BLENHEIM PALACE
EDUCATION

This is an introduction to the Blenheim Walled Garden.

This module is a science-orientated visit around the kitchen garden.
Topics include Trees, Butterflies and Bees, Materials,
Food chains, and Seasons.

"A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people."

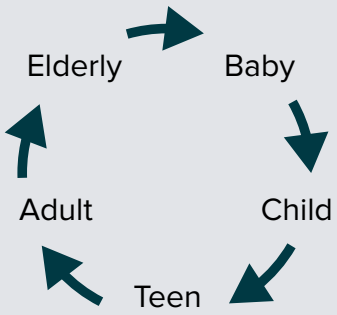
Franklin D. Roosevelt, February 1937

Living things and life cycle

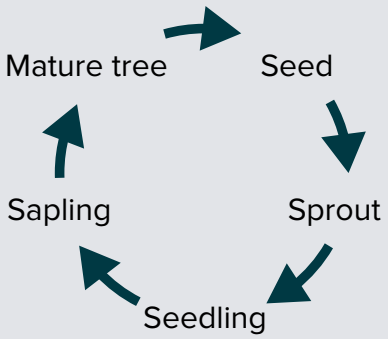
Humans, plants, and animals are living things.

All living things need **air, water** and **food** to live, to grow and to stay alive. All living things start **small** and **grow** into **bigger** creatures.

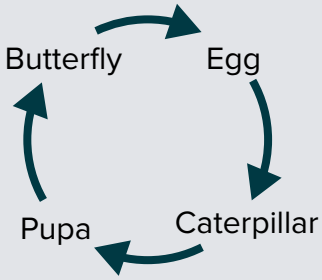
Human being



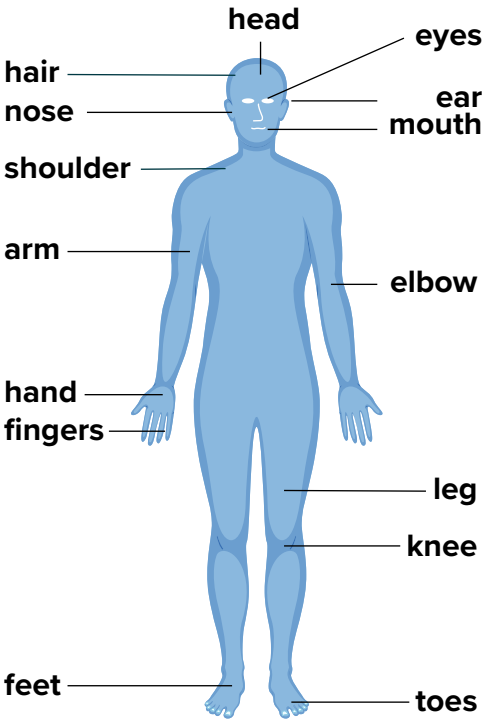
Tree



Butterfly



Human anatomy



We **see** with our eyes.

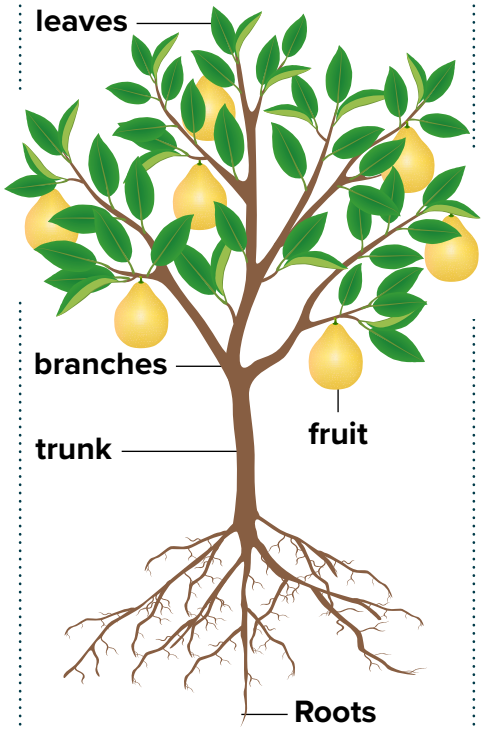
We **smell** with our nose.

