

Plants

National curriculum Objectives:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Science in the news today

Plants have varied life cycles. Some plants, for example, only live for one year but a lot of trees live for much much longer.

The tree photographed on the next slide is called a ginkgo tree, and is over **1,400 years old**. It was planted in China by an old emperor and has survived all these years - a really incredible feat. But how?

Recently scientists have found out that, unlike in humans and animals, the older ginkgo trees produce seeds, and fight off disease, at the same rate as the fresh, young trees. In some ways this means that the ginkgo tree that is over 1,000 years old is just as sprightly as a new, young tree!

This isn't the same for all types of trees. Some only live to be 100 years old, some only produce seeds at certain points in their life and some, like the ancient ginkgo, live for thousands of years. When you're next looking at a big old tree, think about how long it may have been around, and what it may have lived through, because it is probably older than you think!

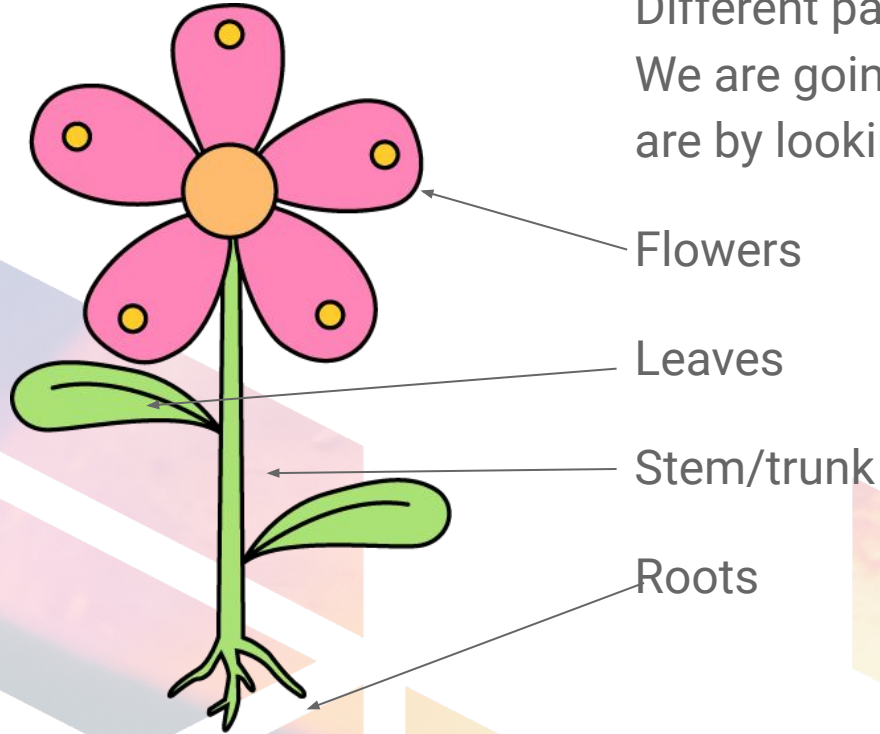
Here is a picture of the ginkgo tree

A ginkgo tree in Xi'an, China, that an emperor planted some 1,400 years ago.

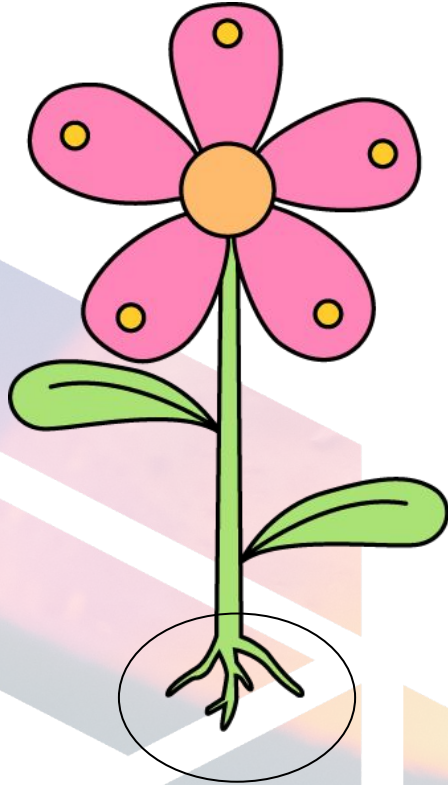


What makes up a flowering plant?

Different parts of a plant have different functions. We are going to explore what all those functions are by looking at the:



What makes up a flowering plant?

