population	
	All the living organisms in a habitat
Ecosystem	

Key biological terms

Key term	Definition
Predator	An organism that hunts and kills another organism
Prey	An organism that is hunted and killed
Carnivore	An organism that only feeds on animals
Herbivore	An organism that only feeds on plants
Omnivore	An organism that feeds on both plants and animals
Producer	An organism that makes its own food
Consumer	An organism that gets its energy from eating other organisms
Habitat	The place where and organism lives
Population	All of the organisms of the same species living in a habitat
Community	All the living organisms in a habitat
Ecosystem	A biological unit made up of a number of habitats and communities

MG3

Introduction to the Environment

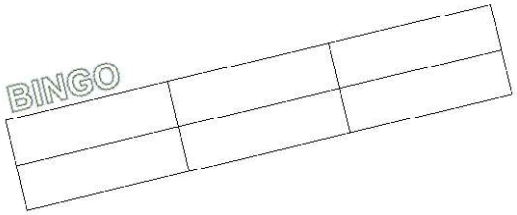
20/08/2025

Page BACK OF BOOKLET

Plenary: BINGO!

<u>Write</u> 6 words from the word bank into the grid at the back of your booklet.

<u>Listen</u> to the descriptions your teacher reads out and cross off the words in your grid. Once you have all crossed off shout BINGO!



Word bank

predator	***prey***	***carnivore***	***herbivore***
producer	***consumer***	***habitat***	***population***
ecosystem	***omnivore***	***community***	

Success Criteria

- ❑ **I can describe an ecosystem**
- ❑ **I can use the biological words in the word bank**

Tick me at the end if ***you can*** …

MG3 USE THE DEFINITIONS ON THE PREVIOUS SLIDE TO CALL THE BINGO!!!

Mrs Gannon, 27/09/2023

HOMEWORK TASK

Page BACK OF BOOKLET

Aim: To produce a poster on a chosen ecosystem:

DESERT or **TUNDRA** or **MARINE** or **FOREST** or **GRASSLAND**

Success Criteria:

- **State WHERE on Earth your ecosystem can be found.**
- **Identify CLIMATE in your chosen ecosystem** ***(temperature range, rainfall, wind speed, etc.)***
- **Identify EXAMPLES of both plants and animals**
- ★ **Comment on the BIODIVERSITY of your chosen ecosystem**
- ★ **Suggest how HUMANS may impact on the BIODIVERSITY of your ecosystem**

SCN 3-01a SCN 4-01a SCN 4-20b

Food Chains

20/08/2025

Starter:

<u>Correct</u> the following statements

1. An omnivore is an organism that eats only plants.
2. A producer gets its energy from consuming other organisms.
3. A population is all the living organisms in a habitat.

Food Chains

20/08/2025

Starter: Did you get any of these????

1. A herbivore is an organism that eats only plants.
   An omnivore is an organism that eats plants and animals.

2. A consumer gets its energy from consuming other organisms.
   A producer gets its energy from the sun.

3. A population is all the living organisms of one species in a habitat.

Food Chains

20/08/2025

Learning Intentions:

1. To describe how energy flows between organisms in ecosystems
2. To construct and analyse food chains
3. To label our food chains with the key terms producer, consumer, herbivore, omnivore, carnivore

Interactions in an Ecosystem

Ecosystems survive through the interactions between plants and animals. Without these interactions, ecosystems risk being broken down.

The interactions between plants and animals in an ecosystem can be displayed using **food chains** and **food webs**.

Video clip

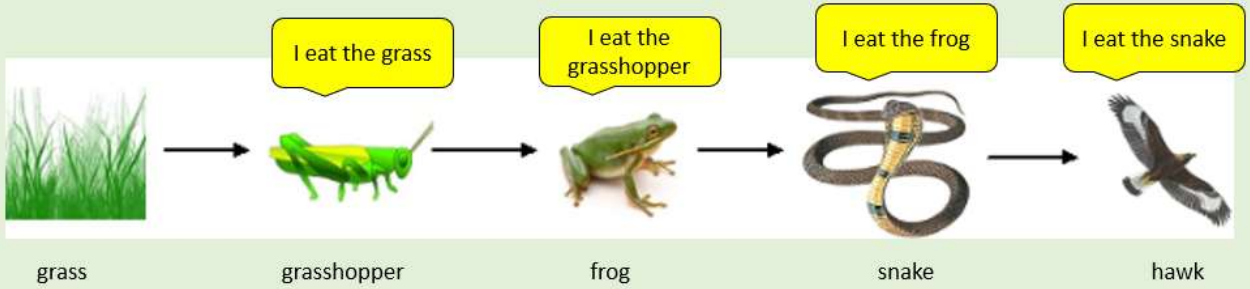
Food Chains Example

The arrows in a food chain show the **direction the energy is flowing**.

For example, energy flows from the grasshopper to the frog.

Food Chains

Plants are known as **producers**. This is because they create their own food using a process called *photosynthesis*. Producers are at the bottom of the food chain and serve as the foundation for all food chains. We always draw the producer at the **start** of our chain.



We will look at photosynthesis later on in this unit

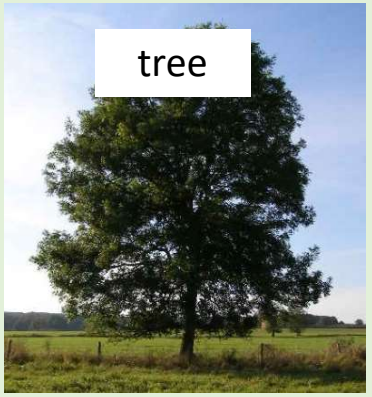
All other organisms in a food chain must eat other organisms to get their energy. They are **consumers**.

EXTRA

- Circle the producer
- Underline the consumers
- Write the name of a predator
- Write the name of a prey species

Producers or consumers

Split the following examples into two groups: producers or consumers



Producers or consumers

PRODUCERS	CONSUMERS
Grass	Sheep
Moss	Fox
Algae	Lion
Tree	Clown fish
Cacti	Sparrow

What do you notice about all of the producers?

Food Chains Example

A food chain shows which **animals** eat each other within an ecosystem. It starts at the beginning with **plants** which are referred to as a **producer** because they make their own food.

The first animal in the food chain only eats plants and so it is referred to as a **herbivore**. The other animals in the food chain that only eat other animals are known as a **carnivore**. The animals, including humans, that eat plants and other animals are known as an **omnivore**.

The animals in the food chain which prey on other animals are called **predators**. The animals that get hunted by the other animals are called **prey**.

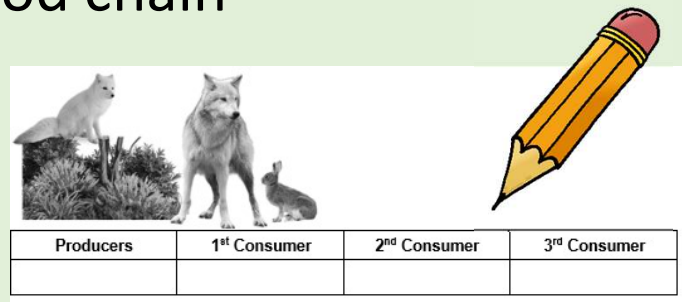
Word bank:
Carnivore/Plants/Predators/Herbivore/Animals/Producer/Omnivore/Prey

Food Chains Example

Arrange the following organisms into a food chain

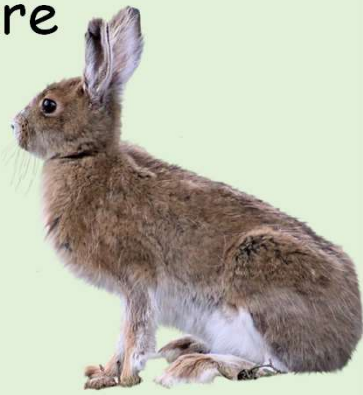
Arctic Fox

Arctic Wolf



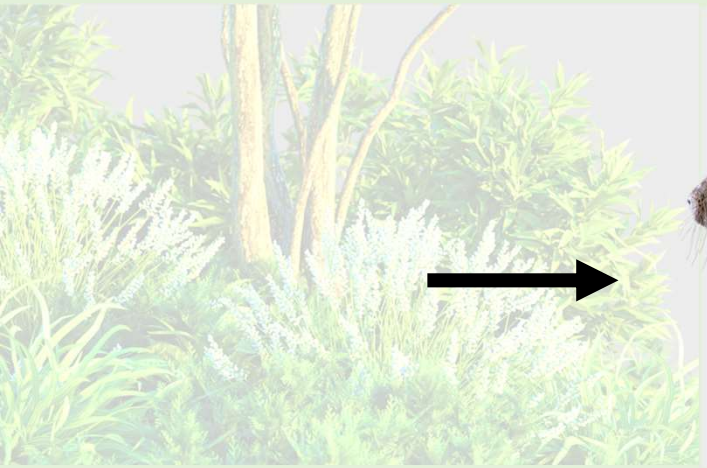
Producers	1st Consumer	2nd Consumer	3rd Consumer

Hare

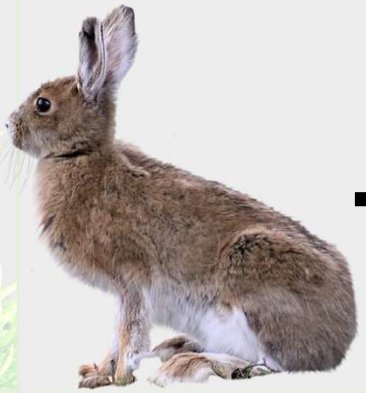


grasses + heather

Food Chains Example

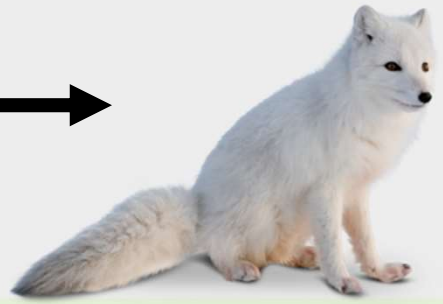


Grasses + Heathers



Hare

The grasses and heathers are eaten by the hare



Fox

The hare is eaten by the fox

Wolf

The fox is eaten by the wolf

More Food Chain Examples

Draw food chains for the following examples:

1. Rat, corn, owl

2. Hawk, grass, snake, mouse

3. Fruit fly, eagle, mango, thrush

4. Crab, killer whale, seaweed, squid, seal

Think:

- Which way should your arrows be pointing?
- What does this represent?

Food Chain Activity

Use the cut outs to create your own food chain.

In pairs, you will need:

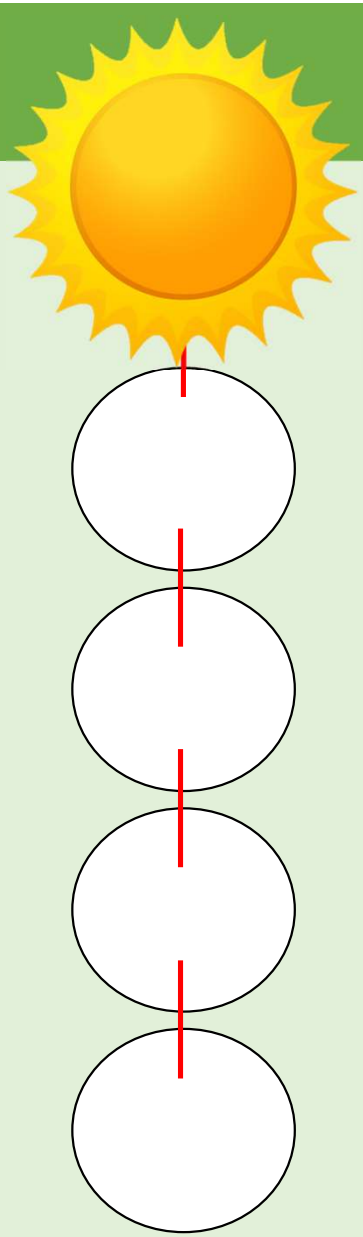
- 1 sun cut-out
- 4 circles
- String

1. Draw a different organism on each of the circles.

2. On the back of each circle, label whether they are a producer or a consumer.

3. Assemble your food chain using string.

4. Challenge: Can you work out if any of your organisms are predator or prey?
   Write this on the back.



Food Chain Plenary

BBC Bitesize food chain challenge.

How many food chains can you find?

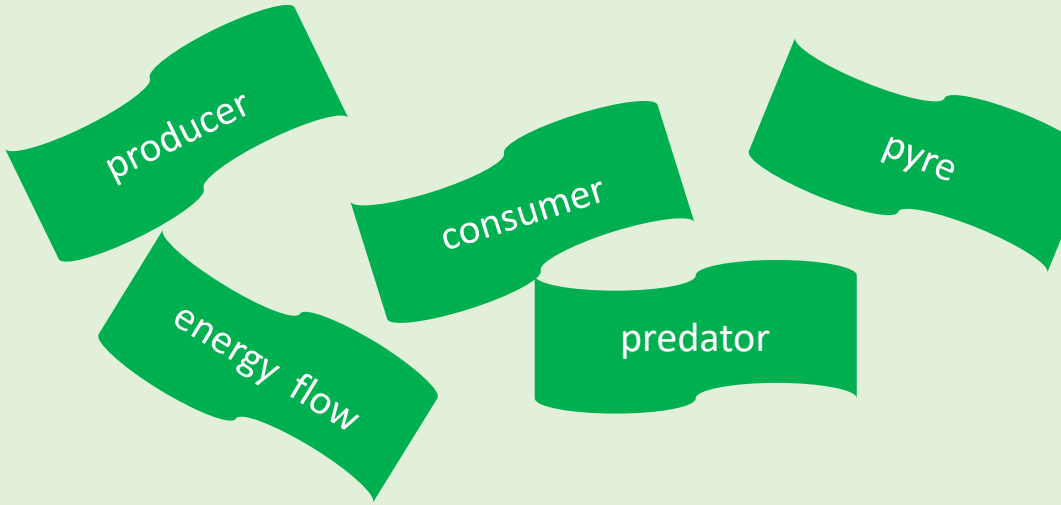
Link to game

OR

Plenary

Unscramble to reveal some of today's terms!

cup order	green wolfy	mon curse	teardrop	pyre



Food webs

20/08/2025

Page 8

Starter:

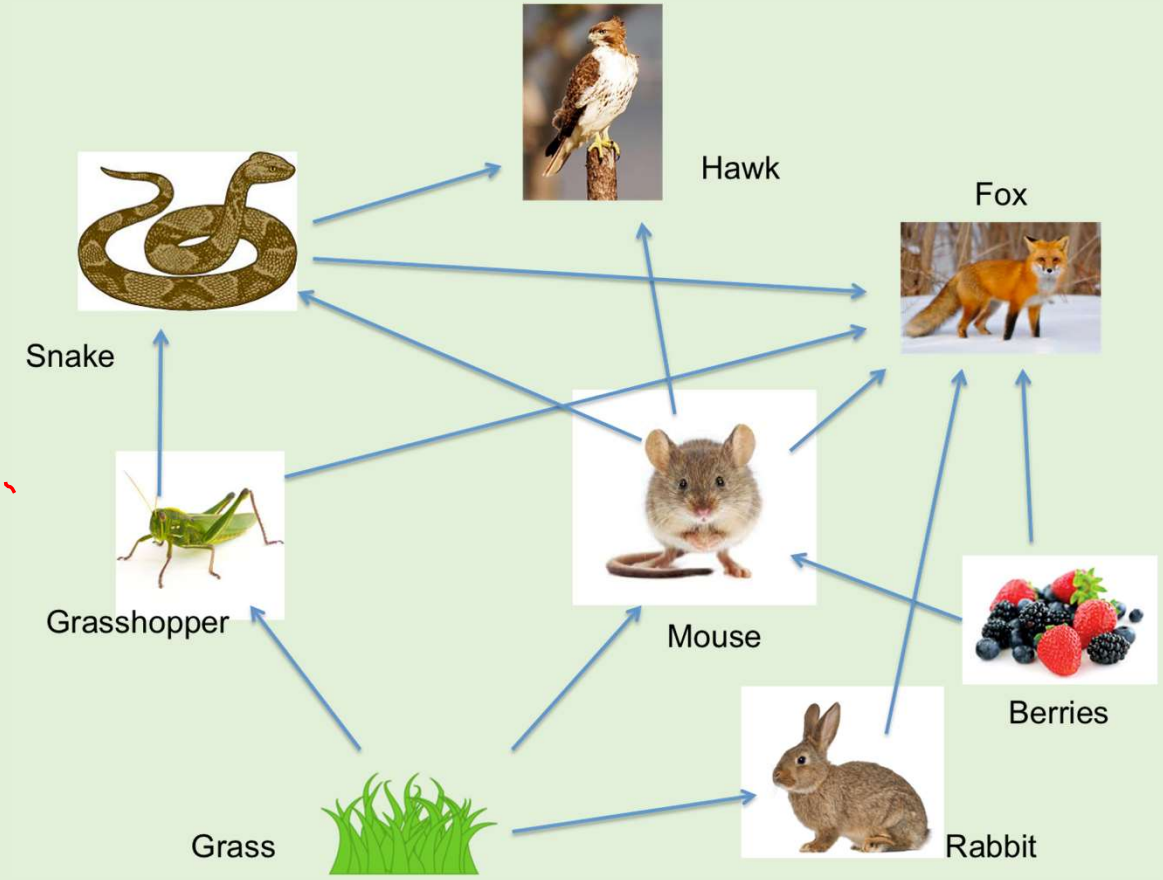
1. Does a grasshopper only eat carrots? Does a snake only eat frogs? What other things might these organisms eat?

2. How could we display this information?

Learning Intentions

1. To be able to select food chains from a food web
2. To explain what happens when an organism is added or removed from a food web SCN 4-01a

Food webs

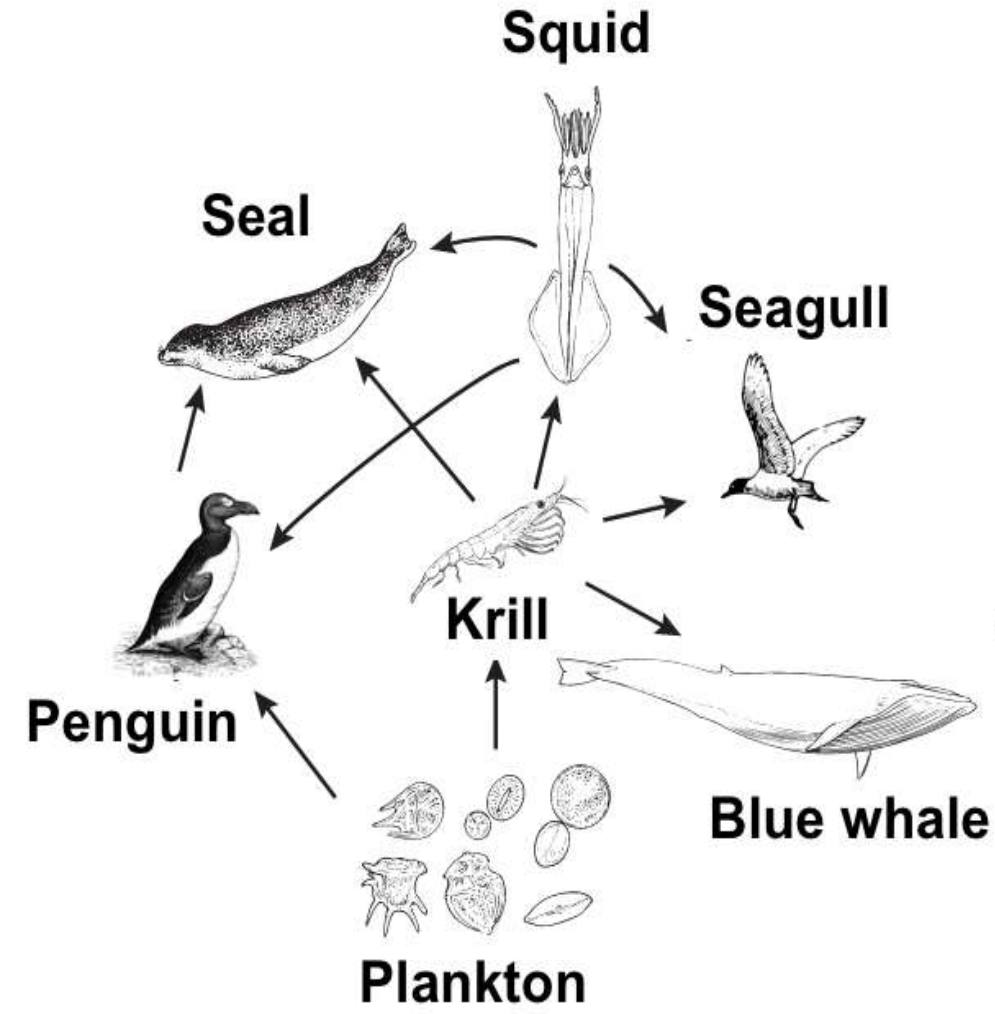


Consumers can't rely on just one food source. For this reason, food chains tend to overlap.
This can be shown using a **food web**.

