

Plant Detectives

Activities for children aged 7–11 years

WWT has a well-established and well-loved education programme that we run across the UK at our ten wetland sites. We've designed these short activities based on one of our school activities. We've made it to connect you and your family to the natural world and help you to work with your children to feel great about nature and understand some of the things that WWT love and care about.

Why wetlands?

WWT works across the UK to save, conserve and build wetlands for wildlife and people. Wetlands are one of the most important habitats on earth – storing huge amounts of CO₂, providing a natural way of stopping flooding and serving as a home for huge numbers of different creatures.

This activity will help you and your children to explore how wetland plants grow and why they are so important to life on earth.

These activities link to the National Curricula for science in England, Northern Ireland, Scotland and Wales.

Stuff you need:

- Plants Visual
- Plant ID sheet (see final pages of this document)
- Celery with leaves still attached or white carnation flower on stem (optional)
- Food colouring – Red or dark blue work best (optional)
- Vase, jar or glass
- 4 small plants of the same type and approximately the same size and condition (in their pots)
- 2L plastic bottle
- Sellotape
- Cardboard box

Note: Where you see a  this indicates a question to ask your child

Indoor activities

(90 minutes – Can be broken into three manageable sections)

Section 1: Plant parts

- Look at the Plants Visual. This shows two plants; a water lily and a dandelion.
- Get your child to cut out the labels and use them to label the following parts of each plant: **Roots; stem; leaves; flowers**. If they place them in the middle, between the two pictures, they can draw lines from each label to the correct part of both plants. Help your child with any they are unsure of.
- Now see if they can match the correct description to the each part of the plant.
- They can then stick these in place if they haven't already done so.

Answers

Roots:

- Anchor the plant to the ground so it doesn't blow away. Also soak up water and nutrients from the soil.

Stem / trunk:

- Carries water and nutrients from the roots of the rest of the plant.

Leaves:

- Produce food for the plant.

Leaves take in water, light and carbon dioxide and use them to make food for the plant as well as oxygen which is released into the air. This means that plants are great for the environment because they take in carbon dioxide, a gas that causes climate change, and give out oxygen, which all animals need to breathe.

Flower:

- Makes seeds to produce new plants. (This is explored in more detail below).

Optional additional activity:

- Fill a vase or other container with water and food colouring (add several drops of food colouring - the more you can spare the better - red or dark blue work best).
- Cut a couple of centimetres off the bottom of the stalk of a stick of celery (with the leaves still on) or stem of a white carnation.
- Place the celery or carnation into the container with the coloured water.
- Keep observing over the next couple of days. You should see the celery leaves or carnation flower start to turn the same colour as the food colouring. This is because the colouring has been transported up through the roots and stem to the leaves / flower. If you have used celery, you might even be able to see the colouring in the 'veins' at the top of the celery.

Section 2: What do plants need to stay healthy?

Q What do you think plants need to grow and stay healthy?

- Make a list of all the answers your child comes up with. Add and discuss any of the following that they haven't come up with: **Water, air, light**.
- We are now going to carry out an experiment to test whether plants need water, air and light to survive.

We are going to test how well each of the following plants grow / survive:

Plant 1:

Will have light, water and air.

Plant 2:

Will receive no water.

Plant 3:

Will receive no light.

Plant 4:

Will receive no (additional) air.

Prepare and look after each plant as follows:

All plants:

- It is best if each plant is in its own plastic pot and has a saucer underneath to collect any water (not required for plant 4). Place them in a location such as a windowsill where they will get plenty of light.

Plant 1:

- Water each day.

Plant 2:

- Don't water at all.

Plant 3:

- Place a cardboard box over it and seal up any gaps where light might get in.
- Remove the box to water the plant each day.

Plant 4:

- Cut the top off a 2L plastic bottle. Put the plant in and add enough water to last it a week or so.
- Re-seal the top of the bottle using sellotape and ensure that the lid is firmly screwed on.

- Keep an eye on your plants over the next week or so. You should see plant 1 surviving well but the other plants wilting and eventually dying. Discuss with your child why this is.

NOTE: With the plant that didn't have any additional air it is actually a lack of carbon dioxide that meant it couldn't survive. Plants take in light, water and carbon dioxide and use this to produce food (also giving out oxygen as a waste product from this process).

- Look back at the list you created. Are there any other things that plants need to survive?