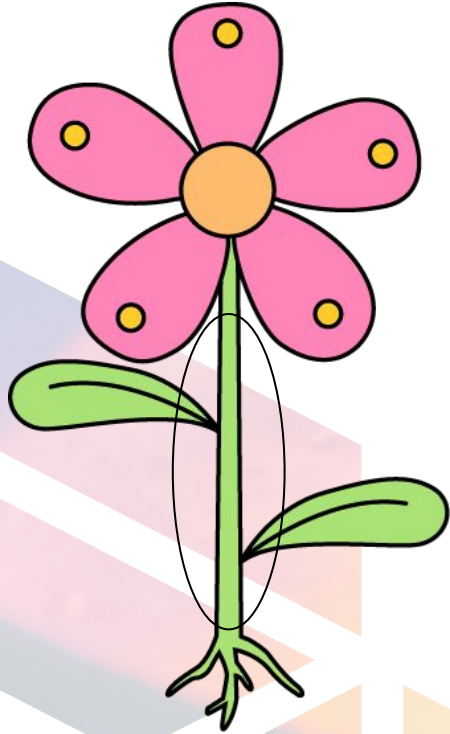


Roots:

All plants have roots. The roots are the part of the plant underground, in the soil. They absorb nutrients and water that the plant needs to survive.



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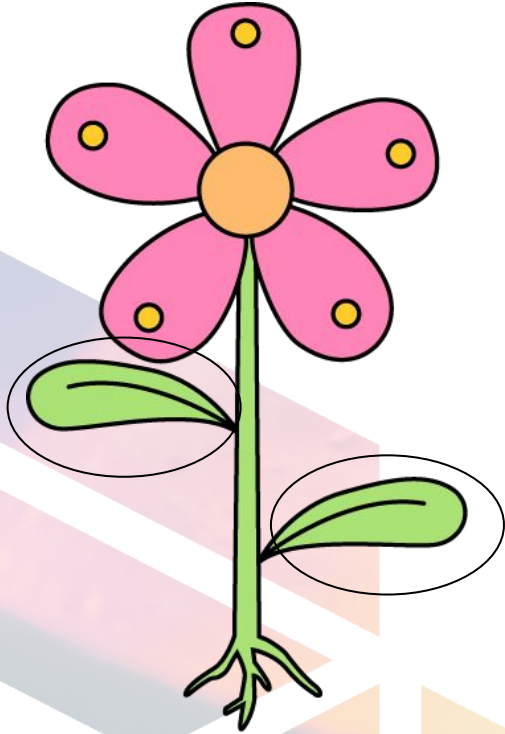


Stem/Trunk:

The stem or trunk of the plant transports the water and nutrients around the plant to where it's needed. It also helps keep the plant upright.



What makes up a flowering plant?

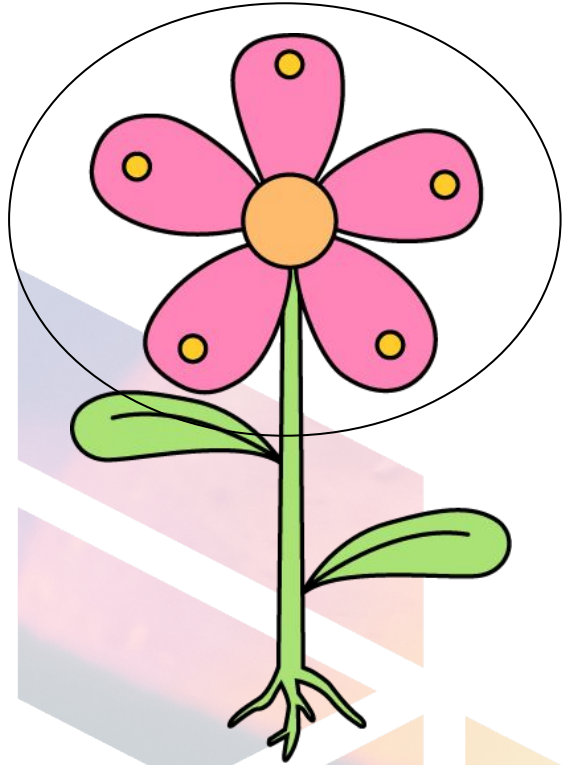


Leaves:

The leaves of a plant absorb sunlight and use it to make food and nutrients for the plant. This process is very important and is called **photosynthesis**.