Look at the food web and complete the blanks:

- The _____ gets its energy by eating BOTH grass and berries.
- The ____ gets its energy by eating snakes, grasshoppers, mice, rabbits AND berries.
- The _____ gets its energy by consuming mice and snakes.
- The _____ gets its energy by consuming grasshoppers and mice.
- The _____ and the _____ only eat grass.

Food webs



Page 9

This is an example of an aquatic food web.

Can you identify and write down a food chain with **3 organisms only?**

plankton → penguin → seal

Can you identify and write down a food chain with **4 organisms only?**

plankton → krill → squid → seal

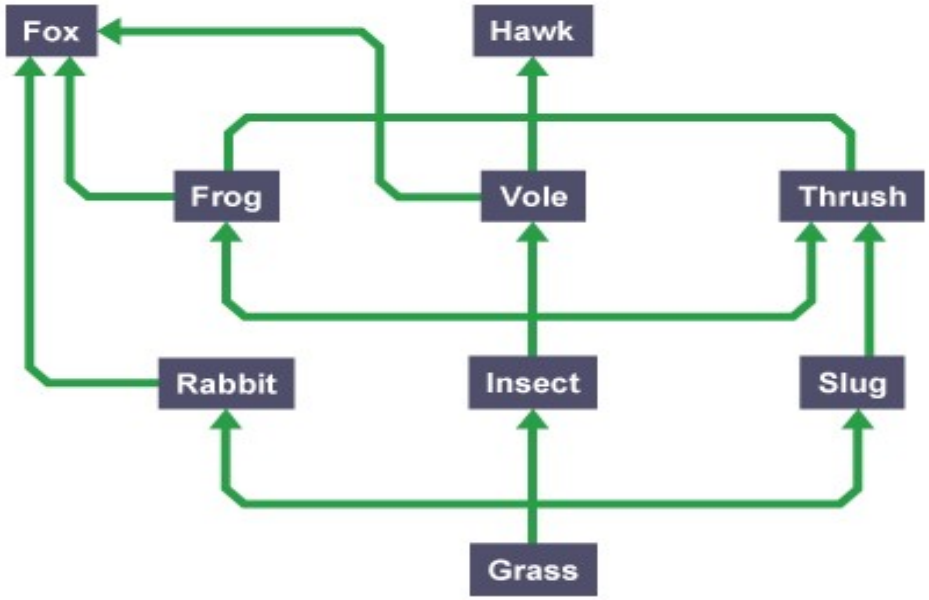
What is the **maximum number** of **different** food chains in this food web?

8?

What is the **maximum number** of **different food chains** in this food web?

Food webs

A **food web** shows the feeding relationships among different species within a habitat. The **arrows** in a food chain and food web show the direction that the energy is flowing.



Although it looks complicated, it is just several food chains joined together.

Can you complete the food chains in this food web?

grass → insect → ___?___ → ___?___.
grass → insect → ___?___ → ___?___.
grass → slug → ___?___ → ___?___.

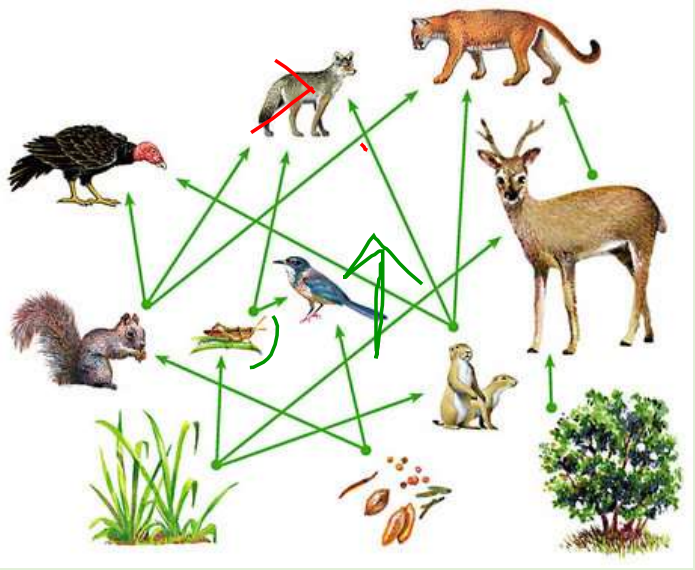
Food webs

Think: What might happen if we add or remove an organism from the food web?

Scenario 1:
A **disease** could destroy all the corn

Scenario 2:
The wolves could be **hunted** to extinction

Scenario 3:
Grey squirrels could be introduced and could **compete** with the red squirrels



Can you identify all of the species above????

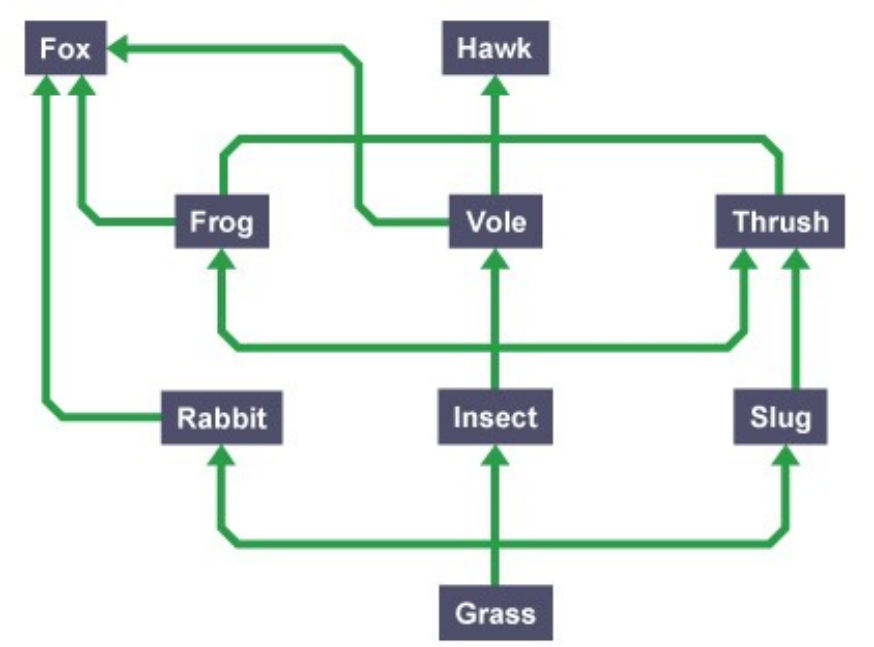
DEER	*MARMOT*	*KINGFISHER*	*VULTURE*
LYNX	*WOLF*	*RED SQUIRREL*	*BERRIES*
CORN	*SEEDS*	*GRASSHOPPER*	*BUSH*

If we remove an organism, some animals can just eat more of a different organism

If we remove a predator, some prey populations will grow and grow and grow!

If we introduce a new species, food will be less available. Competition may be strong and weaker individuals will starve and die

Food webs



Try the questions in your booklet…….

1. What would happen if the grass died?

2. If the population of slugs decreased, what would happen to the population of a) grass and b) thrush?

3. Challenge: a large population of bears were introduced to the ecosystem. Bears prey on foxes. Predict what would happen to a) the fox population and b) the rabbit population

Task: Creating a food web

1. Arrange the organisms into a food web.

2. Use the feeding relationships table to help.

3. Draw arrows in between the organisms to show which way the energy is flowing.

Organism	**What organism consumes**
Rabbit	Grass
Vole	Insects
Grass (producer)	
Slug	Grass
Thrush	Insects, Slugs
Frog	Insects
Hawk	Frogs, Voles, Thrush
Insect	Grass
Fox	Rabbits, Frogs, Voles

Plenary

Roll the dice twice and answer the question about today's lesson.

	1	2	3	4	5	6
1	Explain what you learnt in the lesson today.	How does this topic link to another subject?	What would you do differently next time?	What is your target for next lesson?	Can you list three key words from today's lesson?	How do you know you have progressed?
2	What question(s) do you still have?	Why do you think we are learning about this topic?	What did you enjoy about the lesson today?	What went well today for you?	Did you achieve any targets today?	Which of the traffic light colours would you use to describe your understanding of the lesson?
3	What skills have you developed this lesson?	When do you think today's lesson will help you?	How did you learn today?	What do you feel confident about?	Is there a key fact or point you must remember from this lesson?	Has anything inspired you today?
4	Describe the lesson using three adjectives.	Sum up the lesson in a sentence.	How could today's lesson be improved?	Did you make any mistakes today that you can learn from?	What is the most important thing you have found out in the lesson?	What was your contribution to the lesson?
5	Is there anything you did not understand in the lesson today?	Have you learnt something new this lesson?	Did you work develop any of you literacy and/or numeracy skills today?	What has really stuck with you today?	Did you try your best today in the lesson?	Where does today's lesson fit into the whole topic, what is the bigger picture?
6	What do you need to practice more?	Did you know anything before the lesson that helped you today?	How can the teacher help and support you more next lesson?	What was the most challenging part of the lesson for you?	How would you describe your level of effort for this lesson?	What has been your greatest success today in the lesson?

HOMEWORK TASK

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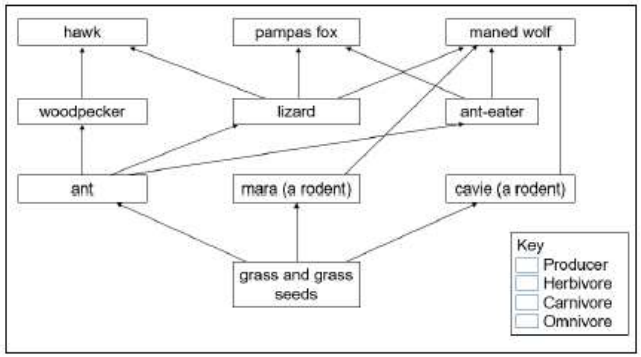
Food Chains and Food Webs Homework Name _____
S2 Science – Science in the Environment

In the pampas (grassland) of South America the climate is just right for grass – never hot enough to dry all the grass out, or cold enough to stop it growing. There is also rain all year round.

This diagram shows part of a food web in the pampas, which depends on grass for its survival.



Check the 'further facts' box and answer the questions

1. Plants make their own food using sunlight. They are called **producers**. Colour the box showing the producer green.
2. Using the 'further facts' add two more arrows from the producer box.
3. Animals that eat only plants are called **herbivores**. Colour the boxes containing the herbivores yellow.
4. Animals that eat both plants and animals are called **omnivores**. Colour the omnivores blue.
5. Animals that only eat other animals are called **carnivores**. Colour these boxes red.
6. Complete the key
7. Complete the food chain using the food web to help you.

grass → ant →

8. On the back of this sheet, write out three more food chains that exist in the pampas.

Further facts

- Woodpeckers eat grass seeds as well as insects.
- Maned wolves like fruit as well as flesh!
- The pampas fox eats grass seeds and berries too.
- Ants also eat flies and other insects.
- Maras and cavies are strictly vegetarian!
- Hawks, ant-eaters and lizards don't eat plants.

SCN 3-01a: ***I can*** *collect and analyse increasingly complex data and information, to suggest reasons for the distribution of organisms within different habitats.*

Sampling

20/08/2025

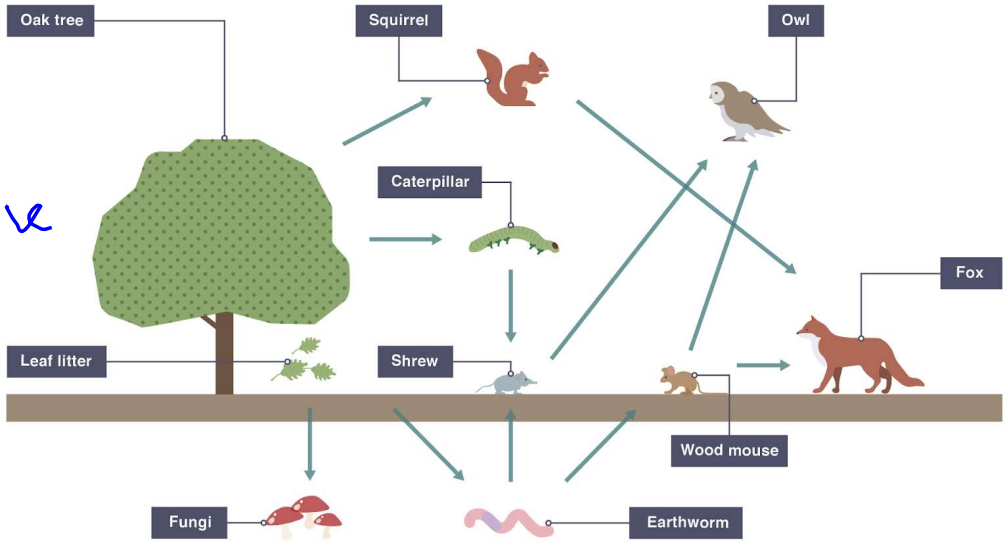
Starter:

What would happen if the wood mouse was removed from the food web?

a. To the fox population? decrease

b. To the shrew population?

c. To the red squirrel population?



Learning Intentions

1. To explain why we need to take samples
2. To describe how to measure living and non-living factors

SCN 3-01a - I can sample and identify living things from different habitats to compare their biodiversity and can suggest reasons for their distribution.

Sampling in an Ecosystem

Why do we need to sample?

It is **impossible** for us to count each and every kind of (and the number of each) plant and animal in a habitat.

It would be like trying to count different sizes and colours of grains of sand on the beach!

Sampling in an Ecosystem

Page 11

The _____variety_____ (how many different species) and _abundance_ (how many individuals in a population) tells us about the level of biodiversity. The level of biodiversity tells us how healthy an ecosystem is.

lots of species + lots of individuals = high biodiversity

few species + few individuals = low biodiversity

few species + lots of individuals = unstable biodiversity

Complete the table on Page 11

Sampling in an Ecosystem

Ecosystem	Variety *How many different species*	Abundance *How many of each species*	Biodiversity level *Low / high / unstable*
	**2** **(bird + tree)**	**2** **(1 bird + 1 tree)**	**LOW**
	**9** **(birds + trees + frogs + deer + plants + flowers + rabbits + ducks + mice)**	**24** **(3 birds + 2 trees + 1 frog + 2 deer + 6 plants + 4 flowers + 1 rabbit + 3 ducks + 2 mice)**	**HIGH**
	**2** **(plants + rabbits)**	**20** **(18 plants + 2 rabbits)**	**UNSTABLE**

*lots of species + lots of individuals = **high biodiversity***

*few species + few individuals = **low biodiversity***

*few species + lots of individuals = **unstable biodiversity***

Butterfly Conservation's

BIG BUTTERFLY COUNT

15 JULY - 7 AUGUST 2022

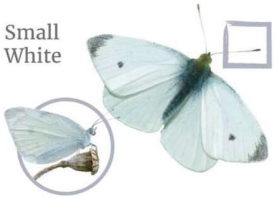
Spend 15 minutes in a sunny spot. Use this chart to note how many of each species you see. Then submit your sightings at **www.bigbutterflycount.org** or download our free app

DFN Charitable Foundation

Vivara .co.uk

Large White 3

Small White



Green Veined White

Common Blue

Holly Blue 1

Small Copper

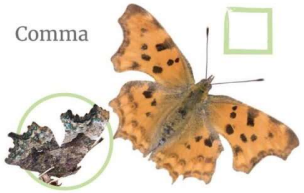
Speckled Wood 4

Meadow Brown

Ringlet 5

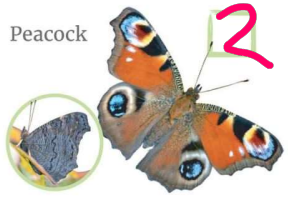
Scotch Argus

Comma



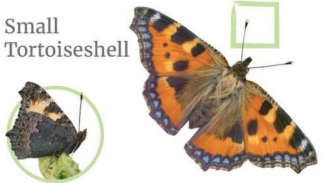
Painted Lady

Peacock 2

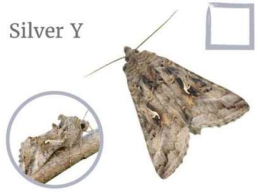


Red Admiral 6

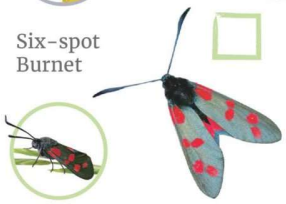
Small Tortoiseshell



Silver Y



Six-spot Burnet



Don't forget to join us online with **#ButterflyCount**

Males and females of some species vary and are not all illustrated on this chart. Please refer to the Big Butterfly Count app or website for more information on how to identify butterflies and moths correctly.

Images not to scale

Sampling Ecosystems

20/08/2025

We can investigate an ecosystem by using _sampling_ _techniques_

We can sample variety and abundance of plants and animals: _living_ _factors_ .

We can also measure _non_ - _living_ _factors_ such as temperature, soil pH and light intensity

quadrat

pit fall trap

thermo-meter

pH meter

light meter

Sampling Ecosystems

20/08/2025

quadrat

Quadrats are used to sample plants (or very slow animals!)

pit fall trap

Pit fall traps are used to sample invertebrates (like insects)

Both **quadrats** and **pit fall** traps allow us to estimate **living factors** like abundances of plant species and animal species

Sampling Ecosystems

20/08/2025

thermometer

temperature!

pH/soil moisture meters

soil pH and soil moisture!

light meter

light intensity!

Thermometers, pH meters, soil moisture meters and **light meters** are just a few of the tools we can use to measure **non-living factors**.

Sampling: lets go outside!!!!

20/08/2025

Lets look at this quadrat sample first…….

Quadrats have 5x5 squares

Rather than count individual plants, 😟
We count the number of squares that contain a plant species.

This gives us an abundance score out of 25.

The abundance score of daisies in this sample is…….

Sampling: lets go outside!!!!

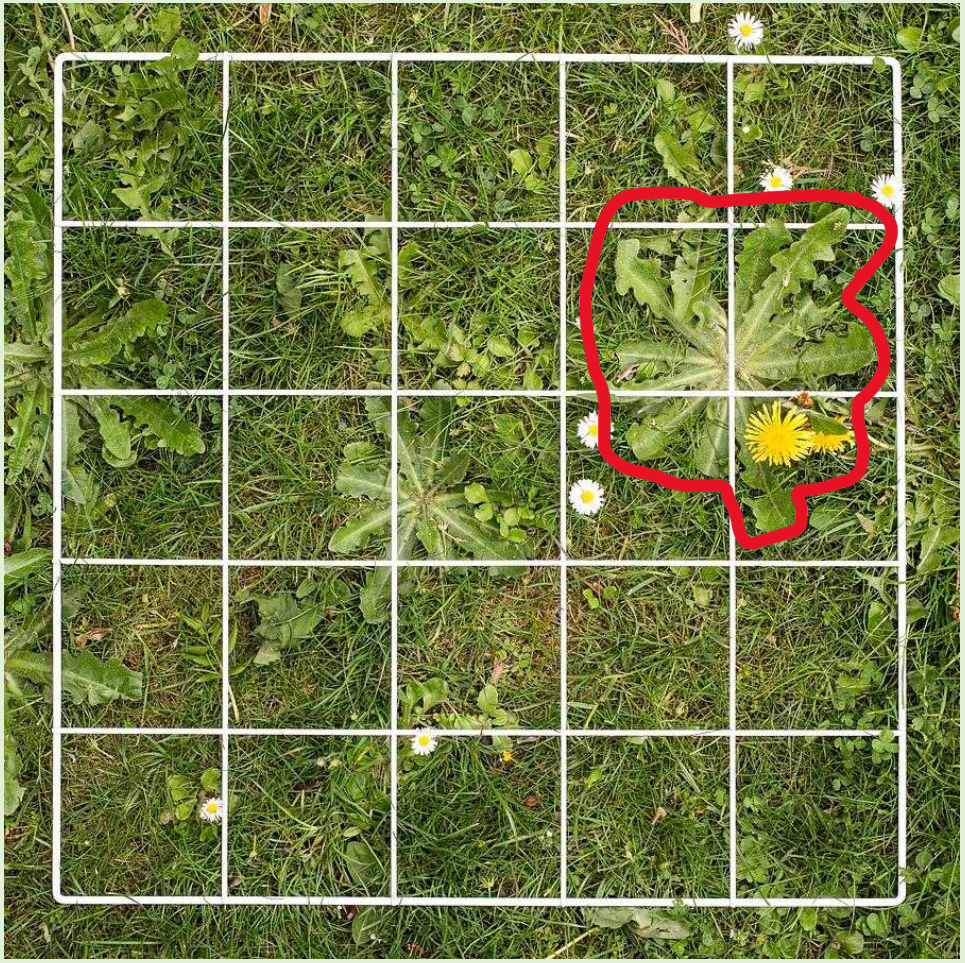
20/08/2025

What if one plant is in more than one square???? Like this dandelion?