Plants also need:

Warmth:

- Below a certain temperature, most plants are unable to survive.

Nutrients:

- Most (but not all) plants obtain their nutrients from the soil.

NOTE: Seeds do not need light to germinate because seeds have their own store of food. It is only once the plant's leaves are fully developed that it needs light.

Section 3: How do plants reproduce?

- Just like all other living things, plants don't live forever. They need to make new plants. This is called reproduction.

Key word: **REPRODUCTION**

When animals and plants create new animals or plants.

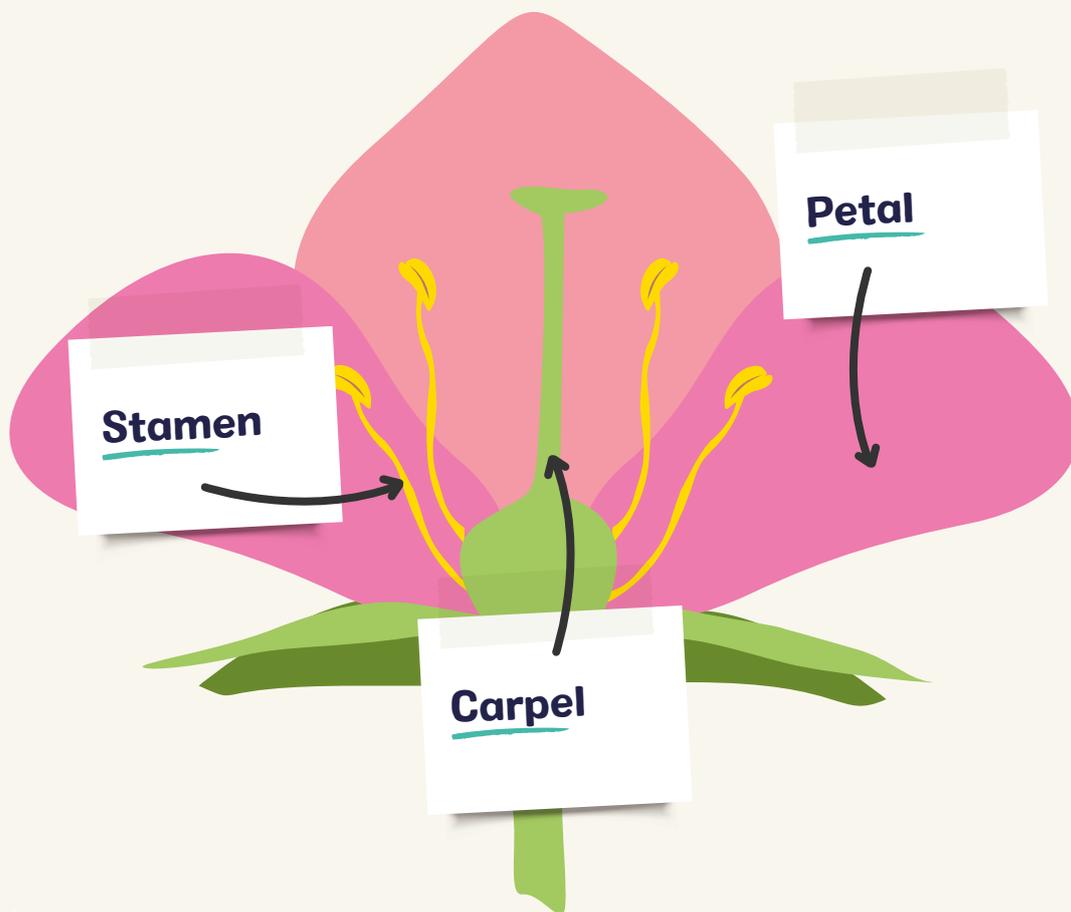
Parts of a flower

- It is the flowers and the parts inside them that make seeds which then grow into new plants.
- Take the Flower Parts Visual and cut out the labels.

Q Why do you think flowers have petals?

- Petals are used to attract insects to the flower. Insects want to find flowers so that they can feed on the nectar they contain.
- Add the petal label.
- Inside the flower there are male and female parts.
- The male part is called a stamen. It contains pollen. There are usually several of these and they are made up of a thin 'filament' holding up an anther containing the pollen.
- Add the stamen label.
- The female part is called a carpel. It contains the eggs. The carpel has an ovary containing the eggs at the bottom and a sticky 'stigma' at the top to catch the pollen (held up by a 'style').
- Add the carpel label.