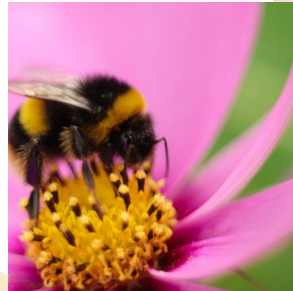
What makes up a flowering plant?



Flowers:

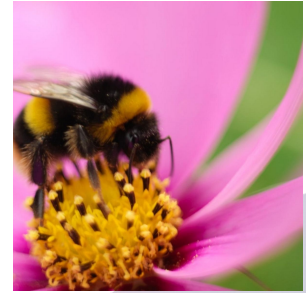
Not all plants have flowers but the ones that do, use them as an important part of their life cycle.

Flowers are usually brightly coloured to attract bees, which help pollinate the plant and spread seeds.



So, what do plants need to survive?

Now that we know what makes up a plant, let's think about what a plant needs to survive. Based on the last few slides, can you guess any of the things a plant needs?



Plants need water.



Water from the soil, is taken up by the plants roots.

Plants need nutrients.



Nutrients cannot be seen by the human eye but they are in the soil. Nutrients are taken up by the plants roots.

Plants need air.



Plants need to breathe. They need oxygen to convert food into energy.

Plants need light.



Plants turn light into food, using photosynthesis in their leaves.

Plants need room to grow.



Without enough room, plants can become small or even die. Overcrowded plants are also more likely to suffer from diseases.

What exactly is pollination?

When bees land on a flower they are there to collect the nectar inside the plant.

While they are doing this the pollen from the plant is rubbed off onto the bee. The bee then travels to another plant, where the pollen from the previous plant is deposited.

The pollen is then deposited onto the reproductive part of the new plant. We then say it has been 'fertilised'.

This new plant then grows new seeds which go on to grow into more flowers - and the cycle happens again!



Grow something!

What do you need?

- **A glass jar or clear plastic pot**
- **Cotton wool or a paper towel/tissue**
- **Dry beans or seeds- broad beans, green beans, coriander seeds or mustard seeds**
- **Soil (optional)**

Instructions:

1. First, fill the bottom of the jar with cotton wool.
2. Next, gently place your bean in the jar in the cotton wool.
Top tip - place your beans at the side of the jar so you can watch it grow.
1. After that, water the cotton wool until it is damp, but not soaking wet.
2. Then, place your jar in a window with lots of sun.
3. Finally, keep an eye on your bean. It should start sprouting in the first couple of days, but it may take a little longer.

If you want, you can keep a journal of what's happening to your bean as the days go by. How quickly is it growing? Does it have roots, a stem, leaves? You could try two jars and place them in different windows, which one grows quicker?

1. When a complex network of roots have formed in the jar and the new bean plant has got a few leaves, you can carefully take it out and plant it in some soil.
2. Keep watering it and giving it lots of sun. Watch it grow!

We would love to see what you're growing, so please take a photo and send it to outreach@sciencecreates.co.uk.



The pollination example

What do you need?

- A packet of crisps, ideally wotsits
- 2 pieces of white paper
- Pens or pipe cleaners or face paints (optional)



Instructions:

1. First, draw a large flower on each of the 2 pieces of paper. You can cut these out but don't colour them in.
2. Next, decorate a few of your fingers to look like bees. You can do this by drawing on them, using facepaint on them, or by wrapping pipe cleaners around them. You can skip this step if you don't want to, or can't do this.
3. Then, place a few crisps in the centre of one of the flowers. These crisps represent the pollen in the flower.
4. Next, with your new bee fingers, 'fly' to the flower with the crisps in the centre and begin to eat them. Don't clean or lick your fingers though.
5. Finally, when you have finished eating, fly to the other flower and 'land' on it with your fingers. 'Walk' your fingers around the flower so a few seconds and see what happens. All the 'pollen' (crisp crumbs) have travelled from one flower to another. This new flower has now been pollinated. Once pollination occurs, the fertilised flower produces seeds, which enable it to reproduce.

Do some weeding!

What do you need?

- A garden or path with a weed or unwanted/overcrowded plant growing
- A trowel or spoon (optional)

Instructions:

1. First, ask an adult to find a weed or unwanted/overcrowded plant growing in your garden or path
1. Next, using a trowel, spoon or just your fingers, very gently dig around the bottom of the plant. You are trying to pull the whole plant out of the ground without damaging the roots.
1. Then, challenge yourself to name all the parts of the plant and their functions.
2. Finally, whilst observing your plant very carefully, try drawing and then labelling it.