We have to agree a rule so that we don't count the same plant twice

The easiest way to do this is to only count plants in if most of the plant touches the **left and bottom** sides of the square.

Lets try this on the next slide……..



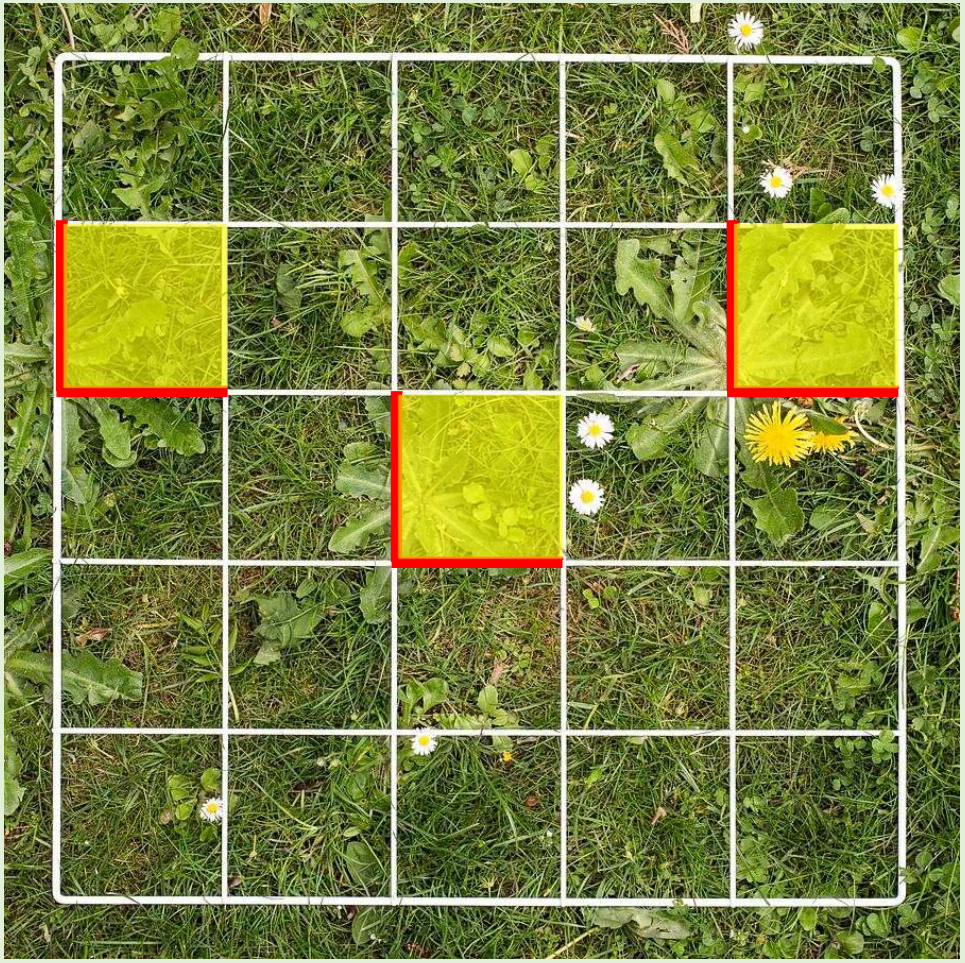
Sampling: lets go outside!!!!

20/08/2025

Remember the “L-rule!”
left and bottom sides of the square.

We would say that the abundance score for dandelions in this sample is 3.

What do you think the abundance score is for grass?!!!!



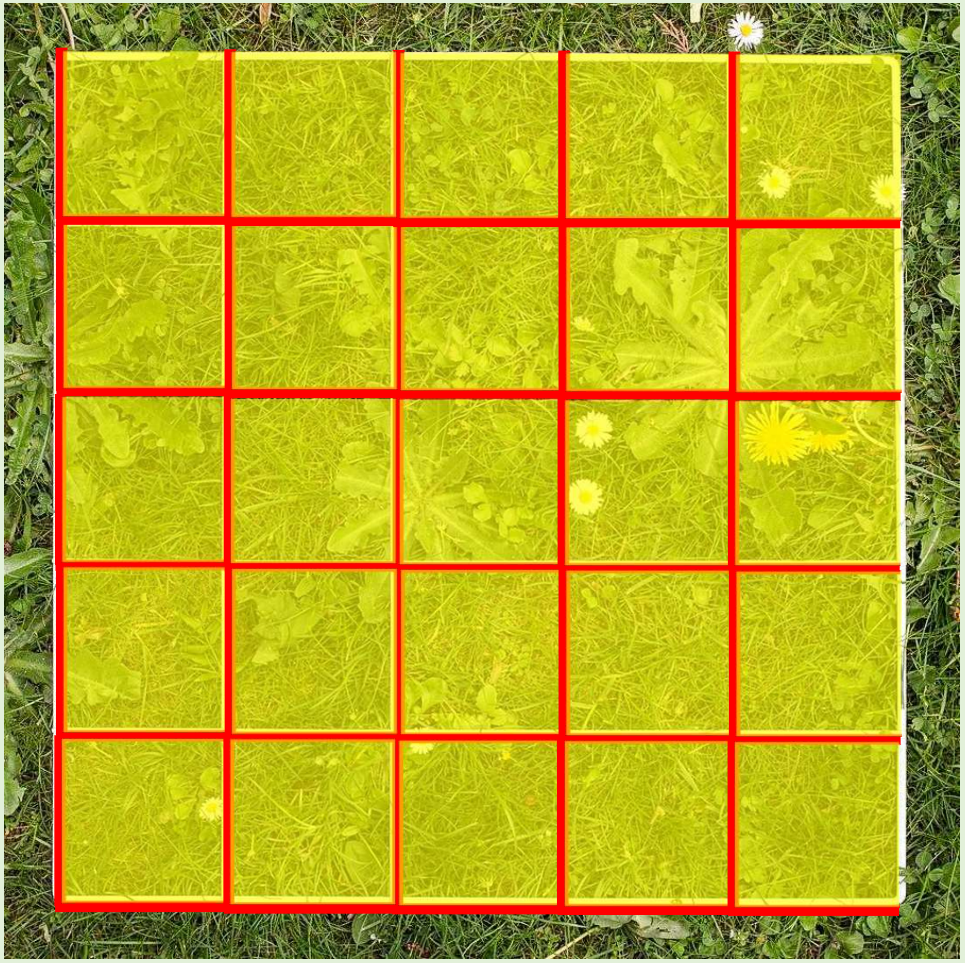
Sampling: lets go outside!!!!

20/08/2025

Remember the “L-rule!”
left and bottom sides of the square.

We would say that the abundance score for dandelions in this sample is 3.

What do you think the abundance score is for grass?!!!! 😆



Sampling: lets go outside!!!!

20/08/2025

What if our quadrat was in a part of the field that just didn’t have many daisies?

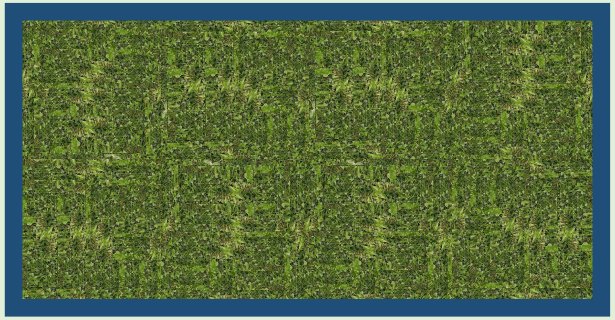
To get a more reliable estimate, we should sample more than one area of the field!

How many samples?
Well that depends!!!!!

Sampling: lets go outside!!!!

20/08/2025

What if our quadrat was in a part of the field that just didn’t have many daisies?



To get a more reliable estimate, we should sample more than one area of the field!

How many samples?
Well that depends!!!!!

Is the field very big????

Sampling: lets go outside!!!!

20/08/2025

How to use a quadrat:

1. **Identify** a plant (daisies/clover/etc.)
2. **Record** the name of your plant in the table
3. Throw the quadrat randomly
4. **Count the number of squares** that have **your plant**
5. Record the abundance score in the table
6. **Repeat** another 9 times
7. Take an average of the ten throws

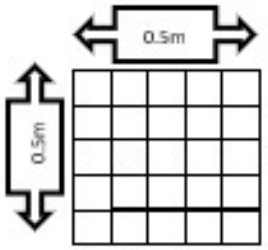
Quadrat	Number of _____
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Average _____ per quadrat	

Quadrats: Shared working

20/08/2025

Quadrat	Number of _____
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Average _____ per quadrat	

Numeracy extension:



1. Our quadrat measures 0.5 metres by 0.5 metres.
   What is the area of ONE quadrat?
   space for working

   Answer = _____ m^2

2. What was the **average** abundance score *(from table)*?

   Answer = _____ plants

3. The area we sampled was 20 metres by 60 metres
   Work out the area of our sample?
   space for working

   Answer = _____ m^2

4. What is our estimate of the total number of plants in our sample area?
   space for working

   Answer = _____ estimated plants in area.

Hint: *Divide the total area (qn 3) by the area of one quadrat (qn 1)*
Then, multiply this by our average abundance score (qn 2)

Quadrats: Example of working

20/08/2025

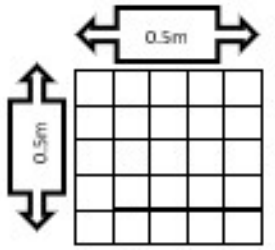
Quadrat	Number of daisies
1	5
2	8
3	13
4	5
5	5
6	1
7	6
8	8
9	6
10	3
Average daisies per quadrat	6

Average = $\frac{\text{sum of numbers}}{\text{number of samples}}$

Average = $\frac{5+8+13+5+5+1+6+8+6+3}{10}$

Average = $\frac{60}{10} = 6$

Numeracy extension:



1. Our quadrat measures 0.5 metres by 0.5 metres.
   What is the area of ONE quadrat?
   space for working

   0.5 x 0.5 = 0.25

   Answer = 0.25 m^2

2. What was the **average** abundance score *(from table)*?

   Answer = 6 plants

3. The area we sampled was 20 metres by 60 metres
   Work out the area of our sample?
   space for working

   20 x 60 = 1200

   Answer = 1200 m^2

4. What is our estimate of the total number of plants in our sample area?
   space for working

   $\frac{1200}{0.25}$ X 6 = 4800 x 6

   Answer = 28,800 estimated plants in area.

Hint: Divide the total area (qn 3) by the area of one quadrat (qn 1)
Then, multiply this by our average abundance score (qn 2)

Rainy Day Quadrats

20/08/2025

There are a number of different ways we can practice using quadrats….

- Wrapping paper and 5cm x 5cm quadrat
- On the floor with stationary or buttons using our 0.5m x 0.5m quadrat
- On the smartboard on next slide!!!

Plenary

Try to come up with a key word from this topic worth the most points in Scrabble.

See if you can beat the rest of the class!

Sampling animals: Pitfall traps

20/08/2025

Starter:

1. State the piece of equipment that can be used to sample plants

2. Three quadrats were thrown. The results were as follows:

Quadrat Number	Abundance of daisies
1	12
2	10
3	5

$(12+10+5) \div 3$

Calculate the average number of daisies per quadrat.

3. The area of the quadrat is **1 m²** and the area of the whole field is **100 m²**.

   Calculate the estimated number of daisies in the **whole field**.

Sampling animals: Pitfall traps

20/08/2025

Learning Intentions:

1. To sample invertebrates using a pit fall trap
2. To identify some invertebrates using a biological key

Sampling animals: Pitfall traps

20/08/2025

Success Criteria

Tick me at the end if ***you can*** …

- ❑ **I can use a pitfall trap to sample invertebrates**
- ❑ **I can use a biological key to identify some invertebrates**

Word bank

Invertebrates ***sample*** ***pitfall trap***

Sampling animals: Pitfall traps

20/08/2025

- Pitfall traps are used to sample the organisms that live in the soil.

How to set up a pitfall trap:

1. Dig a hole in the soil
2. Pierce drainage holes in the bottom of the pitfall trap
3. Place the pitfall trap into the soil, level with the ground
4. Cover the trap with a leaf
5. When you come back to check your traps: **take pictures**…… you might be able to identify them later when we learn about biological keys!

Sampling animals: Pitfall traps

20/08/2025

- The pitfall trap was checked after 4 days and the following organisms counted:

Organism	Number of individuals
Ladybird	6
Ant	10
Butterfly	0
Woodlouse	4
Centipede	3

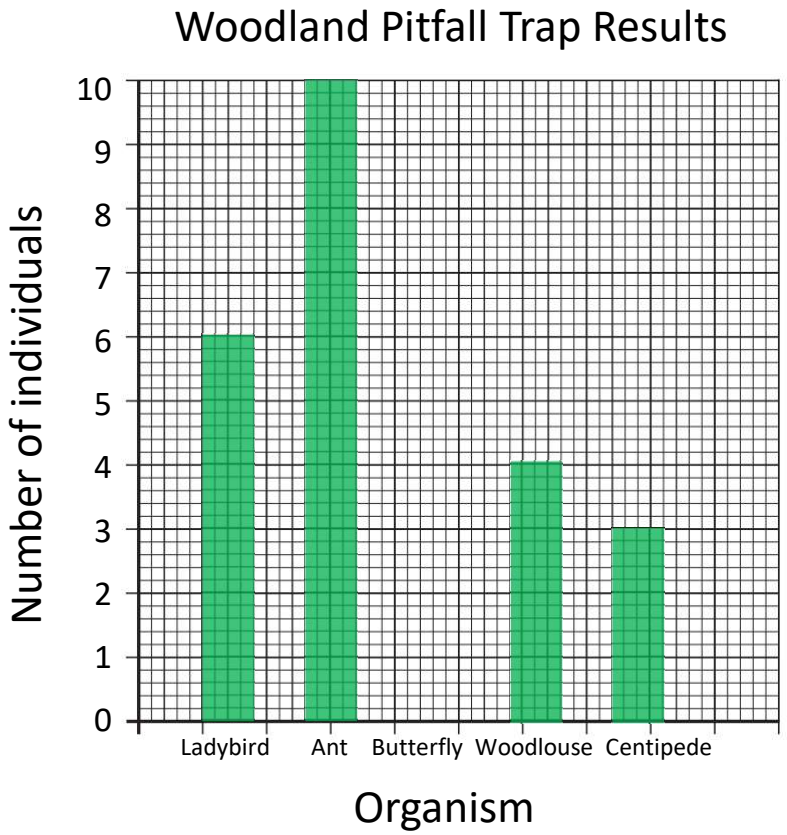
- Activity: Construct a BAR graph using this information

Sampling animals: Pitfall traps

20/08/2025

Bar Graph: WAGOLL

- Title
- X-axis label
- Y-axis label + units
- Appropriate scale
- Neat bars
- Correctly drawn bars



Sampling animals: Pitfall traps

20/08/2025

Conclusion:

The most abundant organism was _____

The least abundant organism was _____

Why?

_____

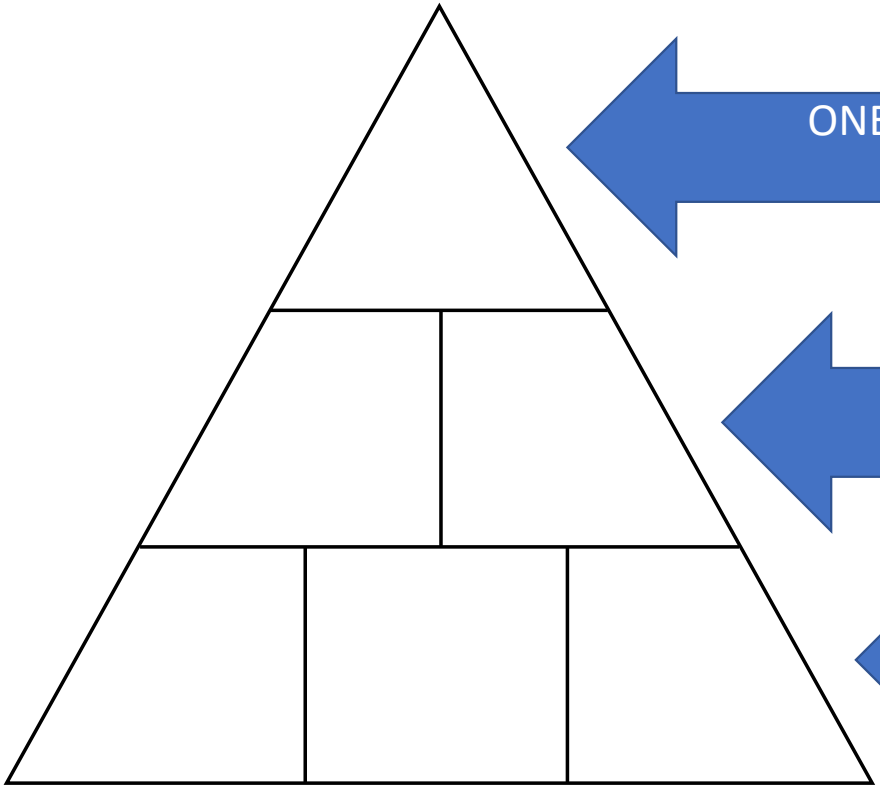
_____

_____

Sampling animals: Pitfall traps

20/08/2025

Plenary:



ONE thing **I still want to know** about SAMPLING ECOSYSTEMS

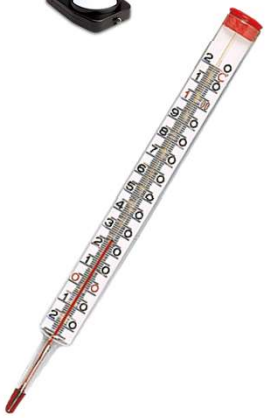
TWO things **I knew already**

THREE things **I learned today**

Measuring Abiotic factors

20/08/2025

Starter: Today we will be learning about measuring abiotic factors. Do you know what any of the devices below can be used to measure?



Measuring Abiotic factors

20/08/2025

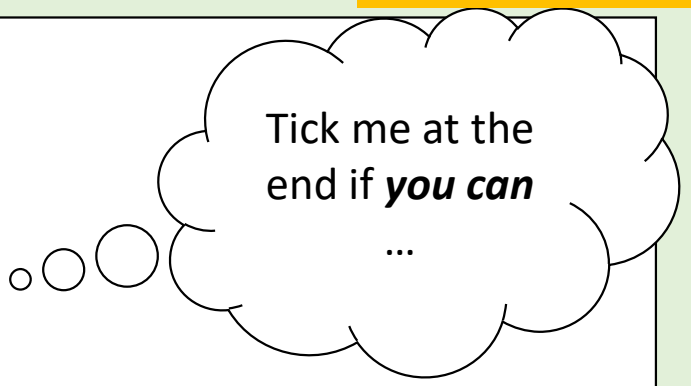
Learning Intentions:

1. To state what an abiotic factor is
2. To name some examples of abiotic factors
3. To investigate an abiotic factor
4. To explain why measuring abiotic factors might be important

Measuring Abiotic factors

20/08/2025

Success Criteria



- ❑ **I can state what an abiotic factor is**
- ❑ **I can name an abiotic factor**
- ❑ **I have investigated an abiotic factor**

Word bank

abiotic ***factor*** ***measure*** ***specific***

Measuring Abiotic factors

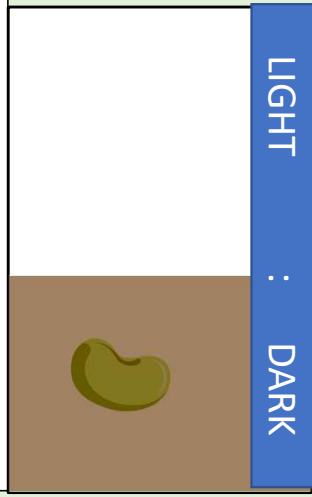
20/08/2025

Page 14

Abiotic factors are non-living factors such as temperature, soil pH and light intensity. Other examples include wind speed, carbon dioxide/oxygen levels, humidity, rainfall and air pressure but there are MANY MORE!