Correct answers



Pollination

- When pollen is transferred from the stamen to the carpel it fertilises the eggs and makes seeds.

Q How do you think the pollen could be transferred from the stamen to the carpel?

There are two ways the pollen can be transferred:

- 1 By insects. Insects dig around for the tasty nectar and get covered in pollen. Some of this pollen falls off into the carpel of either this or another flower.
- 2 By wind.

Seed dispersal

- Of course, the seeds now need to find their way to the soil. The seeds need to be carried away from the parent plant because otherwise they won't have enough water and nutrients between them. This is called dispersal.

Q How do you think seeds might be dispersed?

There are four main ways that seeds can be dispersed:

By animals

Some plants have their seeds inside fruits and berries. Animals eat these and then poo them out somewhere else. Other plants have seeds that stick to animals and then fall off somewhere else.

Q Can you think of any plants whose seeds might be dispersed by animals?

- Seeds that are eaten by animals include the seeds inside all fruits including berries such as hawthorn, ivy, holly, roses (rose hips) and rowan trees.
- Examples of plants whose seeds stick to animal fur include burdock and goose grass (often called 'sticky weed' or 'sticky wicky').

By wind

Q Can you think of any plants whose seeds might be carried by the wind?

- Examples of plants whose seeds are carried by the wind include dandelions and bulrush as well as ash and sycamore trees (whose seeds are often called 'helicopters').

By water

- Many seeds float and are carried by water.

Q Can you think of any plants whose seeds might be carried by water?

- Coconuts and the seeds of foxgloves, harebells, willow and birch trees all float and can be carried by water.

By explosion

- Possibly the most impressive are plants whose seeds are dispersed by explosion! They usually have a pod that dries up and splits open, shooting out the seeds.

Q Can you think of any plants whose seeds are dispersed by explosion?

- Examples include peas and laburnum

- When these seeds enter the soil and begin to grow, this is called germination.

Key word: GERMINATION

When seeds start to grow.

Section 4: The importance of plants

Q Why do you think plants are important?

Get your child to list as many reasons as they can and then add any from the list below that they might have missed:

- Plants provide food for a wide range of animals. Without them there would be no life on earth!
- Plants provide shelter for a wide range of animals. Many animals live in and on trees and other plants. Many animals nest in them.
- By absorbing water and providing root ways into the soil, plants can help reduce flooding.
- By absorbing carbon dioxide, plants help to combat climate change (see 'climate champions' session).

Section 5: How are plants adapted to life in wetlands?

- Many of the plants that live in wetlands have specific adaptations that enable them to live in these habitats.
- Look back at the water lily illustration on the Plants Visual.

Q How do you think the water lily is adapted to life in a pond?

Water lilies have evolved a number of adaptations to enable them to live successfully in ponds:

- They can take in water from the underside of their leaves as well as their roots.
- They have leaves with a large surface area to enable them to float. Because they can float, they can rise and fall with the water level. It also means water lilies can live away from the edges of the pond where they might be overshadowed by taller plants.
- Their flowers are bowl-shaped to enable them to float.
- The seeds are designed to float for a short period of time and then sink. This enables them to float away from the plant and then sink down into the soil and sediment at the bottom of a pond.
- They have much weaker stems because the stems don't need to support the weight of the plant.

Your child might want to add some of this information to their Plants Visual (but it's more important to discuss it).

Take it outside:

(15 minutes)

Plant hunt

- Carry out a plant hunt. See how many of the common plants on our Plant ID Sheet you can find.

Q Which is your favourite plant? Why?

- Without plants animals wouldn't survive and there would be no life on earth.

Q How does this make you feel about plants? Aren't they amazing?

Plant parts

- Find a weed that can be uprooted. Uproot it and lie it on the ground. Get your child to point to each of the parts (**roots; stem; leaves; flowers**) and tell you what each does.

Bee search

- Keep an eye out for bees and see if you can observe them pollinating flowers. Can you see any of the pollen stuck to their bodies? Approach the bees carefully so as not to get stung.

Q How did watching the bee(s) make you feel? Why?

Without bees and another pollinating insects, many plants would not be able to survive. Aren't bees amazing?