We **taste** with our tongue and **eat** with our mouth.

We **hear** with our ears.

We **feel** with our skin through our hands, arms, feet, legs.

Structure of a tree

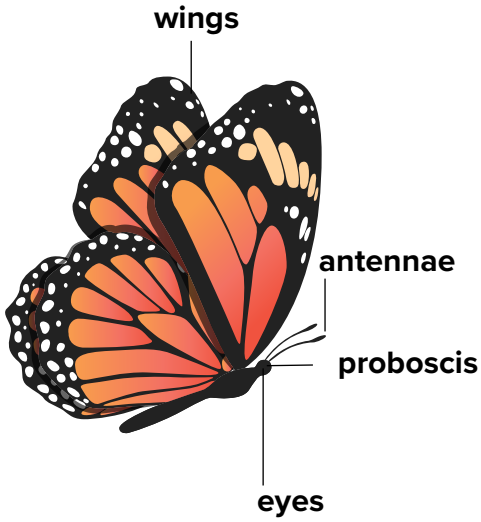


A tree will absorb **water** with its **roots**.

A tree will breathe **air** with its **leaves.**

A tree will absorb **food** (nutrients) from the soil with its **roots**, and it will absorb energy from the sunlight with its **leaves.**

Anatomy of a butterfly



A butterfly will **see** with its two **eyes.**

A butterfly will **smell** with its two ears (called **antennae**).

A butterfly will **taste** with its six **feet** and **eat** with its **nose** (called proboscis).

A butterfly will **hear** with its **wings.**

A butterfly will **feel** with the **hair** on its body.

Plants

There is a special tree in the car park at the Walled Garden. His name is Freddie. It is a 600-year-old oak tree.



Q: What type of tree is an oak tree?

A: An oak tree is a **deciduous** tree.

Q: What is a deciduous tree?

A: It's a tree that sheds its leaves every year.

Q: Do you know other deciduous trees?

A: Maple, Elm, Beech, Birch, Ash, Willow, Poplar, Hornbeam

The Marlborough Maze was planted in 1987. It's the second largest yew hedge maze.



Q: What type of tree is yew?

A: Yew is an **evergreen** tree.

Q: What is an evergreen tree?

A: It's a tree that does not shed its leaves. It's a tree that keeps its leaves all year long.

Q: Do you know other evergreen trees?

A: Pine, Cedar, Cypress, Spruce.

Growing plants

Trees grow from seeds. They need water and light to grow into mature trees. Some trees grow well in cold temperatures, other trees grow better in warm temperatures.

Trees through the seasons

A seasonal change of temperature will make deciduous trees shed their leaves.

Q: What happens to the deciduous trees through the seasons?

A: Spring: The buds come out.

A: Summer: The leaves come out.

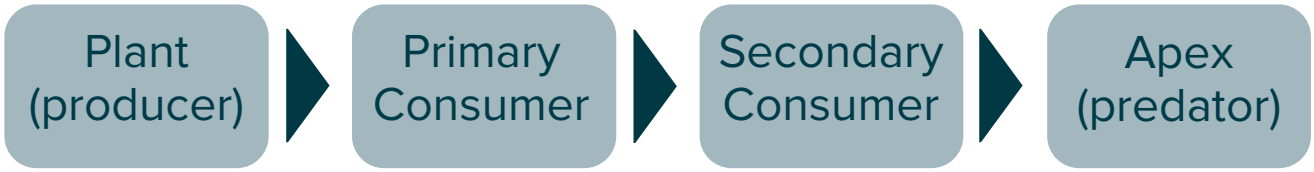
A: Autumn: The leaves change colour.