Living things need **specific** environmental conditions to survive.

For example:
Seeds need water, oxygen and a suitable temperature to germinate. When the **seedling** comes through the soil it needs water, carbon dioxide, a suitable temperature and **LIGHT** to carry out photosynthesis (we will be learning about this soon!).



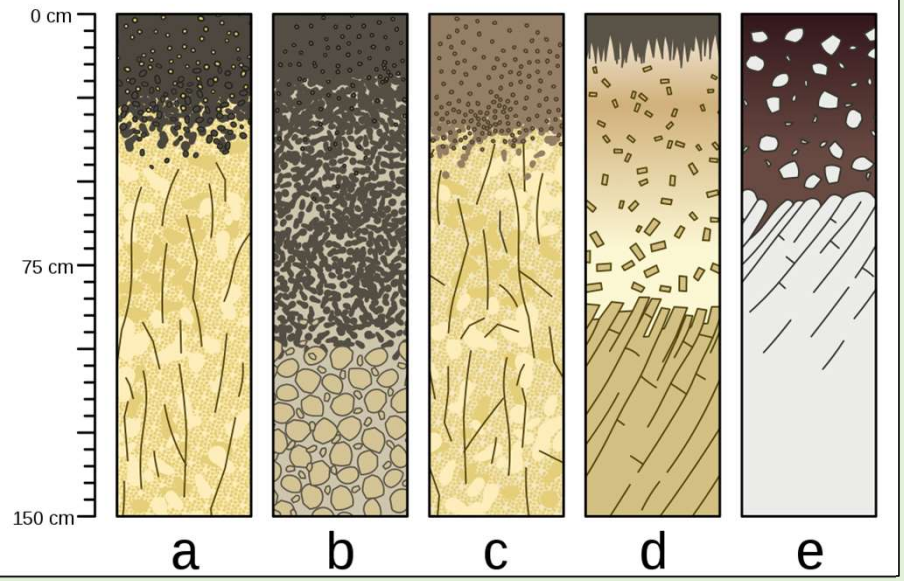
Measuring Abiotic factors: Experiment

20/08/2025

Plants need moisture to grow. You can use a moisture meter to measure soil moisture in the garden. You can also carry out an experiment to measure the percentage (%) water content in soil samples:

The picture shows 5 soil samples and the different compositions they have.

What do you think the y-axis scale shows?
How might soil type affect living things?



SCN 3-01a: *Identifies living things using biological keys. Collects and analyses increasingly complex data and information, for example, temperature and light intensity, to suggest reasons for the distribution of organisms within different habitats.*

Measuring Abiotic factors: Experiment

20/08/2025

Aim: To investigate the moisture levels in different soil samples.

Kit:

Soil samples
Oven
Fine balance

Large spatula
Metal crucible/foil case
Access to soap & water!

Measuring Abiotic factors: Experiment

20/08/2025

Method:

1. Use a large spatula to take soil samples from different areas in the school grounds.
2. Put each sample in a labelled sample bag
3. In the lab, weigh an EMPTY crucible and record the mass in your results table.
4. Transfer your soil sample to the crucible and re-weigh. Record the mass in your results table.
5. Place the crucibles in a warm place (your teacher may put them in an oven until next lesson)
6. Next lesson, re-weigh the crucible and work out how much water has evaporated.

Measuring Abiotic factors: Experiment

20/08/2025

Results:

Sample Number	Sample location	Mass of empty crucible (g)	Mass of crucible plus "wet soil" (g)	Mass of "wet soil" (g)	Mass of crucible plus "dry soil" (g)	Mass of "dry soil" (g)	Mass of water evaporated (g)	Percentage water content of sample %
		a	b	c (b – a)	d	e (d - a)	fe(c – c)	$\frac{f}{c}$ X 100
example	*polycrub*	*0.2*	*2.4*	*2.4 – 0.2 = 2.2*	*0.8*	*0.8 – 0.2 = 0.6*	*2.2 – 0.6 = 1.6*	$\frac{1.6}{2.2}$ X 100 *= 73 %*

Measuring Abiotic factors: Experiment

20/08/2025

Example Results:

Sample Number	Sample location	Mass of empty crucible (g)	Mass of crucible plus "wet soil" (g)	Mass of "wet soil" (g)	Mass of crucible plus "dry soil" (g)	Mass of "dry soil" (g)	Mass of water evaporated (g)	Percentage water content of sample %
		a	b	c (b – a)	d	e (d - a)	f (c – e)	$\frac{f}{c}$ X 100
example	*playing field*	*0.2*	*2.4*	*2.4 – 0.2 = 2.2*	*0.8*	*0.8 – 0.2 = 0.6*	*2.2 – 0.6 = 1.6*	$\frac{1.6}{2.2}$ X 100 *= 73 %*
1	Long jump pit	*0.2*	2.8	2.8 – 0.2 = 2.6	2.4	2.4 – 0.2 = 2.2	2.6 – 2.2 = 0.4	$\frac{0.4}{2.6}$ X 100 = 15%
2	woodland	*0.2*	3.0	3.0 – 0.2 = 2.8	1.6	1.6 - 0.2 = 1.4	2.8 – 1.4 = 1.4	$\frac{1.4}{2.8}$ X 100 = 50%
3	marshland	*0.2*	5.0	5.0 – 0.2 = 4.8	1.2	1.2 – 0.2 = 1.0	5.0 – 1.0 = 4.0	$\frac{4.0}{4.8}$ X 100 = 83%

Measuring Abiotic factors: Experiment

20/08/2025

Conclusion:

Were there differences in the percentage moisture of your soil samples?

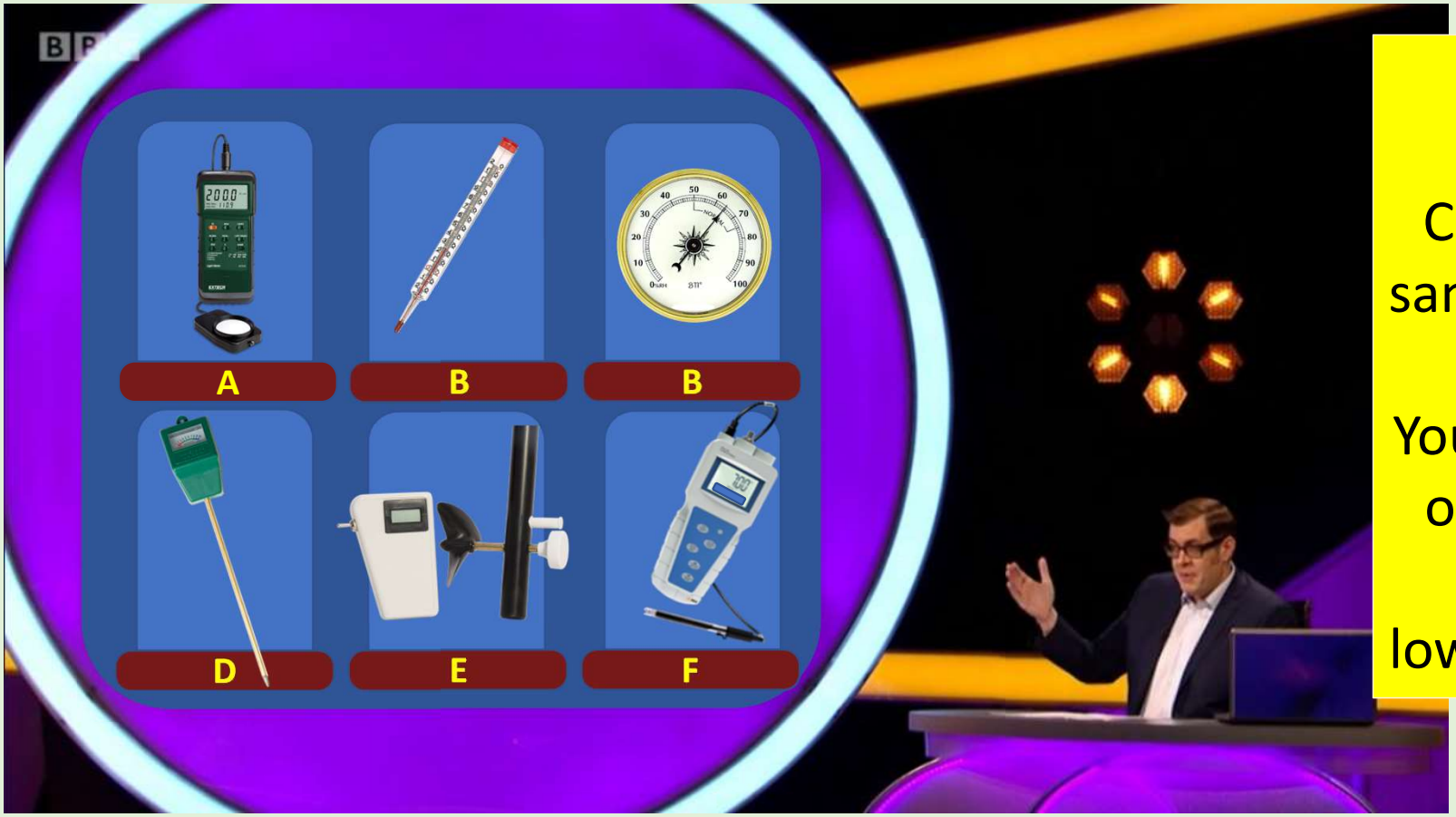
(Hint: which soil had the highest % moisture / lowest % moisture?)

Evaluation:

Are there any other variables that might have affected your results?
(Hint: What was the weather like on the day you took your samples? Is there anything you could you do to get a better result?)

Plenary

POINTLESS!
Kit used to measure abiotic factors



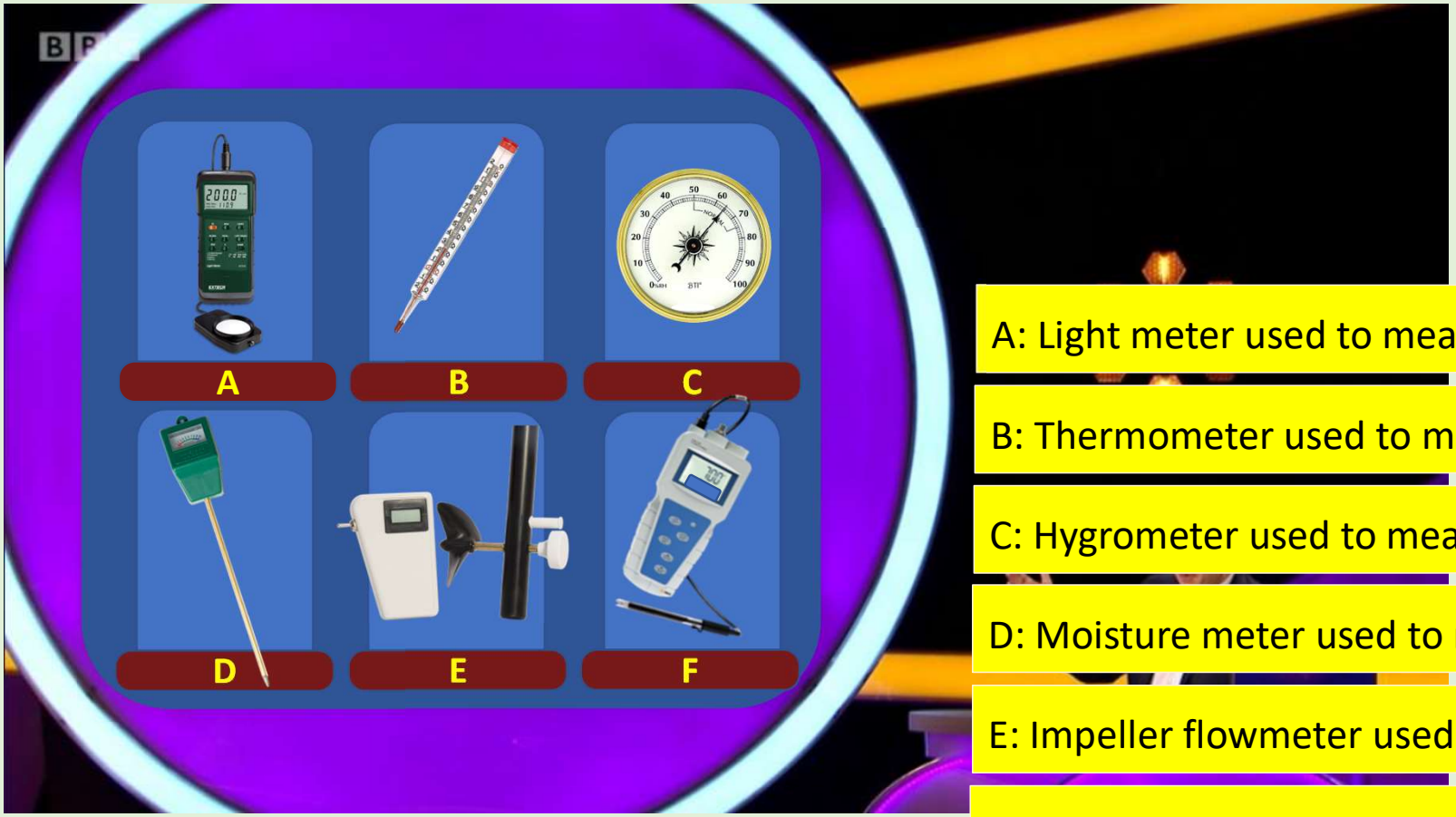
POINTLESS!

Can you identify the sampling equipment in the picture?
You need to be correct or score 100 points!
Winner gets the lowest scoring answer!

Answers from highest scoring to lowest scoring on next slide……..

Plenary

POINTLESS!
Kit used to measure abiotic factors



A: Light meter used to measure light intensity **63**

B: Thermometer used to measure temperature **88**

C: Hygrometer used to measure humidity **11**

D: Moisture meter used to measure soil moisture **52**

E: Impeller flowmeter used to measure river speed **0**

F: pH meter used to measure soil pH **38**

Extra/Cover lesson

Watch:

How Motherwell's pitch survives Scotland's winter weather

- https://youtu.be/UST0M8PG66o?si=2F8rvFUBQITZNI5p/

Watch, completing the table at the back of the booklet (Page___)

The Incredible Science of Football Pitches

- https://www.youtube.com/watch?v=frGHtxOkVl8

Identifying Plants + Animals: Keys

20/08/2025

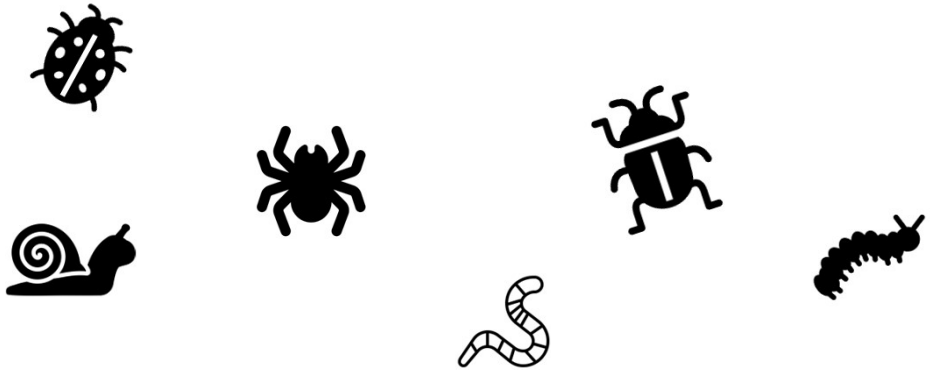
Starter:

Did you take any pictures of insects you found in your pitfall traps?

If yes, draw them here!

If no, draw a few of the insects below!

Did you take pictures??



Identifying Plants + Animals: Keys

20/08/2025

Learning Intentions:

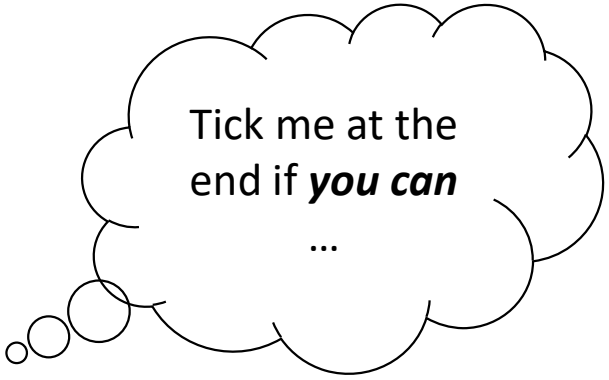
1. To identify differences between species of **plants**
2. To identify differences between species of **animals**
3. To **use** a biological key

Identifying Plants + Animals: Keys

20/08/2025

Success Criteria

- ❑ **I can describe features of plants and animals to identify them from each other**
- ❑ **I can <u>use</u> a biological key to identify living things**
- ❑ **I can <u>make</u> my own biological key**



Word bank

feature	***characteristic***	***key***
differences	***similarities***	

SCN 3-01a - I can identify living things using biological keys.

IMPORTANT: many more examples of biological keys at the end of the powerpoint!!!

Identifying Plants + Animals: Keys

20/08/2025

A biological **key** is use to identify living things by the features they have. There are so many different living things on Earth that it is IMPOSSIBLE for anyone to learn them all!

Over **one million** species of insects have been discovered and described but it is estimated that there may be as many as **10 million** species on earth.

What percentage of insect species have still to be discovered??

Space for working

Royal Entomological Society

10 %

Identifying Plants + Animals: Keys

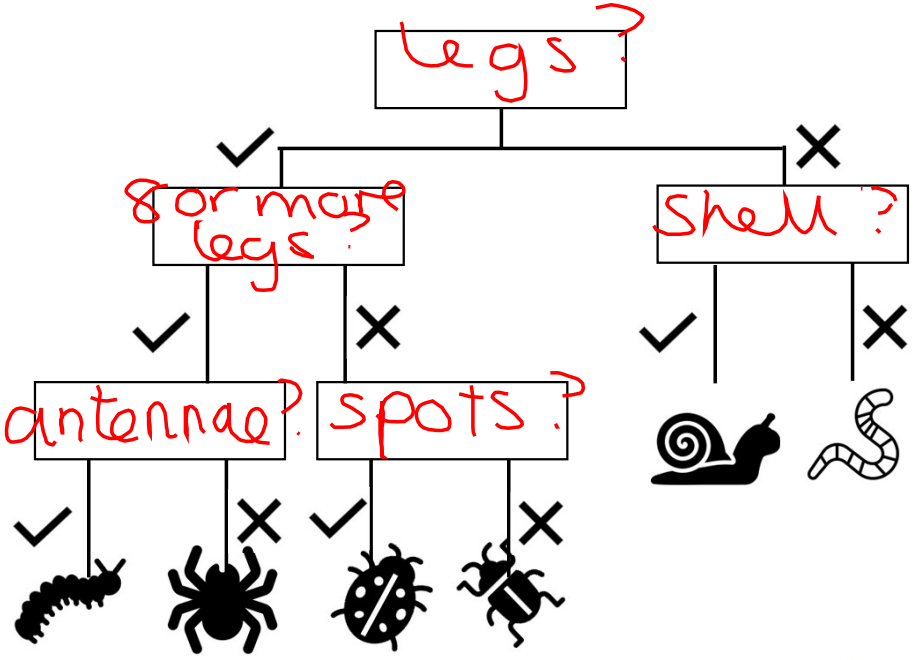
20/08/2025

There are two main types of biological key:

A paired statement key

1.	*Insect has legs……*	*Go to 2*
	Insect has no legs….	*Go to 3*
2.	*Insect has 8 or more legs…..*	*Go to 4*
	Insect has less than 8 legs….	*Go to 6*
3.	*Insect has a shell…..*	*SNAIL*
	Insect has no shell…..	*WORM*
4.	*Insect has antennae….*	*CATERPILLAR*
	Insect has no antennae…	*SPIDER*
5.	*Insect has spots…*	*LADYBIRD*
	Insect has no spots….	*BEETLE*

A branching key



Use the paired statement key 👆 ..... to complete the branching key 👆

Identifying Plants + Animals: Keys

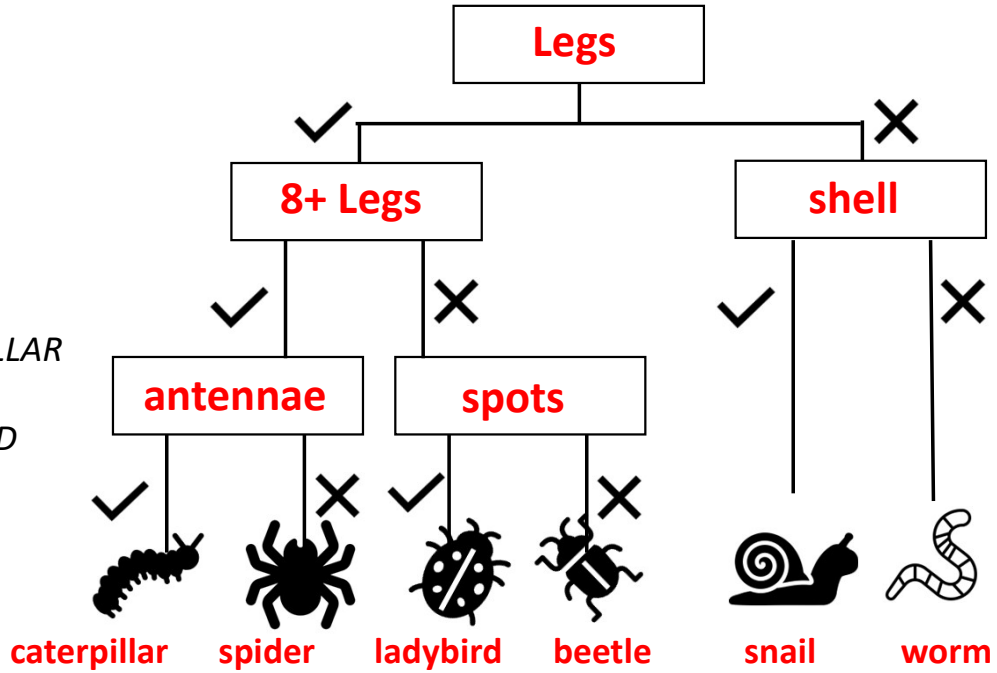
20/08/2025

There are two main types of biological key:

A paired statement key

1.	*Insect has legs……*	*Go to 2*
	Insect has no legs….	*Go to 3*
2.	*Insect has 8 or more legs…..*	*Go to 4*
	Insect has less than 8 legs….	*Go to 6*
3.	*Insect has a shell…..*	*SNAIL*
	Insect has no shell…..	*WORM*
4.	*Insect has antennae….*	*CATERPILLAR*
	Insect has no antennae…	*SPIDER*
5.	*Insect has spots…*	*LADYBIRD*
	Insect has no spots….	*BEETLE*

A branching key



Use the paired statement key 👆 ..... to complete the branching key 👆

Identifying Plants + Animals: Keys

20/08/2025

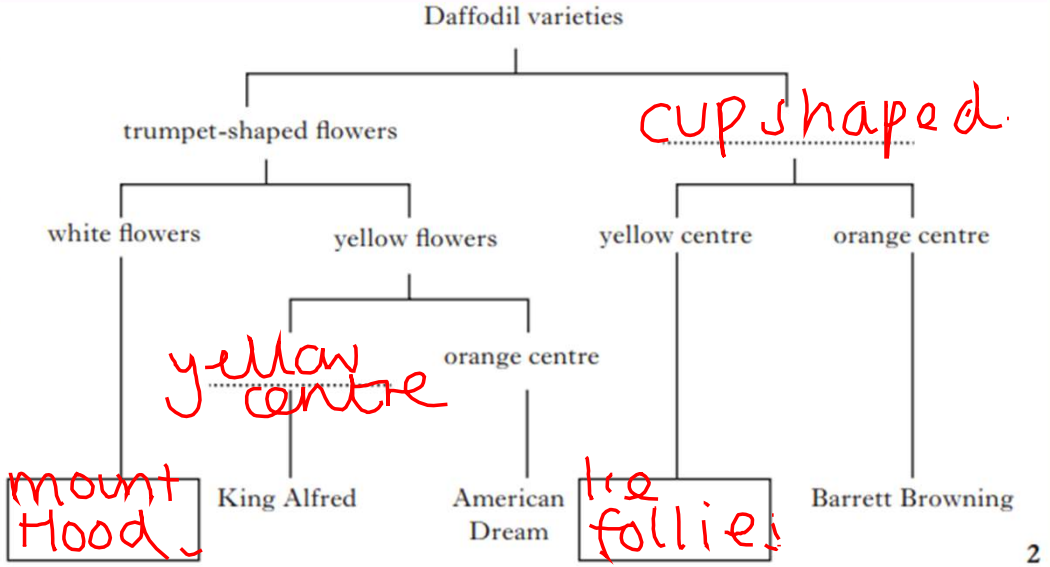
Extra Task

Printed Sheet

2. Some features of five varieties of daffodils are shown in the table below.

Variety	*Flower shape*	*Flower colour*	*Centre colour*
American Dream	trumpet	yellow	orange
Mount Hood	trumpet	white	white
Ice Follies	cup	white	yellow
King Alfred	trumpet	yellow	yellow
Barrett Browning	cup	white	orange

(*a*) Use the information in the table to complete the key below by writing the correct feature on each dotted line and the correct names in the empty boxes.



2

(*b*) Give **three** features of the American Dream daffodils.

- trumpet shaped flower
- yellow flower colour
- orange centre colour

1

(*c*) Describe **one** difference between Ice Follies and Barrett Browning daffodils.

Ice follies have yellow centre
Barrett Browning have orange

1

Identifying Plants + Animals: Keys

20/08/2025

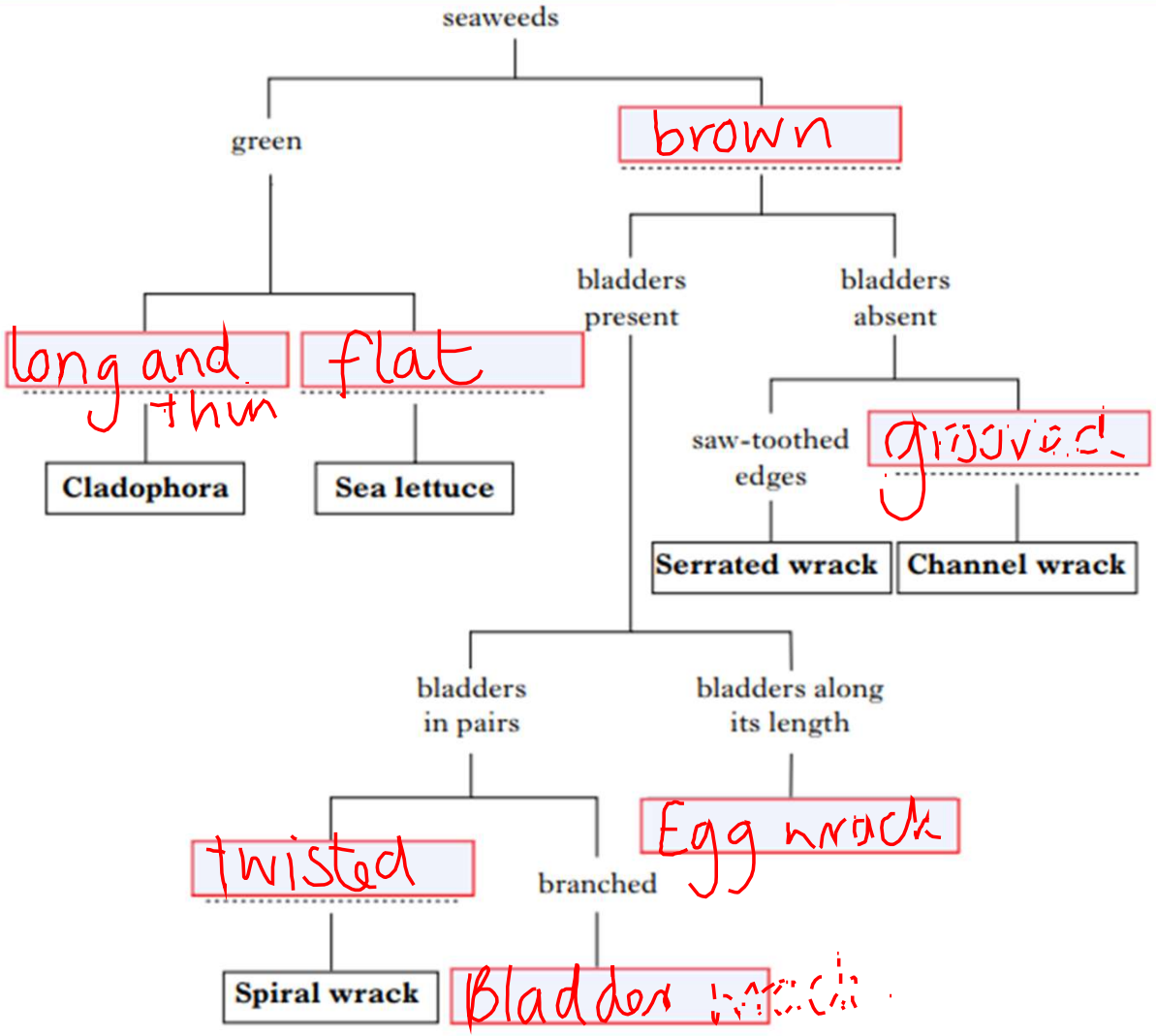
Extra Task

Printed Sheet

3. Some features of common seaweeds are shown in the table below.

Seaweed	*Colour*	*Shape*	*Bladders*
Bladder wrack	brown	branched	in pairs
Channel wrack	brown	grooved	absent
Cladophora	green	long and thin	absent
Egg wrack	brown	branched	along its length
Sea lettuce	green	flat	absent
Serrated wrack	brown	saw-toothed edges	absent
Spiral wrack	brown	twisted	in pairs

(*a*) (i) Use the information in the table to complete the key below by writing the correct feature on each dotted line and the correct seaweed names in the empty boxes.



Identifying Plants + Animals: Keys

20/08/2025

Back of Booklet

More Fun Facts!

1. There are approximately 1.4 billion insects for every person on Earth. The total weight of all the insects is about 70 times more than all the people.
2. It takes bees about 10 million nectar-collecting trips to make one pound of honey
3. The only insect indigenous to Antarctica is the wingless midge, *Belgica Antarctica*
4. Scientists estimate that insects make up to 90% of all species of animals on the planet and more than half of all living things.
5. Insects can be found in almost every habitat, from mountain ranges covered in snow to the hottest deserts on the planet.
6. Insects have been around for more than 350 million years, longer than the dinosaurs and flowering plants.
7. The largest known order of insects is Coleoptera (beetles), some 300,000 to 400,000 species of beetle have been described to date. The next largest is the Lepidoptera (butterflies and moths), followed by the Diptera (true flies) and then the Hymenoptera (ants, bees and wasps).

https://www.royensoc.co.uk/understanding-insects/classification-of-insects/
https://www.woodlandtrust.org.uk/blog/2023/10/common-uk-insect-identification/

Royal Entomological Society

WOODLAND TRUST

Additional Activity / Cover Lesson

Poster:

Use the web links to research insects.

Success Criteria:

- Title
- Poster describes what features insects have
- Identified one insect and drawn a picture
- Included “fun facts”
- ★ Why are insects so important?

Identifying Plants + Animals: Keys

20/08/2025

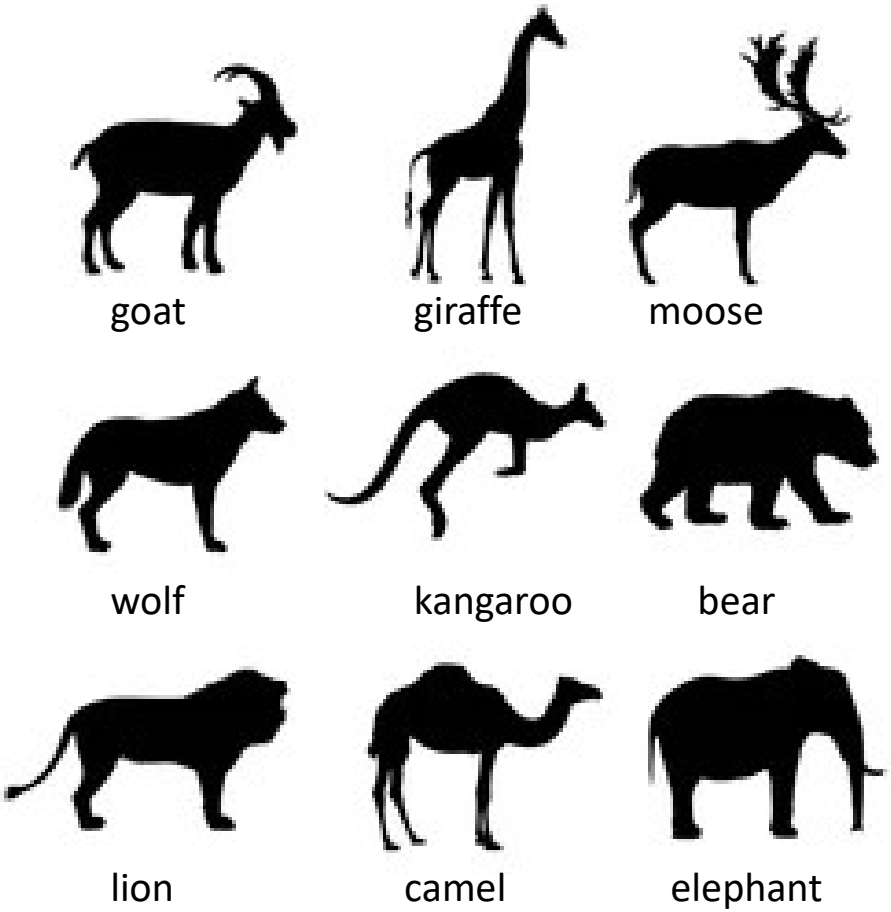
Starter:

Pick **one** of the animals:

Remember your choice but don't tell anyone!!

Write down some features of your animal
(hint: number of legs, shape of ears, length of tail, fur colour, etc.)

Your teacher may play "guess the animal" if you have time later!



Identifying Plants + Animals: Keys

20/08/2025

Learning Intentions:

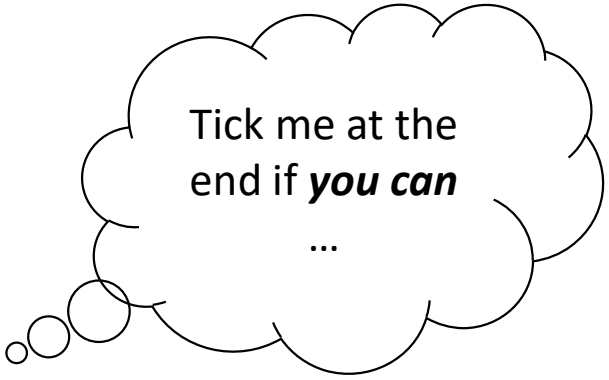
1. To identify differences between species of **plants**
2. To **construct** a biological key

Identifying Plants + Animals: Keys

20/08/2025

Success Criteria

- ❑ **I can describe features of plants to identify them from each other**
- ❑ **I can <u>make</u> my own biological key**



Word bank

variegated	***serrated***	***lobular***	***pinnate***
venation	***needle***	***spiny***	

SCN 3-01a - I can identify living things using biological keys.
SCN 4-01a – I can use scientific vocabulary

Identifying Plants + Animals: Keys

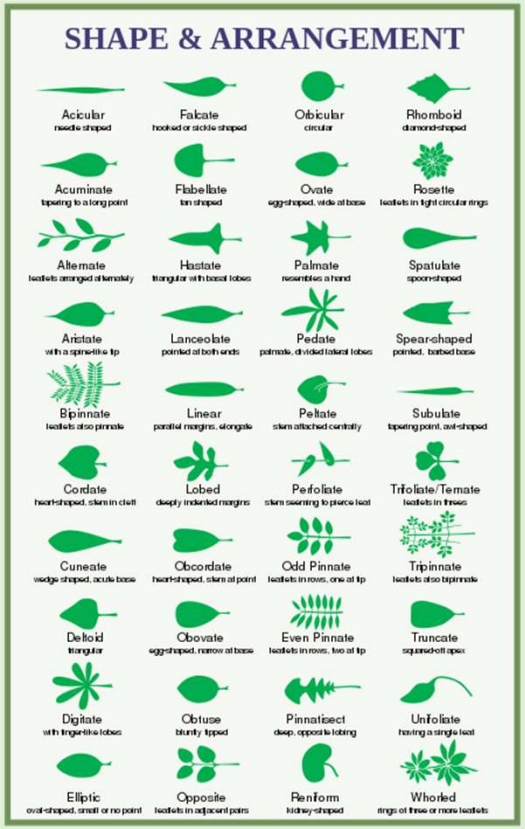
20/08/2025

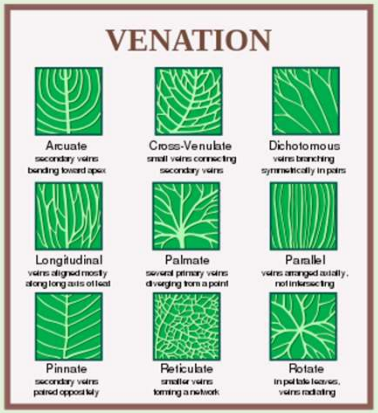
Page 17

Identifying animals seems straightforward…… but what about plants?

The features that plants have include: leaf colour, leaf shape, leaf arrangement, leaf surface, leaf edges, vein patterns, etc.

Using the slides, complete the table in your booklet





Identifying Plants: Keys

20/08/2025

Variegated leaves

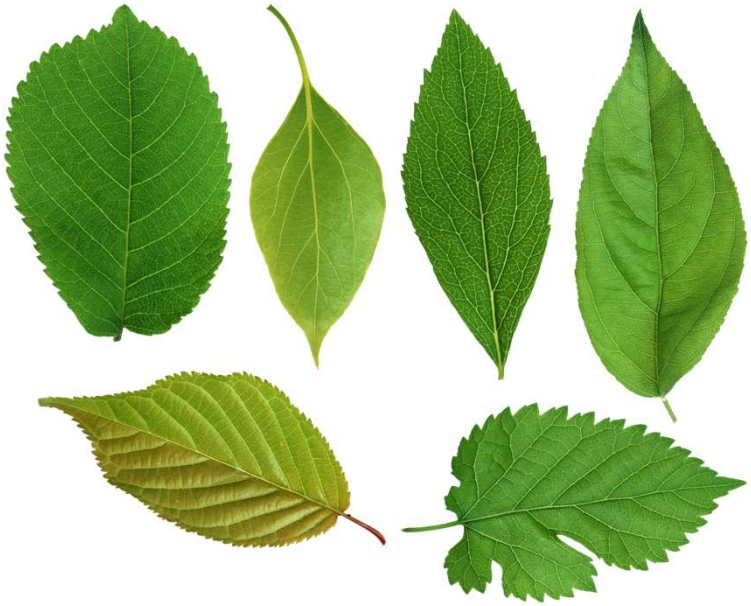
Leaves have more than one colour

Identifying Plants: Keys

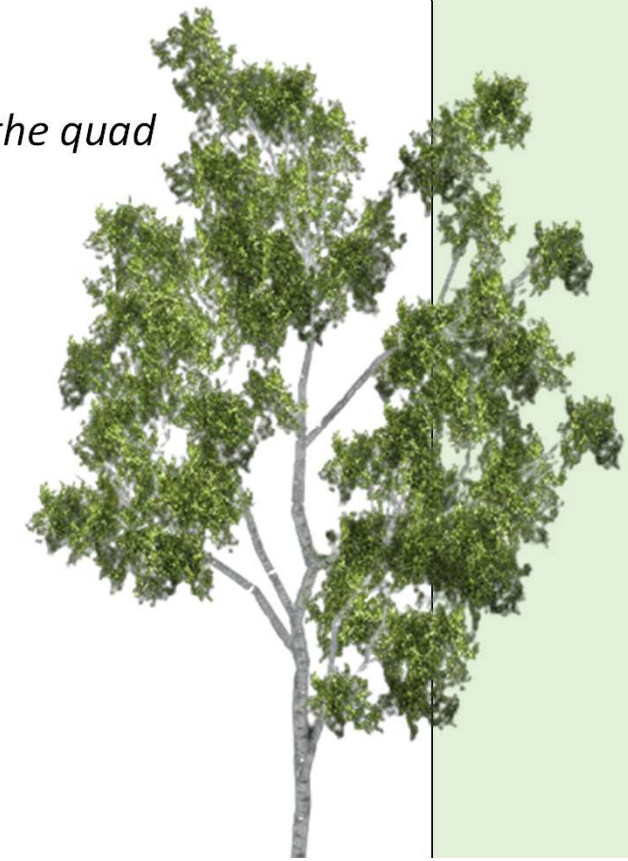
20/08/2025

serrated leaves

Leaves have edges like teeth!