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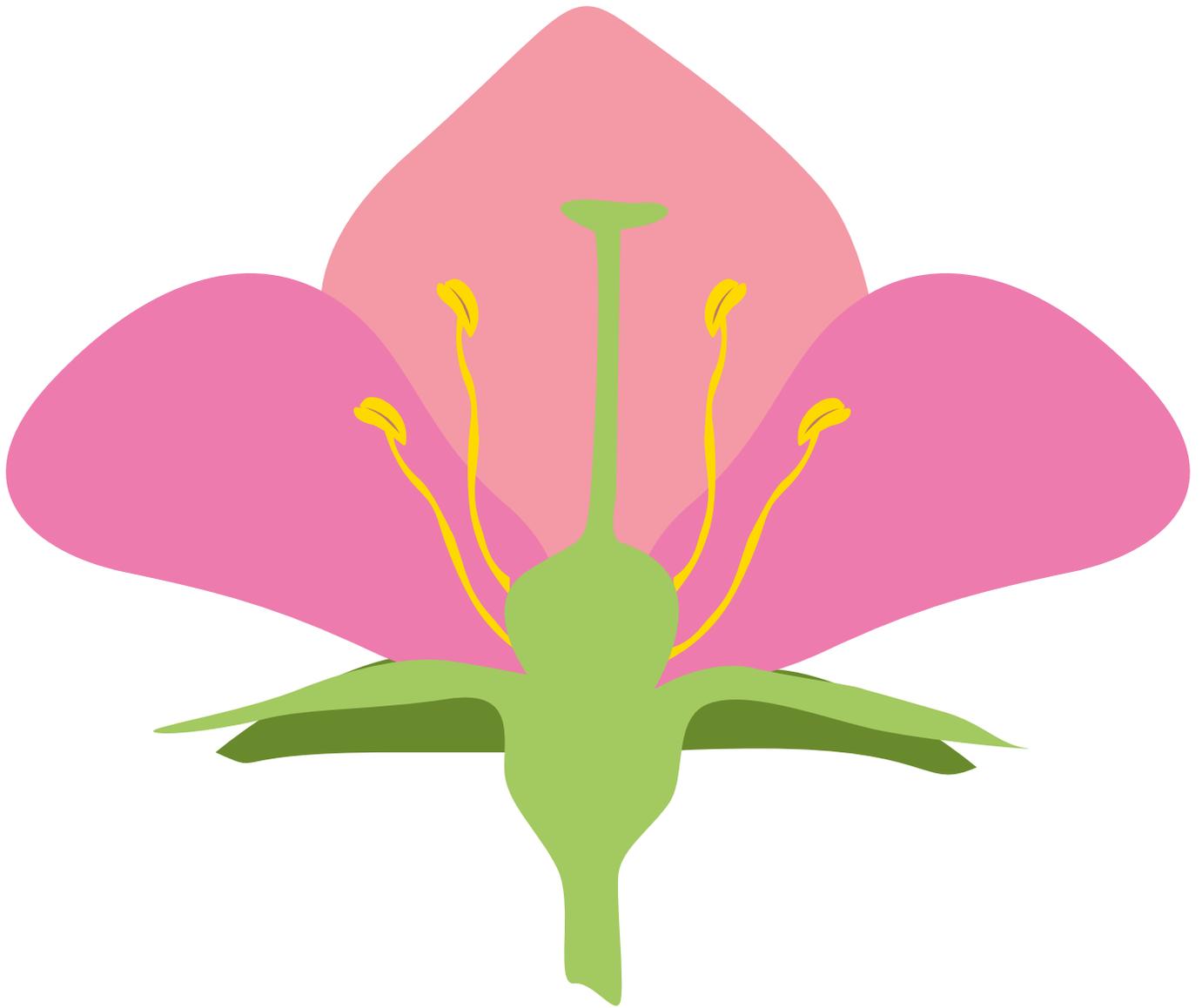


Have fun and do share your work to our social media accounts –
we'd absolutely love to see it!

Plants visual



Parts of a flower



Plants visual cut outs

<u>Stem</u>	<u>Roots</u>	Anchor the plant to the ground and soaks up water and nutrients from the soil.	Makes seeds to produce new plants.
<u>Flowers</u>	<u>Leaves</u>	Carries water and nutrients from the roots of the rest of the plant.	Produce food for the plant.

Parts of a flower visual cut outs

<u>Stamen</u> (male part): Contains pollen	<u>Carpel</u> (female part): Contains eggs	<u>Petal</u> Attracts insects
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Plant ID sheet