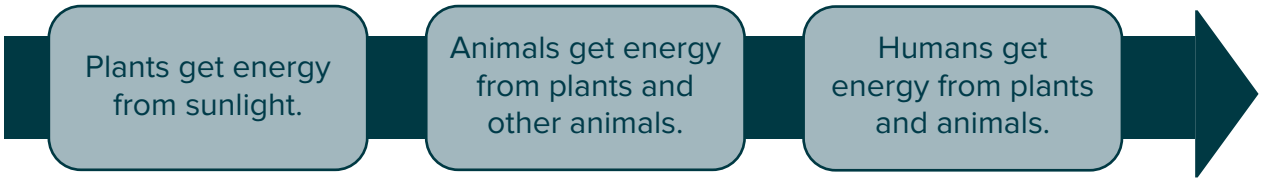
A: Winter: The leaves fall.

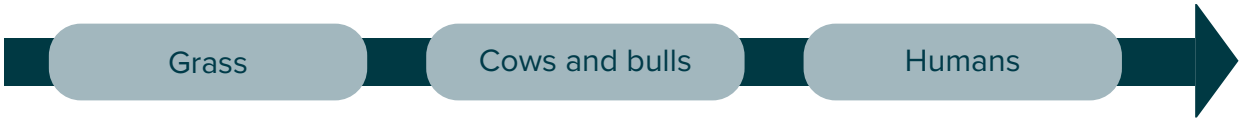
Food chains

All human beings need food to survive. Human beings must either grow, catch or raise their own food. Hence human beings eat plants and animals to survive.

Plants are at the bottom of the food chains because they can feed themselves.









Grown food will be available according to the seasons. Most grown food in the UK will be harvested in the summer and autumn.

Q: Why will most food grow and be harvested in the summer and autumn?

A: Because of the **warmer temperatures** (heat from the sun).

A: Because of the **longer days** in spring and summer (light from the sun).

Q: What is **caught food**?

A: It's all the sea food that we can catch like fish, mussels, crabs, shrimps.

Q: What is **raised food**?

A: It's all the animals that we rear on a farm like pigs, chickens, cows.

Living things that eat plants are called **herbivores**.
Living things that eat animals are called **carnivores.**
Living things that eat plants and animals are called **omnivores.**

Animals

Insects are very small animals. Insects help in the food production for humans and animals.

Food is an essential element for all life on Earth, just like the **air** we breathe and the **water** we drink. All humans, animals and plants need energy to thrive. Energy comes from food.

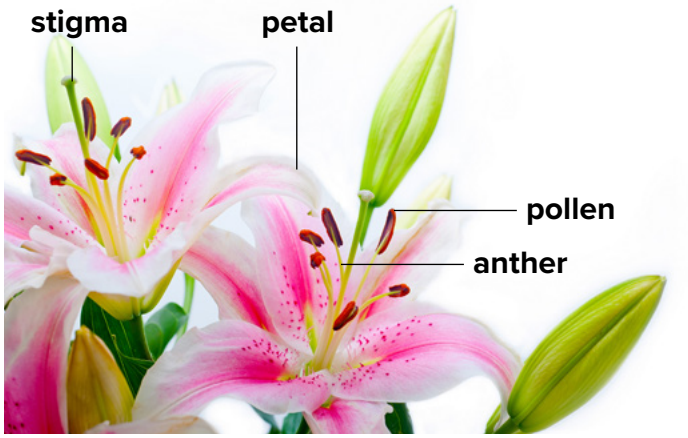
Q: How do insects help us grow food?

A: Insects like **bees** and **butterflies pollinate** the plants in this garden.

Q: What type of plants do insects pollinate?

A: Flowering plants.

Pollination is the reproduction process of flowering plants.



- Insects are attracted to flowers' bright **petals** and fragrance.
- Insects collect **nectar** (a sweet liquid that insects eat).
- Insects rub against the **anthers** (male part of a flower), which rub **pollen** onto themselves.
- Insects visit other flowers and collect nectar and deposit pollen onto the **stigma** (female part of a flower).