There are birch trees in the quad with serrated leaves:



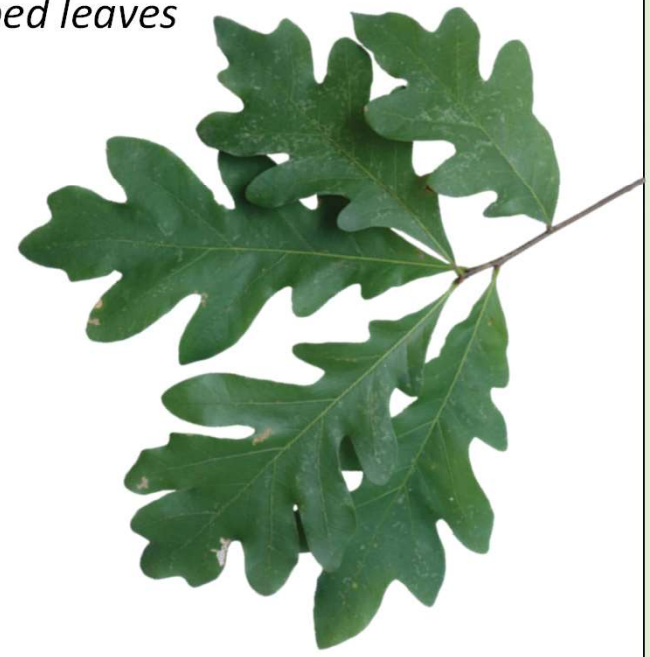
Identifying Plants: Keys

20/08/2025

lobular leaves

Lobular leaves have rounded edges

There are oak trees on the school grounds that have lobed leaves



Identifying Plants: Keys

20/08/2025

pinnate leaves

Have a midline and paired leaves like a feather

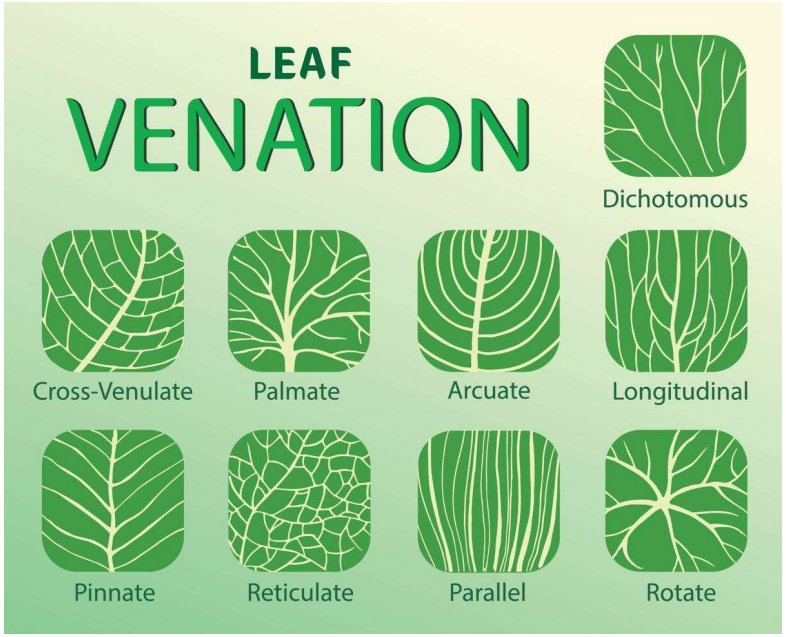
Rowan trees have pinnate leaves (also serrated!)

Identifying Plants: Keys

20/08/2025

Venation

Some leaves have visible veins



Sycamore leaves have "palmate" veins.
They are also lobular and can be serrated!!!

Identifying Plants: Keys

20/08/2025

Needle leaves

Trees with leaves that resemble needles and tend to stay on all year

Scots Pine can be found on school grounds

Identifying Plants: Keys

20/08/2025

Spiny leaves

Spiny leaves have sharp points on their edges.

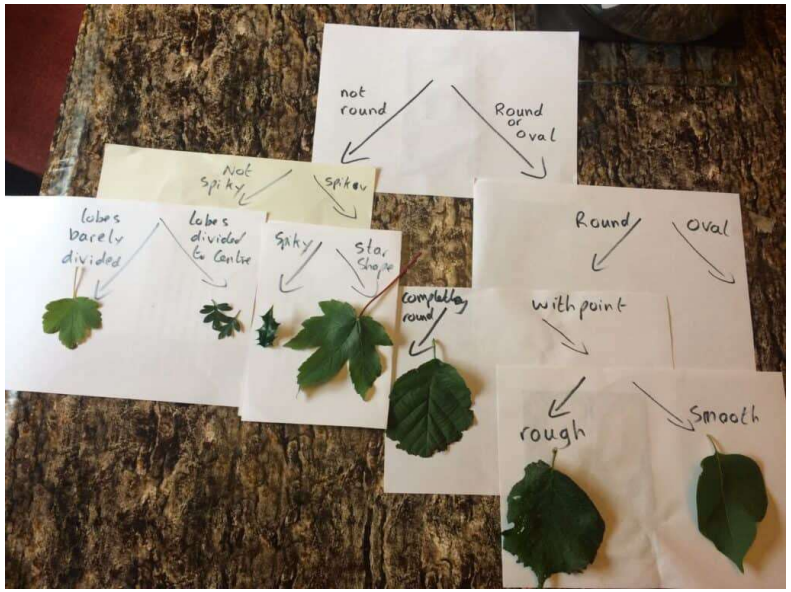
There are holly trees in the woodland at the rear of the school

Identifying Plants: Keys

20/08/2025

Activity Choice:

Outdoors
Collect 6-8 different leaves



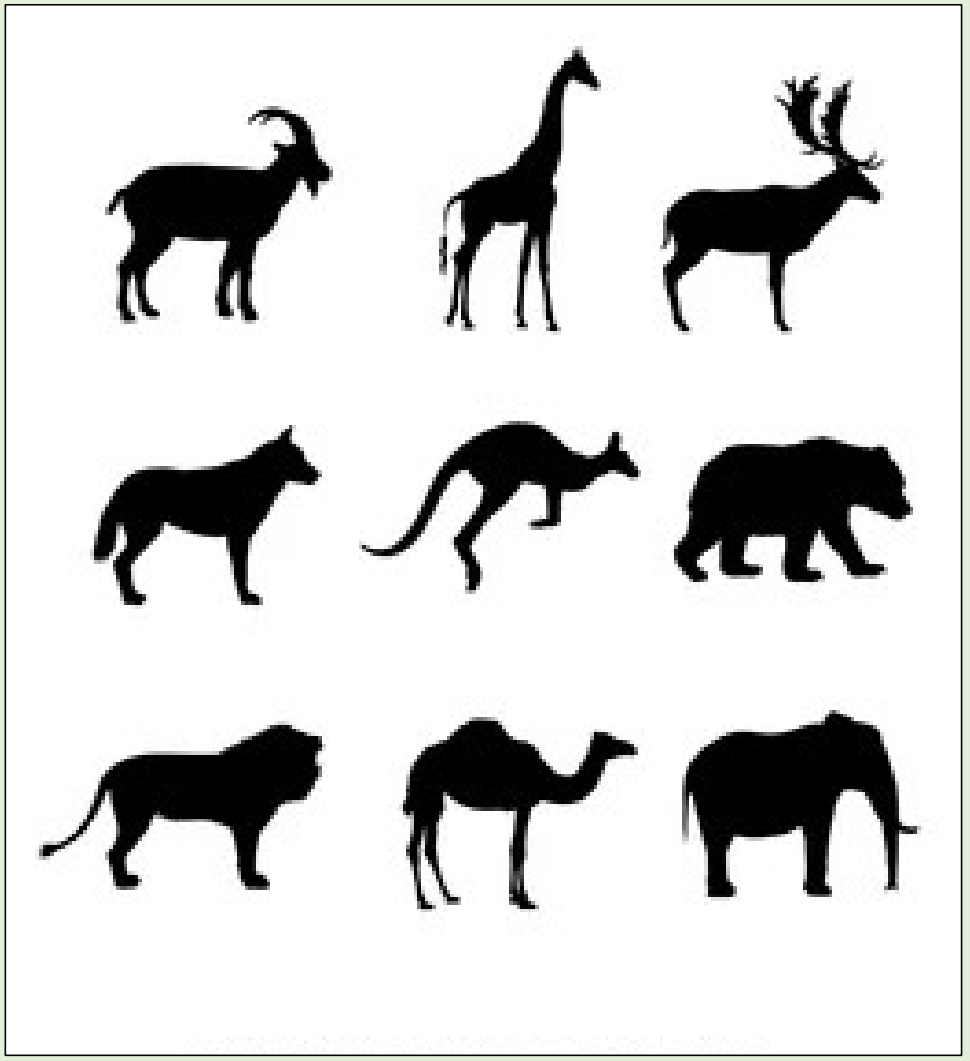
Indoors
Use leaf stencils to draw 6-8 different leaves

Plenary

One person is picked to be the mystery **animal** *(you picked this during starter activity)*

Use a random generator to select players. Each turn the player gets to ask **one question.** Only **yes/no** answers can be given.

Each player gets a turn until the mystery is solved. The winner gets to be the “animal” for the next round!



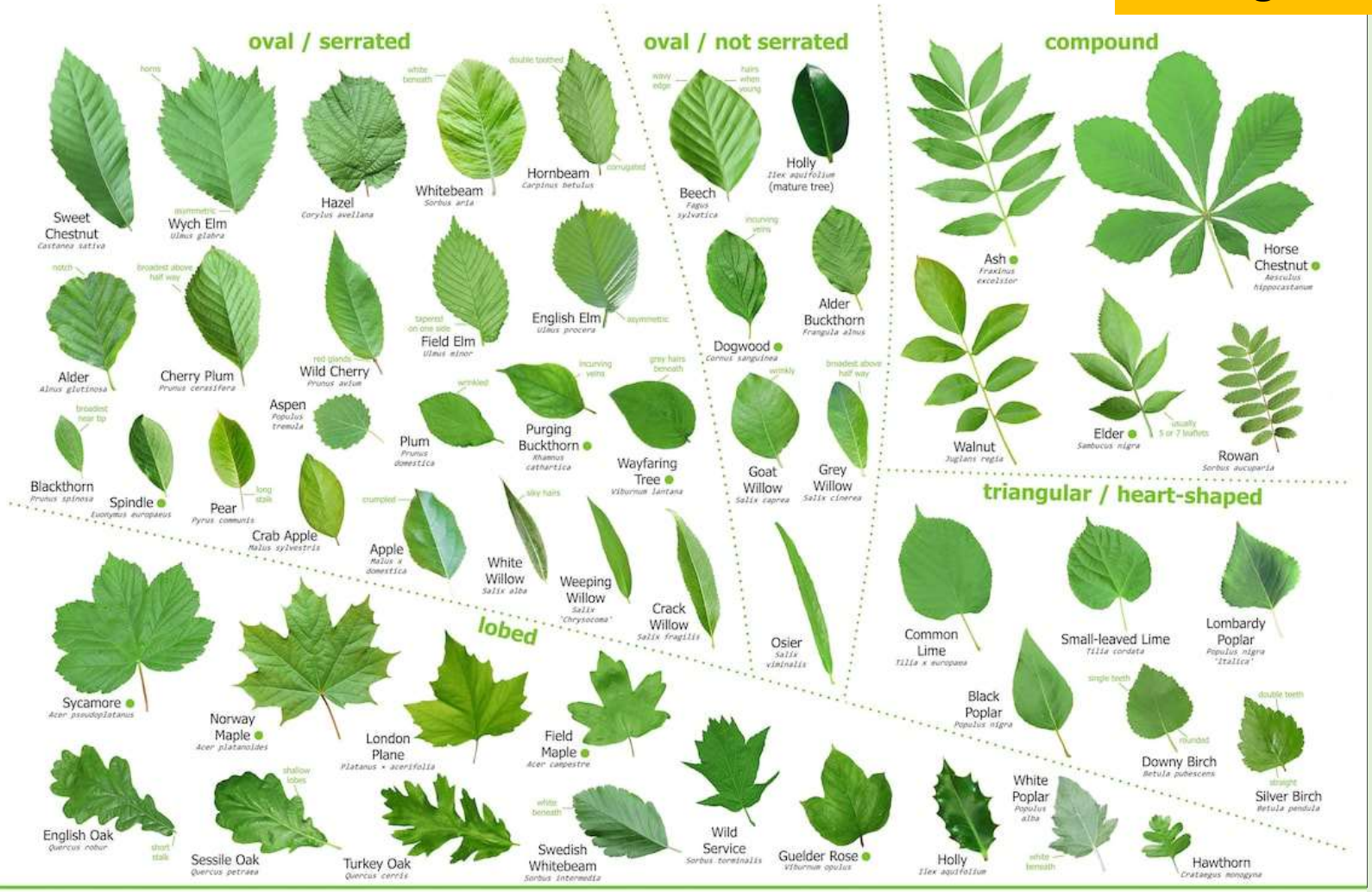
Plants

20/08/2025

Page 18

Starter:

Pick your favourite leaf. Write down two characteristics that you like about it! Use the words from Pg 17

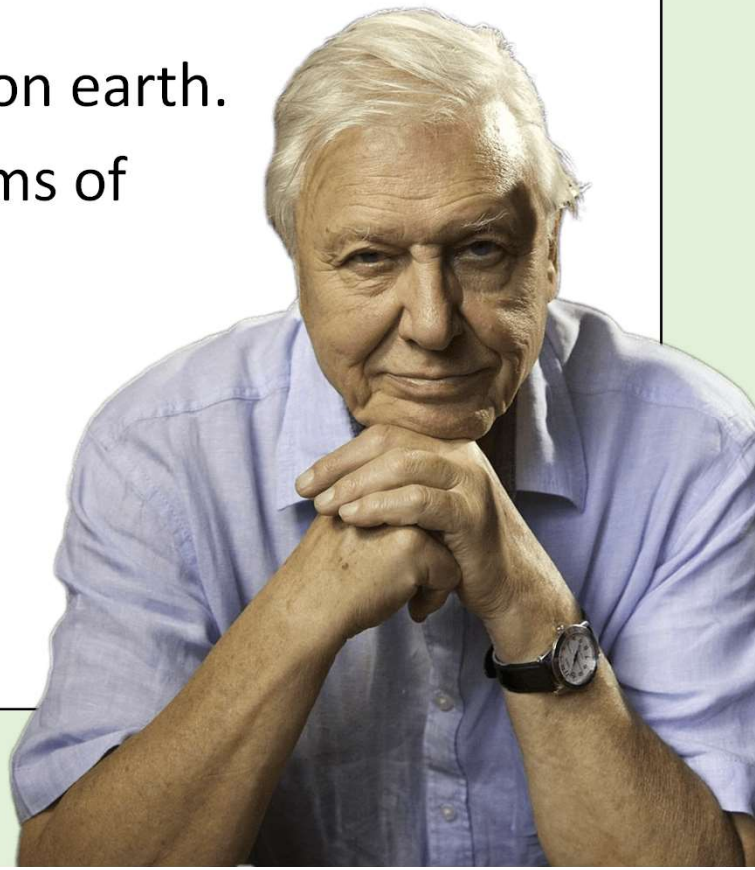


Plants

20/08/2025

Learning Intentions:

1. To identify why plants are vital to sustaining life on earth.
2. To describe the process of photosynthesis in terms of raw materials and products



Success Criteria

Tick me at the end if ***you can*** ...

- ❑ I can state why plants are vital to life on earth
- ❑ I can describe photosynthesis in terms of raw materials and products

Word bank

photosynthesis	*reactants/raw materials*	*oxygen*	*plants*
water	*carbon dioxide*	*sugars*	*starch*

SCN 3-02a - I have collaborated on investigations into the process of photosynthesis and I can demonstrate my understanding of why plants are vital to sustaining life on Earth.

Plants

20/08/2025

Quoting the legendary David Attenborough!!!

Watch the video carefully. You will have to fill in Attenborough's missing words in your notes!!!

https://www.bbc.co.uk/iplayer/episode/m0013cl5/the-green-planet-series-1-1-tropical-worlds

Quoting the legendary David Attenborough

1

The biggest living thing that exists on this planet is a **plant**, like this giant sequoia tree in **California**.

Plants, whether they are **enormous**, like this one, or **microscopic**, are the basis of all life, including ourselves.

We **depend** upon them for every mouthful of **food** that we eat and every lungful of **air** that we breathe.

From first 40 seconds

Plants

20/08/2025

2

Throughout this forest, plants are competing ferociously with one another to claim the **light.** The battle is at its fiercest on the forest floor where only **2%** of the sunlight filters through.

From 5:10

3

That fuel is created in a plant's **leaves**, as they soak up the sun. It's a process called photosynthesis…..
A **chemical reaction** that is the basis of all life on Earth.

Leaves are covered by thousands of microscopic pores called stomata. When open, they extract **carbon dioxide** from the air, and, using **energy** from the sun, combine it with nutrients to build the plant's tissues. And critically for us, the process releases the **oxygen** that we and all animals need in order to breathe.

From 11:50

Plants

20/08/2025

Read over the speech bubbles. Your next task will involve two skills:

1. **Memorising facts**
2. **Understanding information (sometimes called “interpreting”)**

Plants

20/08/2025

Page 19

Memorising facts:

Question 1: What is the biggest living thing that exist on our planet?

Question 2: Why are plants important?

Question 3: What is the chemical process that allows plants to make food?

Question 4: What percentage (%) of light filters through the forest?

Plants

20/08/2025

Understanding information:

Question 5: The process that plants use to make food is an example of a chemical reaction. Chemists call the materials that are needed for a chemical reaction “reactants”. Biologists sometimes call reactants “raw materials”. What might you call the reactants/raw materials in Home Economics?

Plants

20/08/2025

Understanding information:

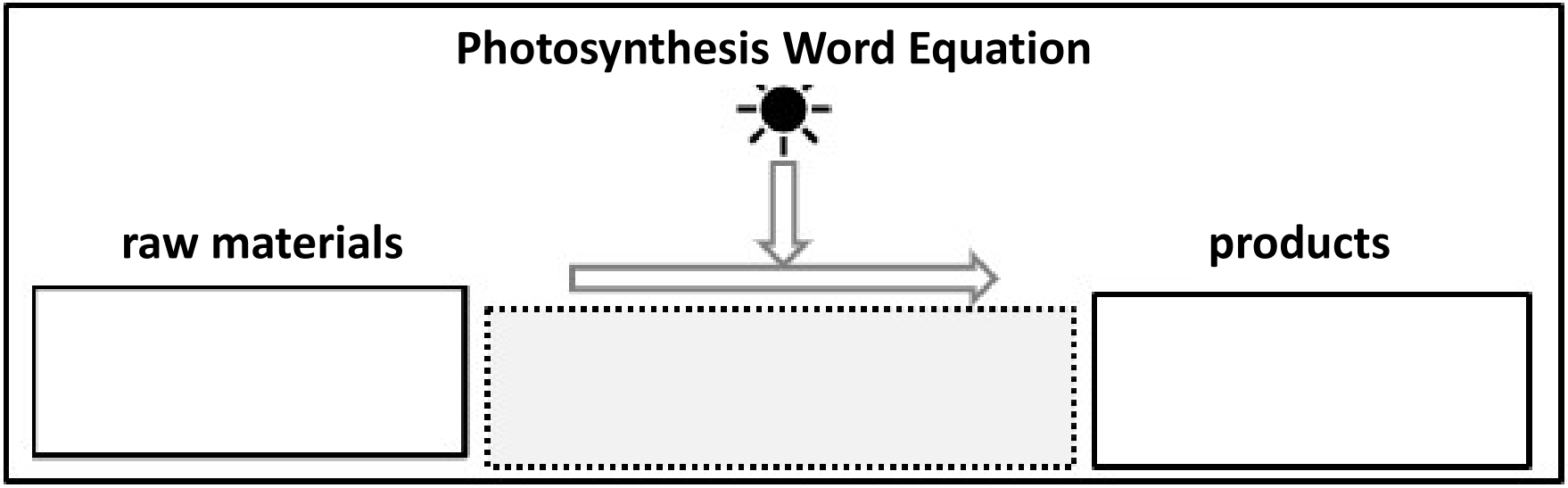
Question 6: What are the raw materials plants use in photosynthesis?

Question 7: Where does the energy come from for photosynthesis?

Question 8: Is energy a raw material? Why?

Question 9: What we are left with after a reaction takes place is called a "product". What are the two products of photosynthesis?

Question 10: Complete the word equation below to show what you have learned about photosynthesis (the shaded box is for anything extra you want to say about photosynthesis that will impress your teacher!!):

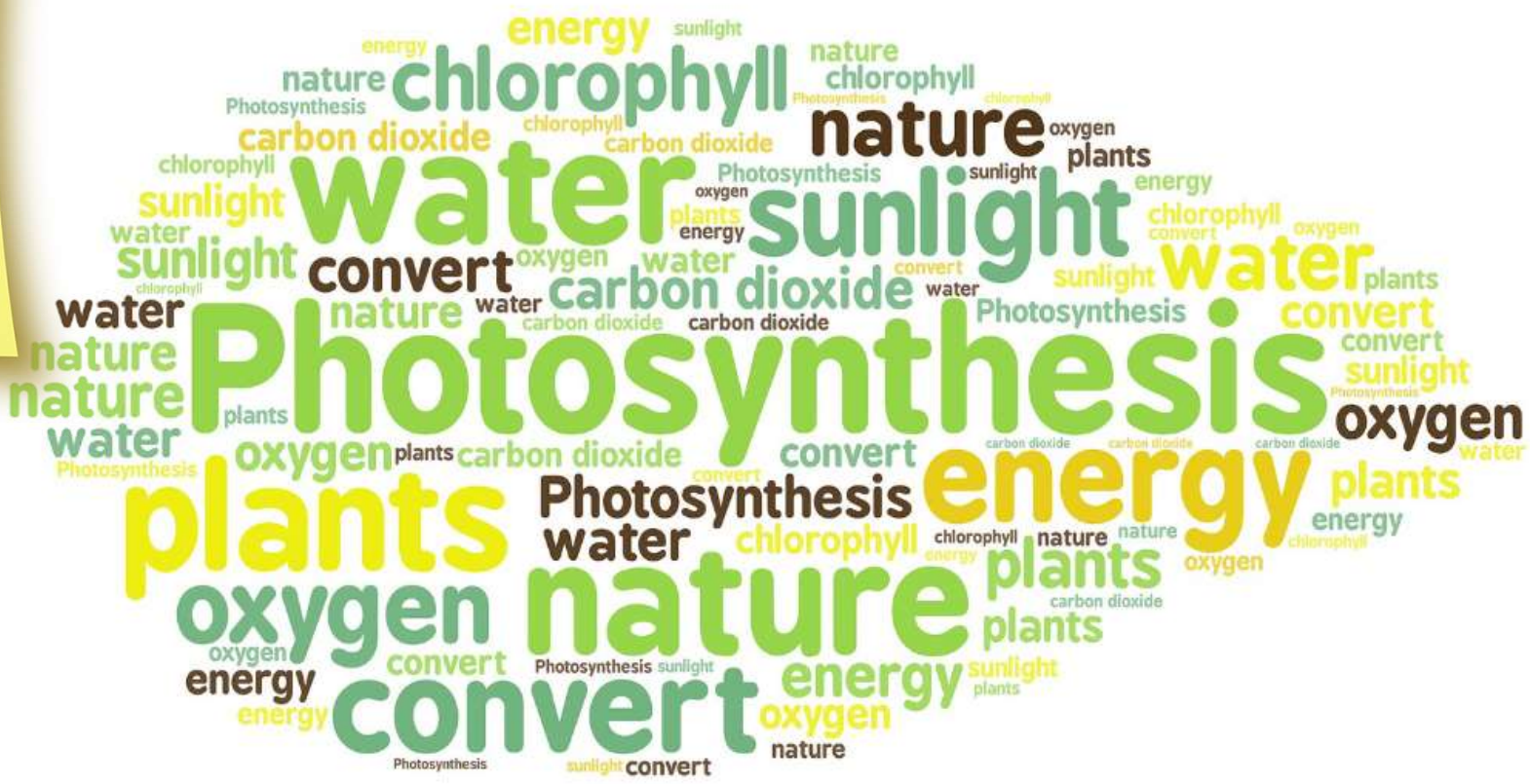


Plants

20/08/2025

Post-it Plenary:

Use the word cloud to write three facts about photosynthesis:



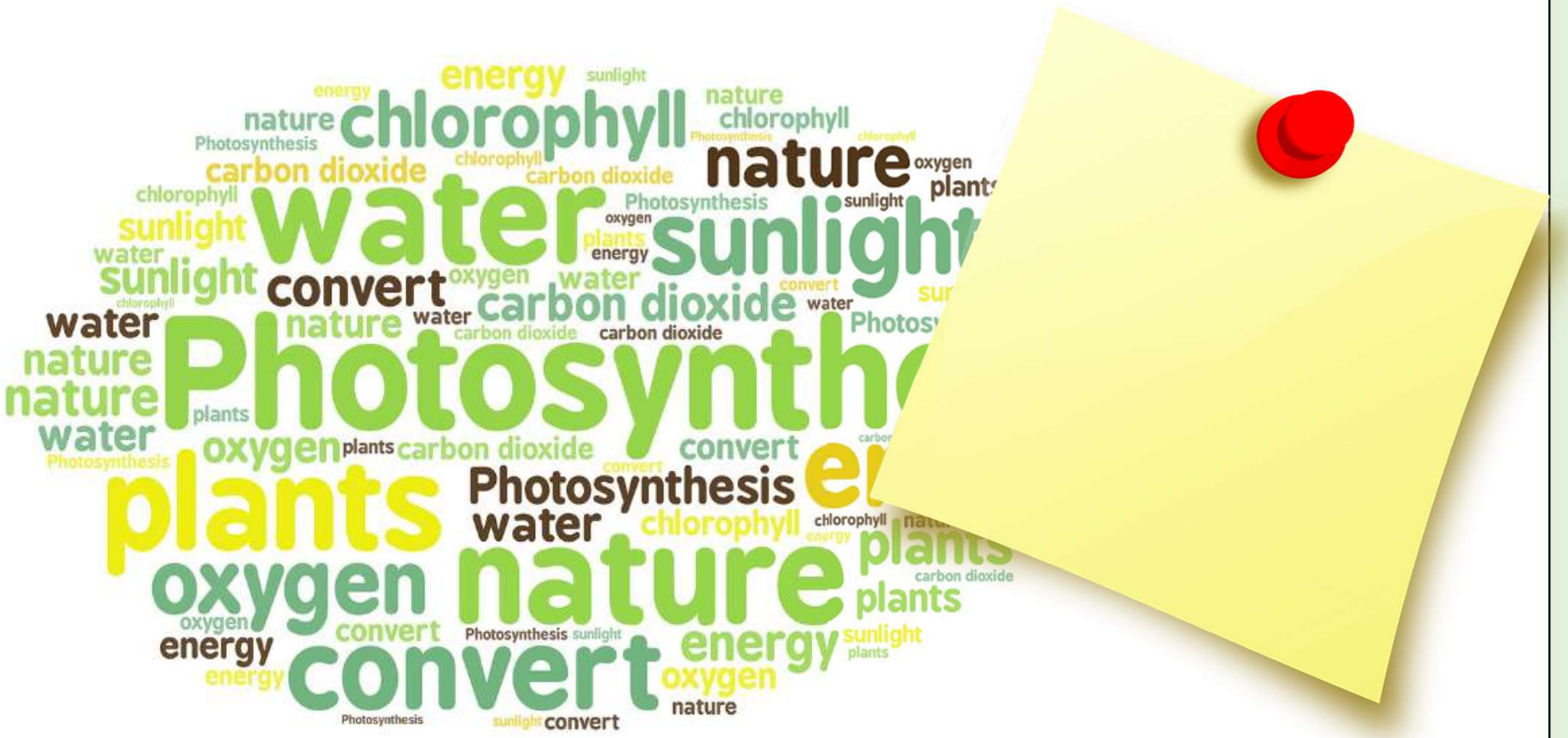
Plants 2

20/08/2025

Page 20

Starter:

What three facts did you write down from the last lesson?

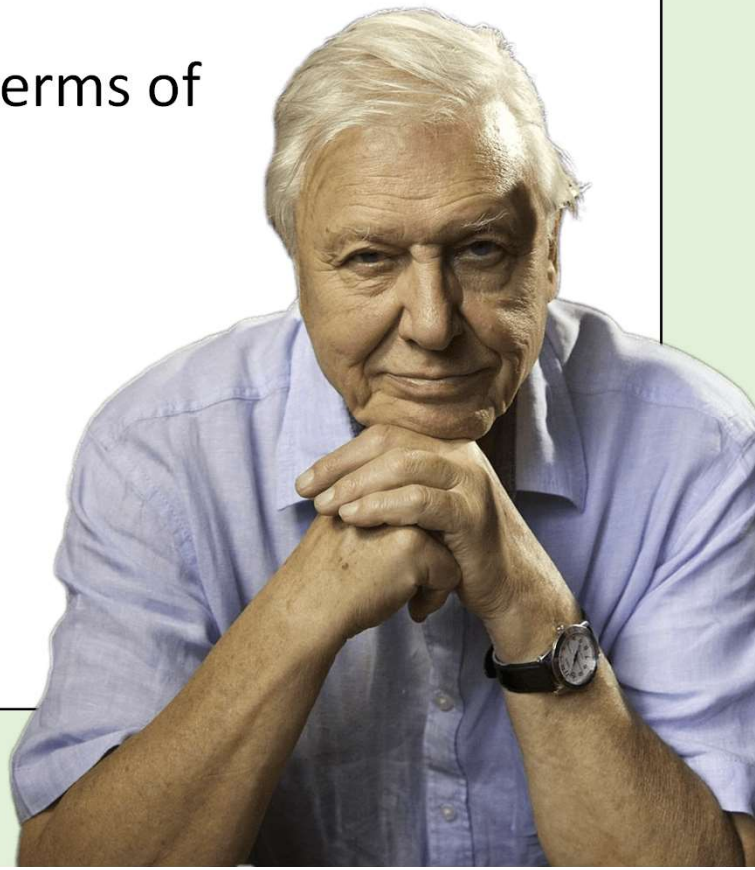


Plants 2

20/08/2025

Learning Intentions:

1. To describe the process of photosynthesis in terms of raw materials and products
2. To test leaves for starch



Plants 2

20/08/2025

Tick me at the end if
you can …

Success Criteria

- ❑ **I can describe photosynthesis in terms of raw materials and products**
- ❑ **I have tested leaves for starch**

Word bank

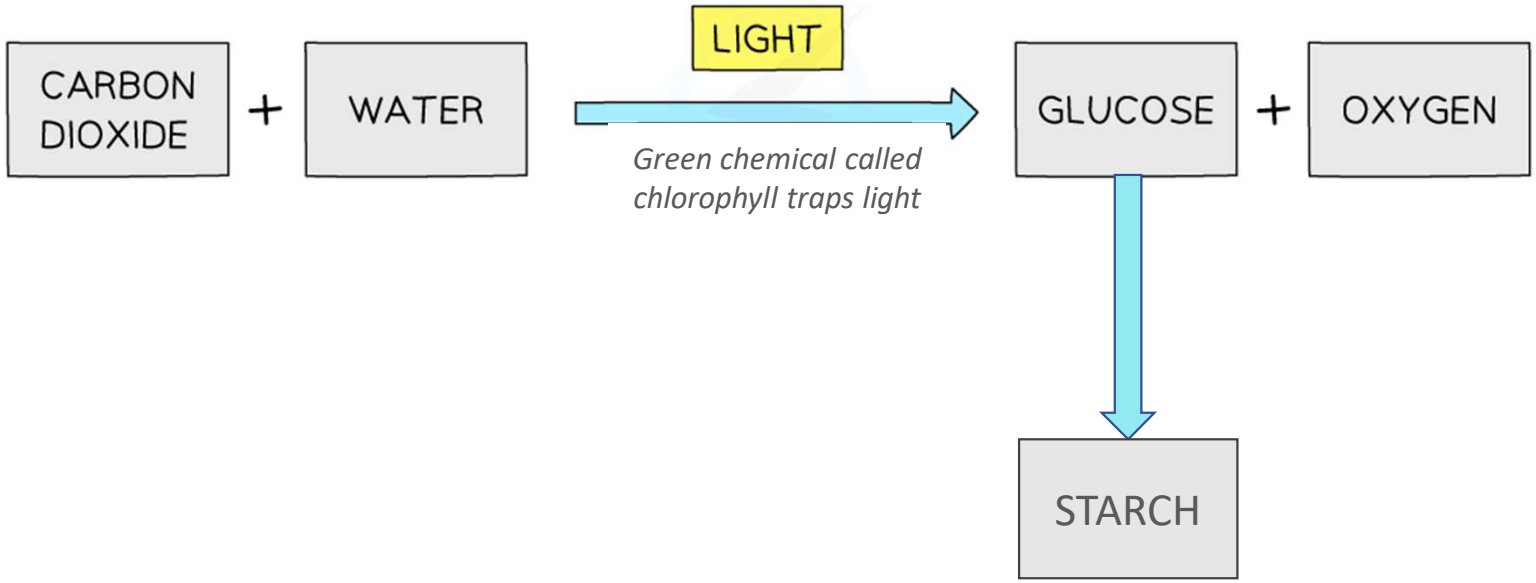
photosynthesis ***water*** ***carbon dioxide*** ***iodine*** ***starch*** ***glucose***

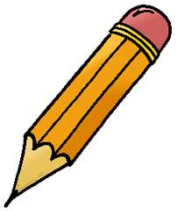
SCN 3-02a - I have collaborated on investigations into the process of photosynthesis and I can demonstrate my understanding of why plants are vital to sustaining life on Earth.

Plants 2

20/08/2025

When a plant photosynthesises, it produces a sugar called **glucose**. It can't use all of the glucose at once, so it joins the sugar molecules together to make a storage carbohydrate called **starch**.

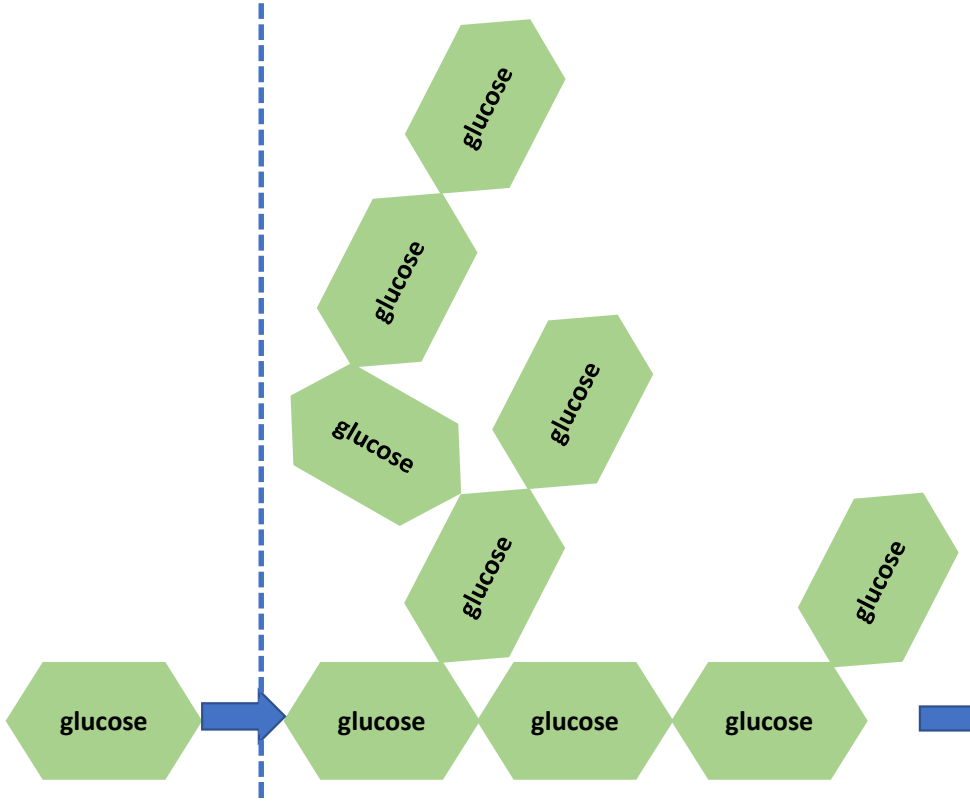


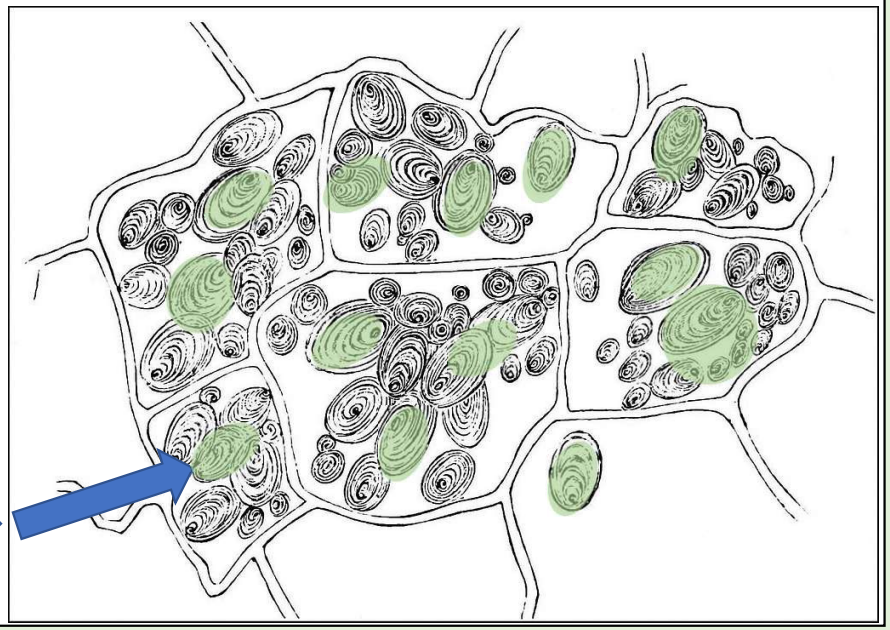


Glucose Molecule

Starch Molecule

Starch Grains (inside leaf cells)





Plants 2

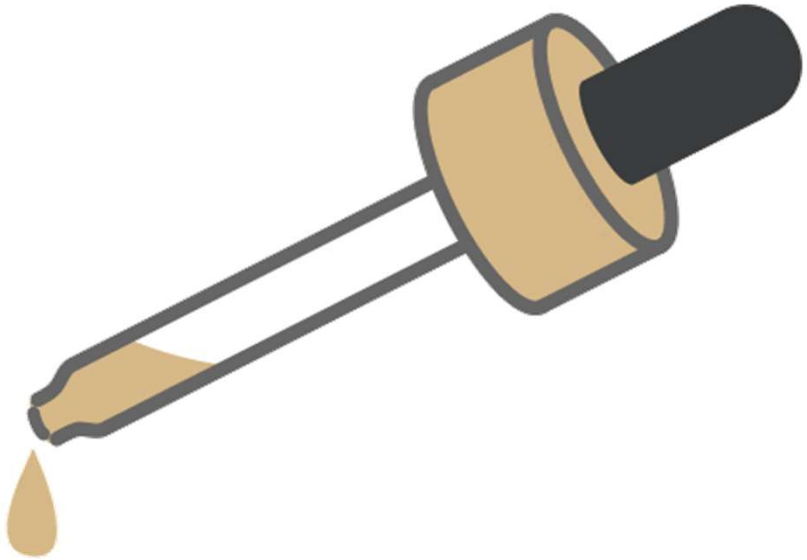
20/08/2025

Page *

We can prove that photosynthesis is taking part in green leaves by testing them for starch.

Can you remember, in S1, what chemical we used to test for starch?

How does it show a positive result?



We use **Iodine**. Iodine goes **blue-black** when in the presence of starch.

Plants 2: Experiment

20/08/2025

Aim: To test different parts of a leaf for starch.

Equipment needed:

- Eye protection
- A variegated geranium leaf
- Beaker of boiling water (250cm^3)
- Ethanol
- Forceps (tweezers)
- Boiling tube
- Glass rod
- White tile

Plants 2: Experiment

20/08/2025

Method

1. Collect your leaf and place it into your beaker of boiling water. Leave it in the boiling water for about 1 minute and remove using your forceps.
2. Drop your leaf into a boiling tube and push to the bottom using a glass rod.
3. Add enough ethanol to the boiling tube to cover the leaf.
4. Place the boiling tube in the beaker of hot water.
5. The ethanol will boil and the green chlorophyll will be removed from the leaf. Leave for 5 minutes.
6. Remove the leaf from the boiling tube using forceps and rinse in cold water.
7. Place the leaf on to a white tile.
8. Add a few drops of iodine to cover the leaf.
9. Leave for a few minutes and record results in your results table.

Plants 2: Experiment

20/08/2025

Results:

Part of Plant	Starch present? (✓ / ✗)
Green	
White	

Plants 2: Experiment

20/08/2025

Conclusion:

What part of the plant contained starch? Why?

Evaluation:

How could we improve the results of this experiment?

Plants 3: Fertilisers

20/08/2025

Page 21

Starter:

What do farmers put on fields?

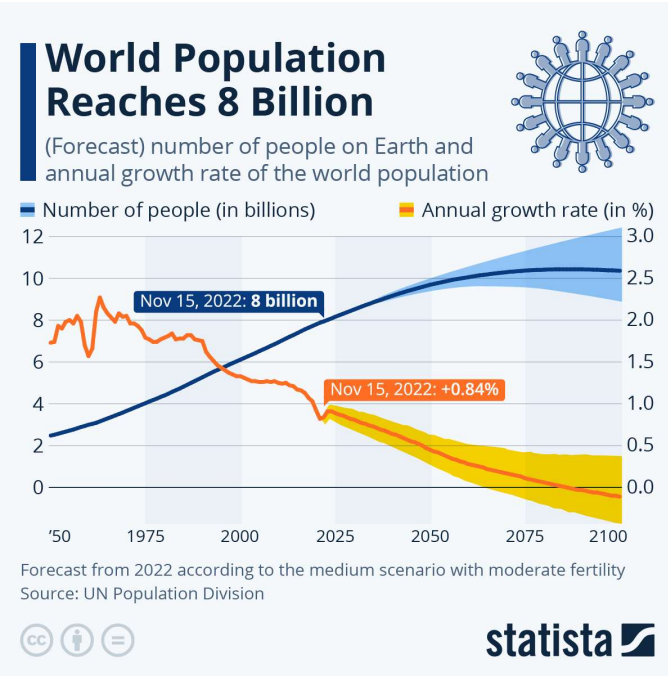
Why?

Plants 3: Fertilisers

20/08/2025

Learning Intentions:

1. To investigate chemical fertilisers
2. To evaluate the impact on food production



Plants 3: Fertilisers

20/08/2025

Tick me at the end if
you can …

Success Criteria

- ❑ **I can state the effect of fertilisers on crop growth**
- ❑ **I can suggest how global food production may be improved**

Word bank

photosynthesis ***manure*** ***fertiliser*** ***nitrogen*** ***phosphorus*** ***potassium***

SCN 3-03a - Through investigations and based on experimental evidence, I can explain the use of different types of chemicals in agriculture and their alternatives and can evaluate their potential impact on the world's food production

Plants 3: Fertilisers

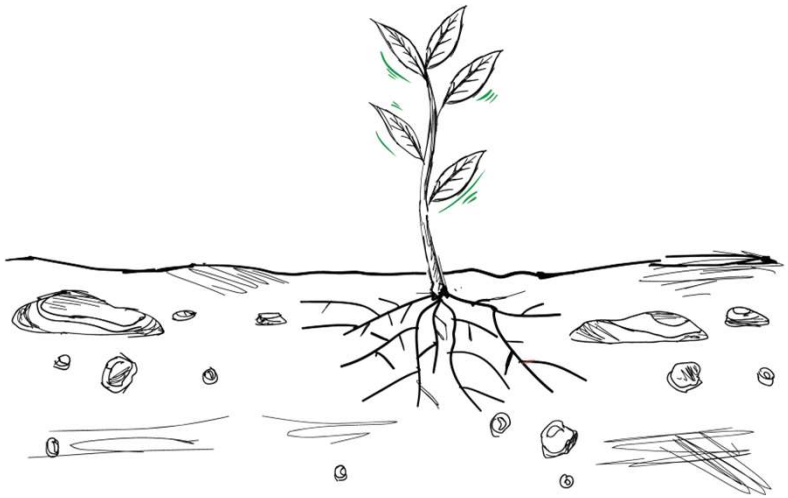
20/08/2025

Fertilisers provide the minerals needed for healthy growth in plants.

As plants grow, they absorb minerals from the soil through their **roots**.

When crops are **harvested**, nitrogen is removed from the soil (in the protein of the plant products). Adding fertilisers to the soil can replace soil nitrogen. This makes the soil **fertile** again, allows more plant growth to occur and **increases the yield** of the next crop.

Fertilisers can be manmade **chemicals** or **natural** organic waste materials (manure and compost).



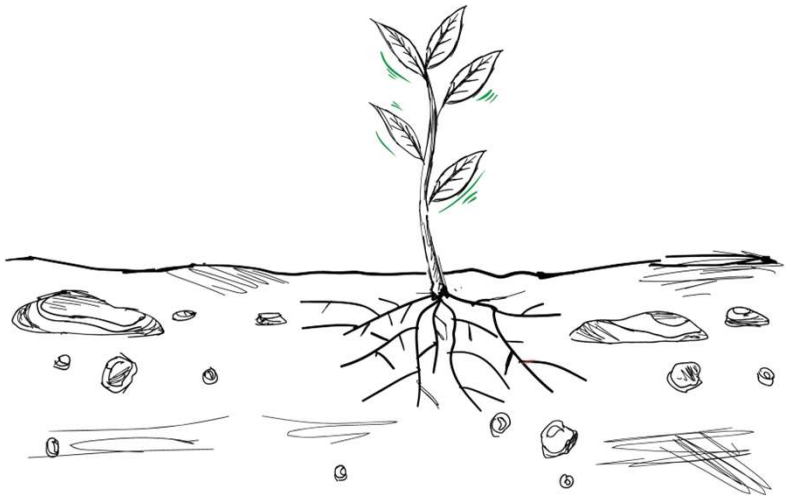
Plants 3: Fertilisers

20/08/2025

Literacy task:

Use the passage in your notes to write a creative story about how plants use fertilisers to grow.

Use the diagram to help



Plants 3: Fertilisers Experiment

20/08/2025

Literacy task:

Use the passage in your notes to write a creative story about how plants use fertilisers to grow.

Use the diagram to help

Plants

20/08/2025

Page *

Learning Intentions:

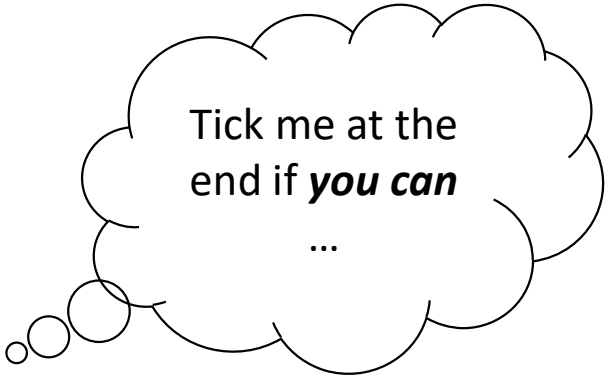
1. x

Plants

20/08/2025

Success Criteria

❑ **x**



Word bank

x

Photosynthesis

20/08/2025

Page *

Starter:

x

Photosynthesis

20/08/2025

Learning Intentions:

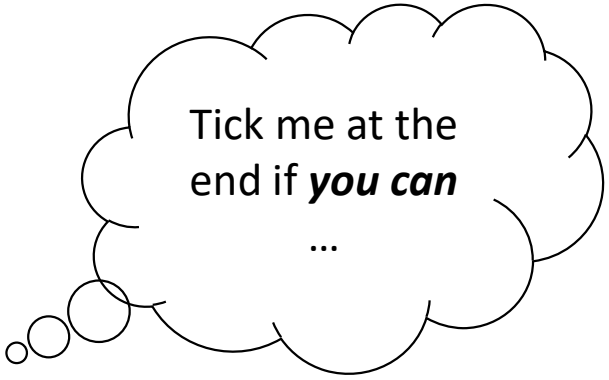
1. x

Photosynthesis

20/08/2025

Success Criteria

❑ **x**



Word bank

x

Photosynthesis

20/08/2025

Page *

Plenary:

x

Plants: Life on Earth

20/08/2025

Page *

Starter:

WALL-E trailer

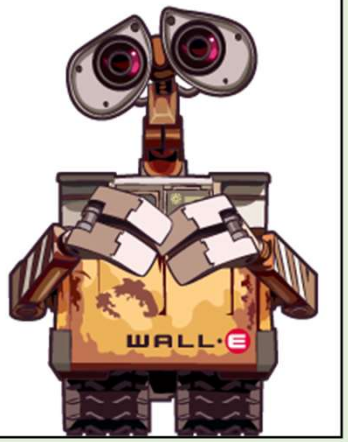
https://www.youtube.com/watch?v=CZ1CATNbXg0

WALL-E Finds the last plant in the world

https://www.youtube.com/watch?v=veySlNgGMO0

What do the creators of WALL-E think that life on earth will be like with no plants?

What is the significance of WALL-E finding a plant on Earth?



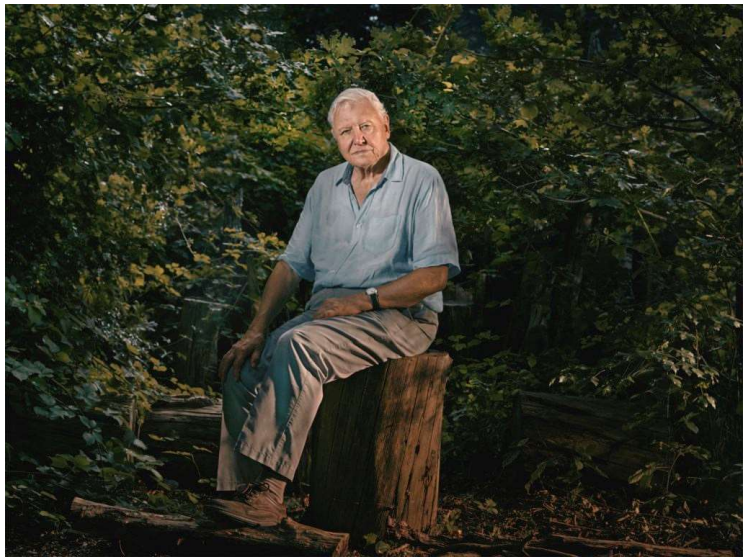
Plants: Life on Earth

20/08/2025

Page *

Starter:

x



Plants: Life on Earth

20/08/2025

Page *

Learning Intentions:

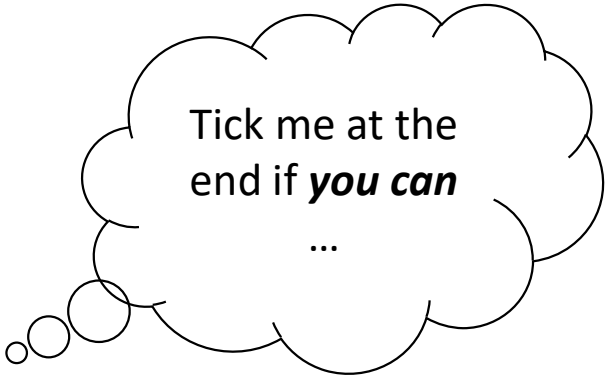
1. x

Plants: Life on Earth

20/08/2025

Success Criteria

❑ **x**



Word bank

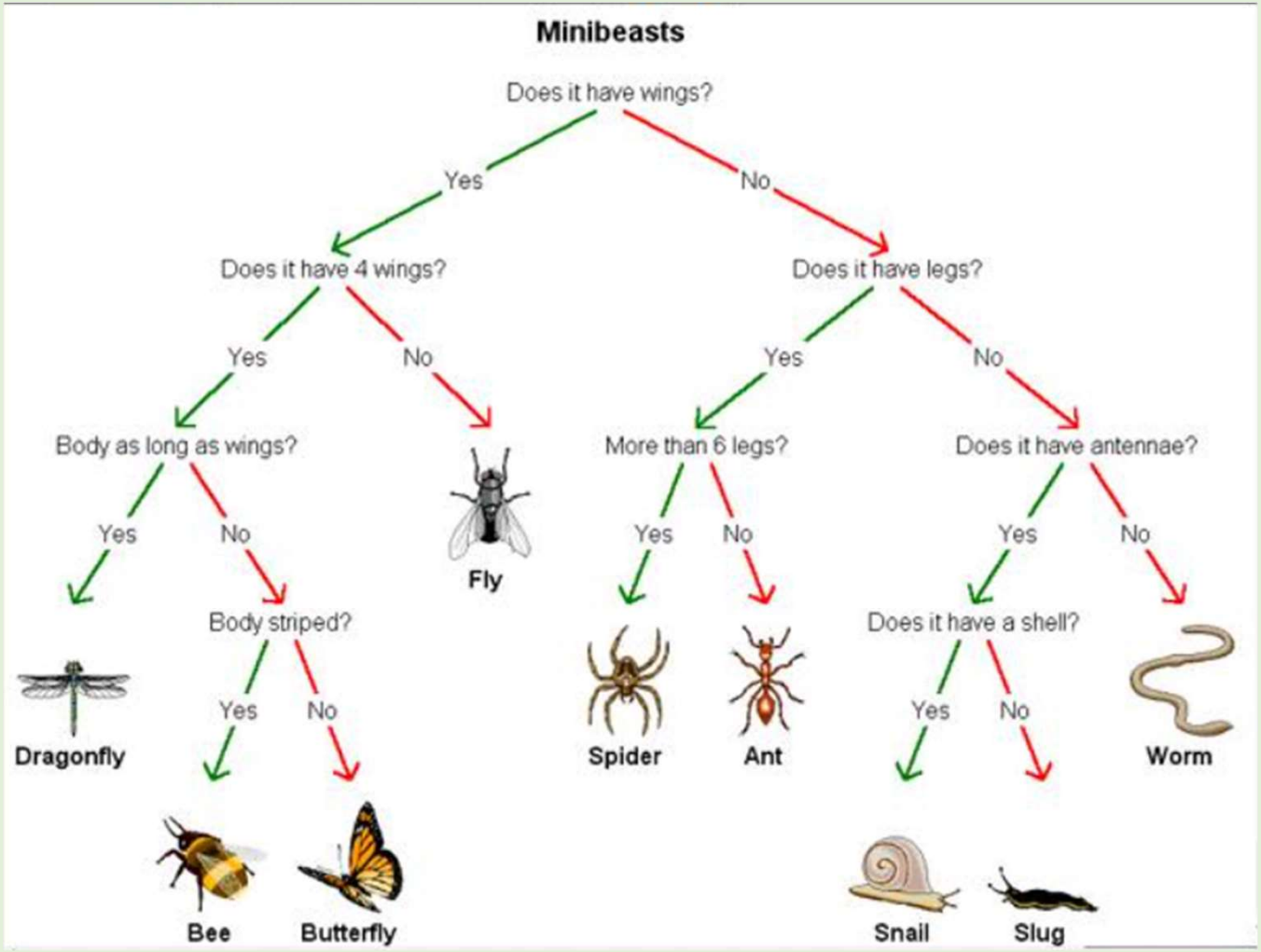
x

Plants: Life on Earth

20/08/2025

Plenary:

x


Minibeasts
Does it have wings?
Yes
No
Does it have 4 wings?
Does it have legs?
Yes
No
Yes
No
Body as long as wings?
More than 6 legs?
Does it have antennae?
Yes
No
Yes
No
Yes
No
Fly
Body striped?
Does it have a shell?
Yes
No
Yes
No
Dragonfly
Spider
Ant
Worm
Bee
Butterfly
Snail
Slug

Dichotomous Key for Animals

What type of animal is that?

It has a backbone

It has no backbone

It is warmblooded

It is coldblooded

It has legs

It has no legs

It has no feathers

It's a mammal

It has feathers

It's a bird

It has antennae

It has no antennae

It is an arachnid

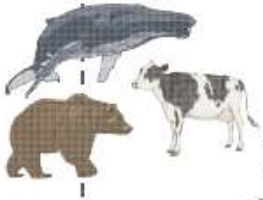
It has a shell

It's a mollusc

It has no shell

It has wings

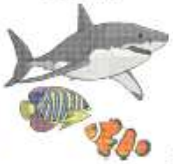
It's an insect



It lives on land

It lives in the ocean

It's a fish



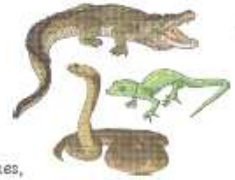
It can sting

It's a coelenterate

It can't sting

It has scales

It's a reptile



It has slimy skin

It's an amphibian

It has no wings

This is the biggest group of animals and includes:

marsupials, that have a pouch

monotremes, that lay eggs

It lives in the water

It's a crustacean

It lives on land

It's a myriapod

It is spiny

It's an echinorderm

It is soft

It's a worm

Ladybird detective

wildlife watch

7-spot ladybird

2-spot ladybird

14-spot ladybird

Harlequin ladybird

22-spot ladybird

Pine ladybird

Orange ladybird

Cream-spot ladybird

Kidney-spot ladybird

Eyed ladybird

www.wildlifewatch.org.uk

Credits: 7-spot ladybird (c) Jon Hawkins / 2-spot ladybird, 14-spot and harlequin ladybird (black) (c) Amy Lewis / Harlequin ladybird (orange), 22-spot ladybird, cream-spot ladybird, orange ladybird and pine ladybird (c) Rachel Scopes / Kidney-spot ladybird (c) Les Binns / Eyed ladybird (c) Richard Burkmar

Level 2 Learning Outcomes & Benchmarks

SCN 2-01a - 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.

- Classifies living things into plants (flowering and non-flowering), animals (vertebrates and invertebrates) and other groups through knowledge of their characteristics.
- Begins to construct and use simple branched keys which can be used to identify particular plants or animals.
- Identifies characteristics of living things and their environment which have contributed to the survival or extinction of a species.
- Describes how some plants and animals have adapted to their environment, for example, for drought or by using flight.

SCN 2-02a - I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs.

- Describe how energy flows between plants and animals in more complex food chains and webs and ecosystems, using vocabulary such as 'producers', 'consumers' and 'herbivore'.

SCN 2-02b - Through carrying out practical activities and investigations, I can show how plants have benefited society.

- Relates findings from practical investigations to describe how plants have benefited society, for example, in medicine, dyes, fuels, construction, prevention of soil erosion and by influencing the balance of gases in the air.

SCN 2-03a - 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.

- Collaborates with others to present a reasoned argument, based on evidence, of the risks and benefits of using fertilisers, demonstrating understanding of the underlying scientific concepts.

Level 4 Learning Outcomes & Benchmarks

SCN 4-01a - I understand how animal and plant species depend on each other and how living things are adapted for survival. I can predict the impact of population growth and natural hazards on biodiversity

- Describes how plants and animals depend on each other for food, shelter and pollination, using scientific vocabulary such as 'population', 'community' and 'species'.
- Explains the possible effects of removal or addition of species on food webs and biodiversity.
- Summarises research findings to provide examples of structural, physiological and behavioural adaptations which lead to species survival.

SCN 4-02a - I have propagated and grown plants using a variety of different methods. I can compare these methods and develop my understanding of their commercial use.

- Compares natural and artificial techniques to propagate plants, for example, seeds, bulbs and cuttings, and suggests commercial uses such as food production and food security.

SCN 4-03a - Through investigating the nitrogen cycle and evaluating results from practical experiments, I can suggest a design for a fertiliser, taking account of its environmental impact.

- Describes the nitrogen cycle and explains the importance of each stage.
- Explores and explains the possible impact of the use of fertilisers, for example, algal blooms.

TOPICAL SCIENCE:

SCN 4-20a I have researched new developments in science and can explain how their current or future applications might impact on modern life.

- Researches and communicates developments in science, explaining how current and future applications might impact on life.
- Demonstrates increasing understanding of how the transferrable skills developed through the sciences are used in a wide variety of jobs including science, technology, engineering and mathematics (STEM) careers.

SCN 4-20b Having selected scientific themes of topical interest, I can critically analyse the issues, and use relevant information to develop an informed argument.

- Selects and analyses scientific content of topical interest from a range of sources, including the media.
- Identifies examples of bias in sources and justifies decisions in separating fact from opinion.
- Critically analyses a scientific issue and gives consideration to the ethical, moral, environmental, social or political implications of the scientific theme selected to develop an informed argument.