Summary

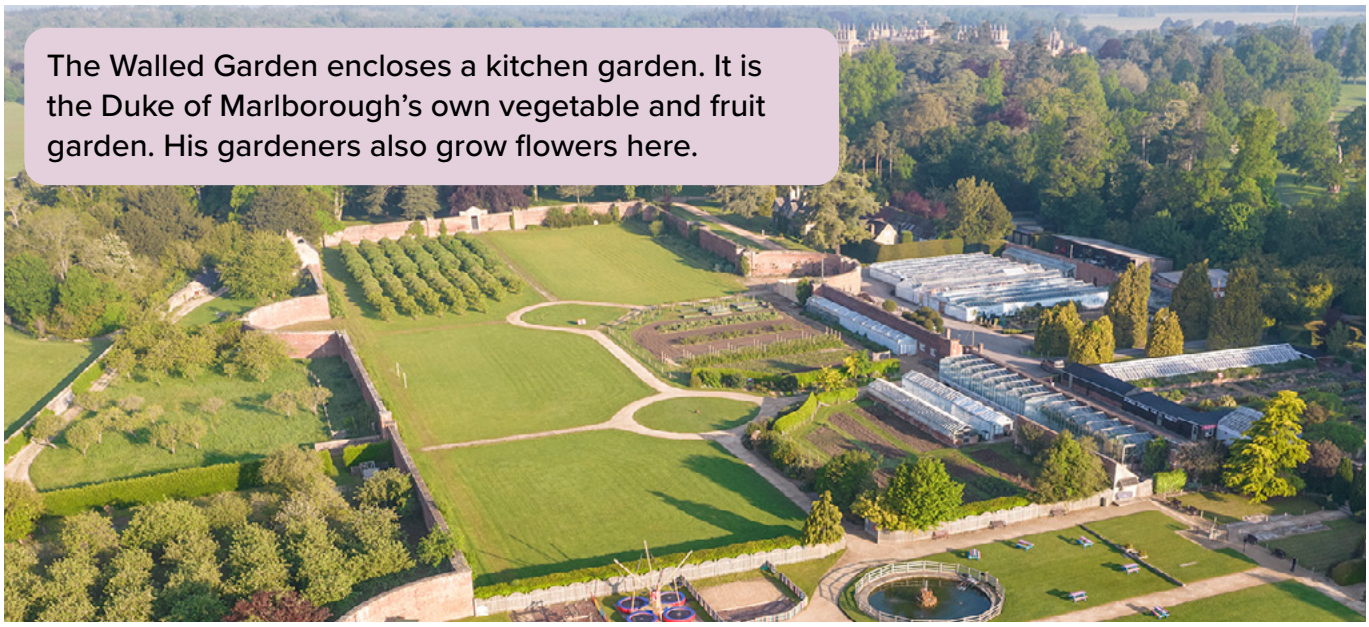
All living things (humans, animals, and plants) need each other to perpetuate life on Earth. All living things are part of the food chains. To ensure there is food for everyone, all living things must be able to breathe clean air and drink clean water.

At Blenheim, we are in the process of planting trees and growing wildflowers. We are **rewilding**.



- **Oak trees** help us clean the **air** we breathe. The air is very polluted, and it causes **climate change** and **global warming**, which is not good for living creatures on Earth. Oak trees absorb carbon dioxide (sequestration) and keep it away from us for a very long time.
- We are re-developing areas of the Walled Garden with **native wildflowers** to feed **honeybees** that have chosen to live there. This will give them a chance to thrive and in turn they will pollinate the flowering plants in the Walled Garden.
- We are re-establishing conditions that will support natural **ecosystems** and encourage **biodiversity**.

Materials



The Walled Garden encloses a kitchen garden. It is the Duke of Marlborough's own vegetable and fruit garden. His gardeners also grow flowers here.

There are fruit trees growing along the **brick walls**.

Q: Do you know why they are growing so close to the walls?

A: Because the bricks absorb heat from the sun and release the heat slowly.

A: Many fruit trees grow better when it's warmer.

Q: How do the brick walls help trees grow better?

A: Bricks are a type of stone. **Stone** is a piece of rock.

A: Rock is made of minerals. Minerals are compacted through thousands of years to create rocks.

A: Rocks, stones, and bricks are known to naturally absorb, keep and release heat very slowly.

There are flowers in the **glasshouses**.

Q: Do you know why they are growing in glasshouses?

A: Because glass lets the sun heat through and keeps it inside.

A: Many flowers grow better when it's warmer.

Q: How the glasshouses help flowers grow better?

A: **Glass** is made of sand.

A: Glass lets the sun heat through and will keep the heat until there is no more sunlight.

A garden must be well watered to help all the fruits, vegetables and flowers grow well. Today, gardeners turn the tap on and water the garden with very long hosepipes. This garden was built over 300 years ago.

Q: Where did the gardeners get the water from?

A: They collected rainwater in very large pools.

A: The gardeners collected water from the pools with their watering cans.

Q: Most watering cans were made of **metal**. Why?

A: Because if they were made of wood, they would rot away with all the water.

A: Because if they were made of rocks, they would be too heavy to carry.

A: Because if they were made of glass, they would break too easily.

A: Because plastic was not yet invented.

Fungi, lichens and mosses

Trees with fungi, lichens and mosses attract birds and bugs.

Fungi on trees are best observed in July, August, September.

- A fungus is a **living thing** that is **neither a plant nor an anima**l. A common term to designate a fungus is “mushroom”. It is no longer considered a plant simply because a fungus has not got a stem, roots, or leaves.
- Some fungi live on or inside plants and animals. Most fungi feed on dead plant and animal remains; they are called **saprophytes**; they help **break down the dead plants and animals into nutrients for the soil** (nitrogen and phosphorous) and resend carbon dioxide into the atmosphere. When fungi feed on living plants and animals, they are called **parasites**.
- Fungi are very useful in the environment. Not only do they help provide **food** (yeast for bread, cheese) and medicine (antibiotics and penicillin), they are the foundation of trees’ **communication** system.
- Trees communicate with each other through their **roots**. There is a fungal network (mycorrhizal network) in the soil that connects the trees together. This is how **Mother Trees** communicate with their family.

Lichens on trees are a good indicator of the air quality.

- Lichen is a mixture of an alga and a fungus. The fungus becomes the host, and the alga feeds the fungus.
- Lichens can be found on living things (trees) and non-living things (stone).
- Lichens are a keystone species in many ecosystems. They are food for animals (deer, birds, rodents); they are habitats for smaller animals (insects), and they are nesting materials for birds.
- Just like oak trees, lichens absorb carbon dioxide (sequestration) through photosynthesis and clean the air for all living things. Due to its dense texture, lichens attract dust and recycle it into the soil (nitrogen).

Mosses on trees are also a good indicator of the air quality.

- Moss is a non-flowering plant, so it doesn’t produce seeds. Just like a fungus, it hasn’t got roots.
- Mosses are found in moist habitats like woodlands and forests but can be found anywhere where water gathers.
- Mosses have the ability of adapting to environmental changes hence can be found in cold and hot climates.
- Mosses have the key ability of retaining water and stabilising the soil surface, which helps new plants to grow. Just like lichens, mosses attract dust and recycle it into the soil.

Birds are part of food chains and ecosystems.

- While bees and butterflies help with pollination, birds help with **seed dispersal**. Once a flowering plant has been pollinated, it will die and make seeds. Birds will eat the seeds. Birds will disperse the seeds through their droppings. The droppings will be broken down into the soil and recycle the organic matter into soil nutrients.
- Seed dispersal is a process that brings plants back to the ecosystems.

Bugs are just as important as birds.

- Insects create the foundation for ALL land ecosystems. Without insects our terrestrial ecosystems would collapse.
- Not only do they **pollinate** plants, but they also **recycle nutrients** and **fertilise the soil**.

If you have any questions or comments about this self-led resource, please contact our Education Team at **education@blenheimpalace.com**

"Look after the land and the land will look after you. Destroy the land and it will destroy you."

Aboriginal proverb

Points of interest:

