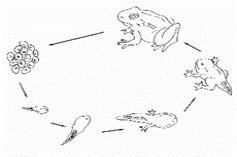
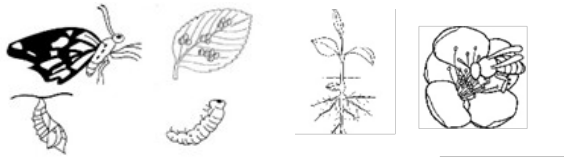
In this unit we will



Life Cycles



1. Review and revise the stages in plant life cycles
2. Compare & contrast insect and amphibian life cycles
3. Study the life cycle of birds
4. Look at mammal life cycles and how they can differ from one another
5. Study the different stages of the human life cycle
6. Learn about the changes that occur in human development, including puberty

Science Skills that we will develop:

Explaining Science

1. I use complex science words correctly
2. I use a science model to describe and explain
3. I draw & annotate diagrams to help describe/explain

Data, tables & Graphs

I use a frame to construct a graph and begin to scale axes

Revise, label & look at the functions of the parts of a flower

Look at the process of pollination

Learn about fertilisation

Find out about seed production and dispersal

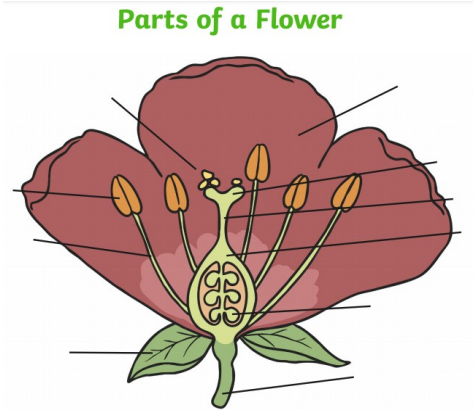
Draw, label and annotate a plant life cycle

Why do plants have flowers?

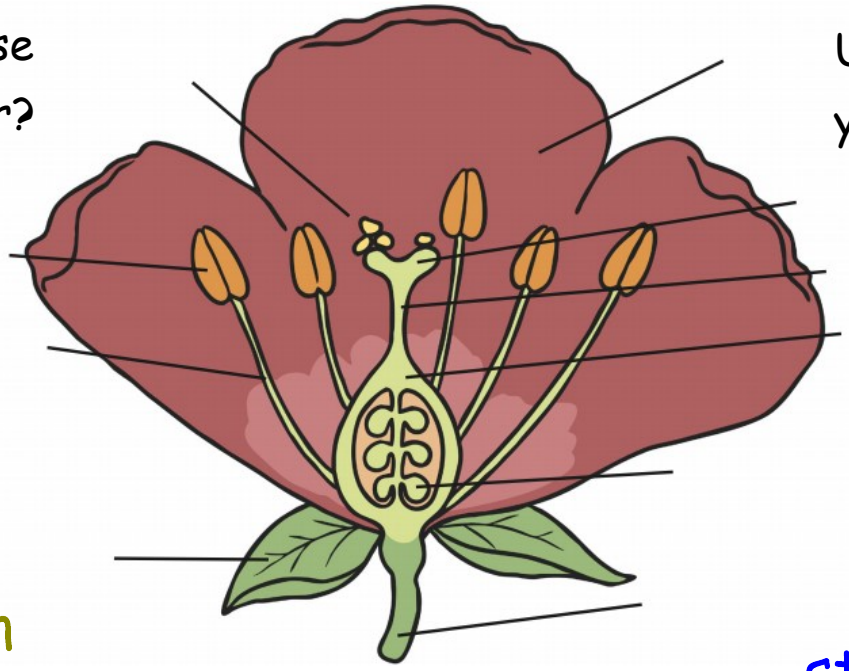
From your work in Year 3 or 4, you should have remembered that flowers are the reproductive parts of some plants. They contain both male and female parts, and are designed to create seeds.

Can you remember the different parts of a flower and their functions?

Work with a partner to **discuss** the missing labels of your 'cut-away' diagram of a flower.



How many of these did you remember?



Use the words to **label** your diagram in pencil.

anther

filament

style

pollen

petal

ovule

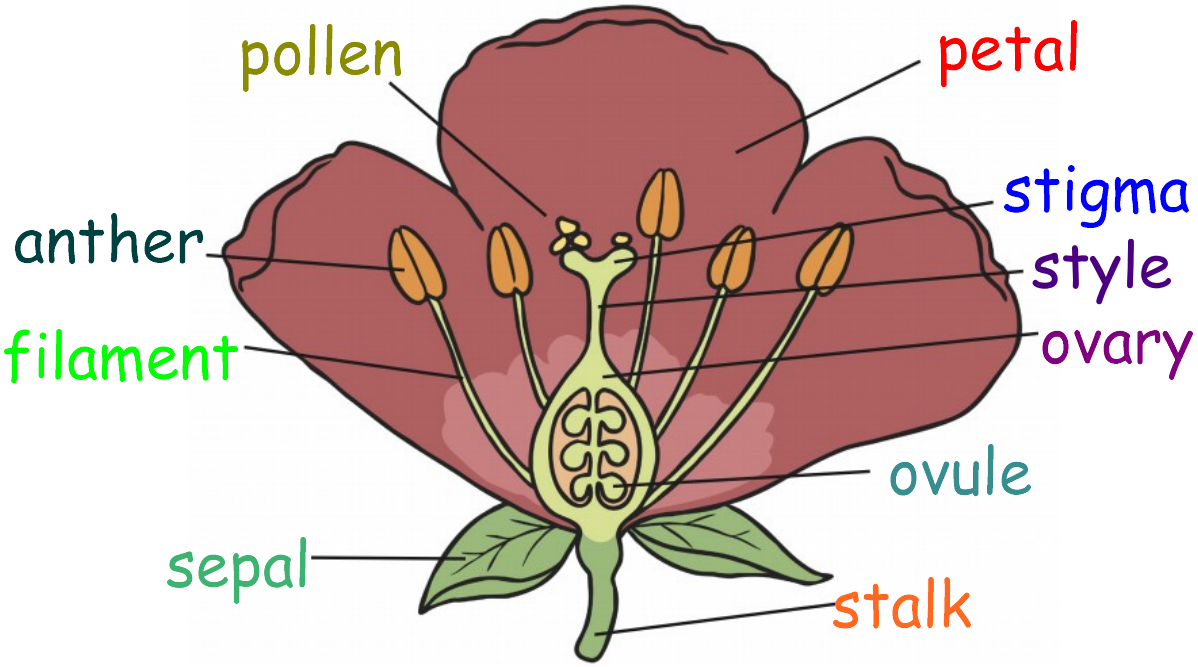
stigma

ovary

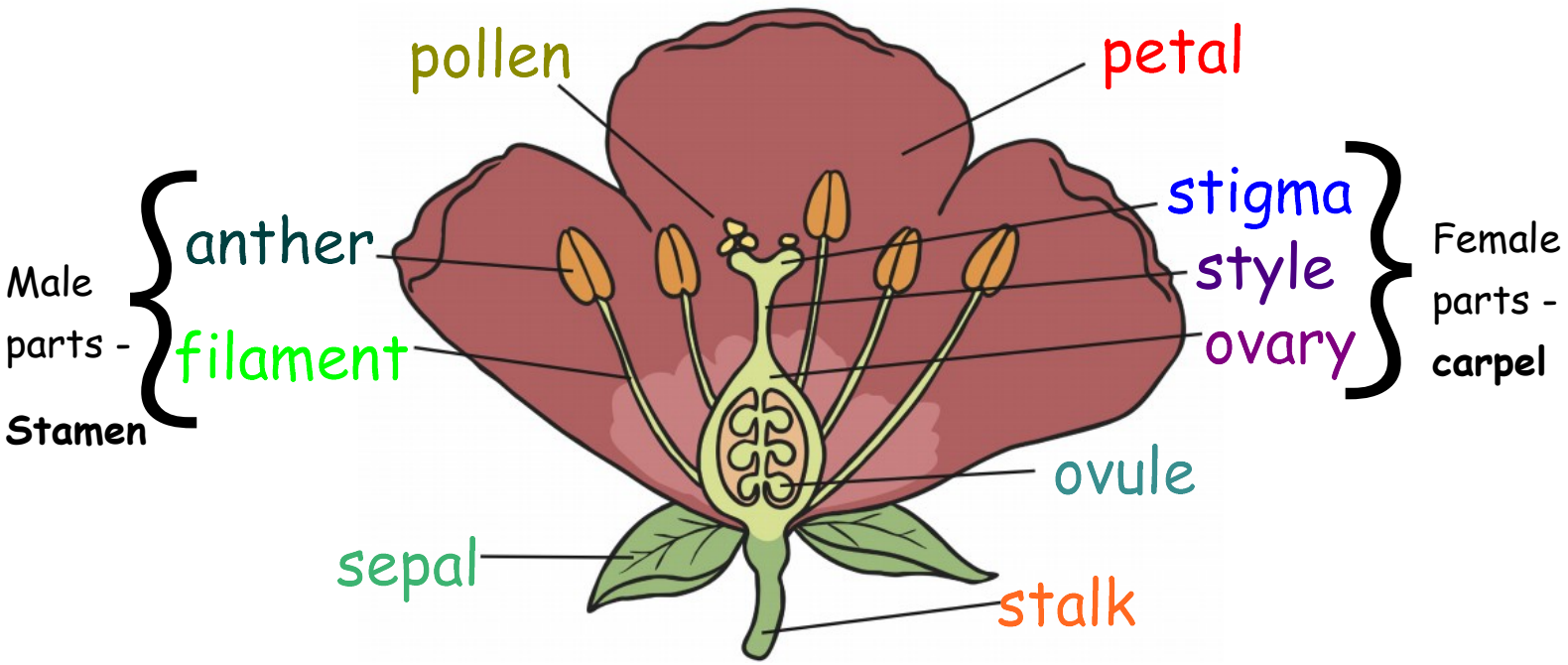
stalk

sepal

Mark and correct your work.



Mark and correct your work.

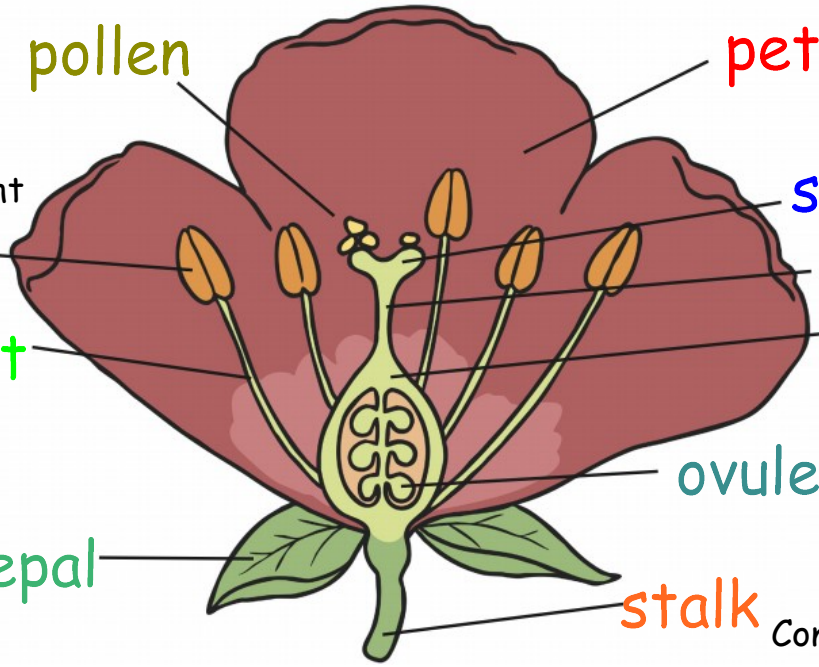


Can you remember what each part of the flower does?

Connects stigma to ovary	Contains the ovules
Holds the flower upright	Produces pollen
Attracts pollinators (e.g. insects)	Holds up the anther
Contains male cells (transferred from another flower)	Sticky receptacle for pollen
Protects the flower when it is a bud	Contains the female cells - develops into seeds

Cut out your statements and work with a partner to put them next to the correct flower part on your labelled diagram.

Match the functions to the labels.



pollen

Connects stigma to ovary

petal

Protects the flower when it is a bud

stigma

Contains the ovules

anther

holds the flower upright

style

Produces pollen

filament

ovary

Holds up the anther

Attracts pollinators (e.g. insects)

ovule

Sticky receptacle for pollen

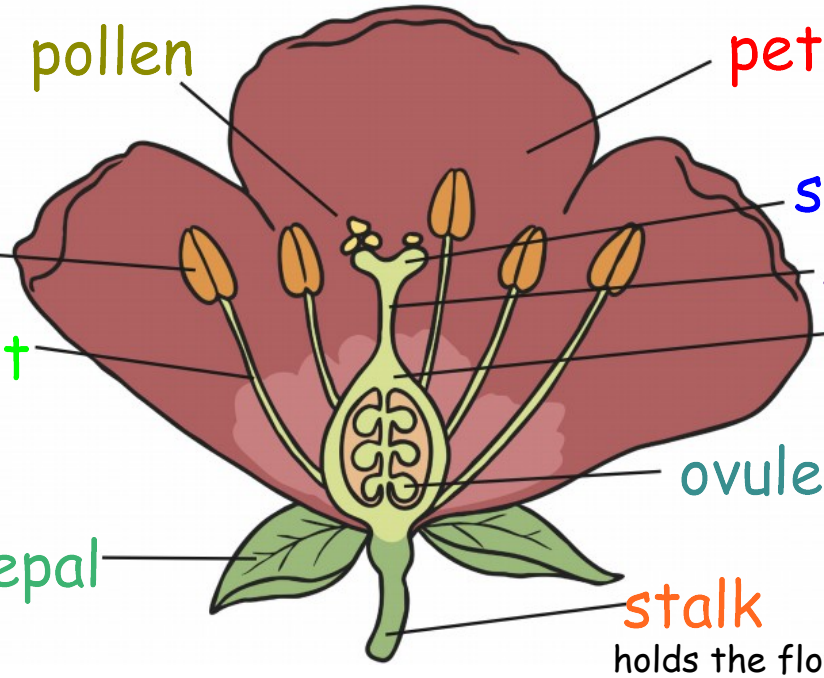
sepal

Contains male cells (transferred from another flower)

stalk

Contains the female cells - develops into seeds

Check and glue your labels down.



pollen

Contains male cells (transferred from another flower)

petal

Attracts pollinators (e.g. insects)

stigma

Sticky receptacle for pollen

style

Connects stigma to ovary

anther

Produces pollen

ovary

Contains the ovules

filament

Holds up the anther

ovule

Contains the female cells - develops into seeds

sepal

Protects the flower when it is a bud

stalk

holds the flower upright

How does pollen from one flower get to another?

pollen on tulip stigma

pollen on geranium stigma

pollen on stigma of grass

1. Pollinating animals

honey bee

humming bird

mouse lemur

Nectaries inside flowers produce nectar, a sweet substance that attracts pollinators, onto which the pollen brushes off. In this way, the pollen from one flower's anthers is transferred to another flower's stigma, as the pollinators visit many different flowers.

2. The wind

pine cone

grass spikelets

hazel catkins

Whilst most plants produce flowers and rely on pollinators, many do not; pollen from structures like cone, spikelets and catkins simply falls into the air and is carried by the wind to other plants of the same species. Pollen from these plants causes hay fever in the Summer months.

Complete these sentences underneath your flower diagram:

Pollen travels from the _____ of one flower to the _____ of another. This happens when certain animals (for example _____, _____ and _____) visit flowers for their sweet_____ ; pollen is brushed onto the animals which is then _____ to other flowers.

Plants which do not have brightly-coloured flowers rely on _____ to carry pollen to other plants.

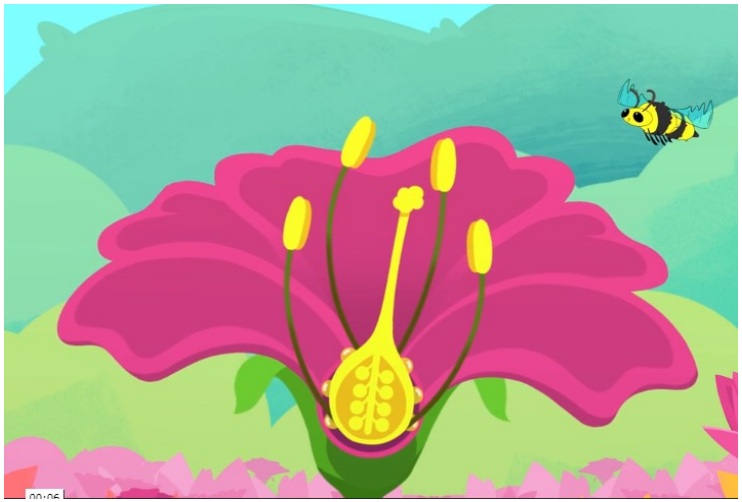
Check and correct:

Pollen travels from the anthers of one flower to the stigma of another. This happens when certain animals (for example insects, humming birds and mouse lemurs) visit flowers for their sweet nectar ; pollen is brushed onto the animals which is then transferred to other flowers.

Plants which do not have brightly-coloured flowers rely on wind to carry pollen to other plants.

Why do plants produce pollen?

Pollen contains the **male cells** involved in reproduction, which need to join with the **female cells** in the ovules in the process of **fertilisation** (sexual reproduction). This enables the flower to produce seeds, so that **new plants** can be created. This video gives a brief summary:



Once the flower has been pollinated, some of the pollen grains on the **stigma** grow a tube all the way down the **style** and into the **ovary,** where they each deliver a male cell into the ovules. Each male cell then fuses with a female cell in the ovule (**fertilisation**), and a **seed** is then produced. At this point, the only part of the flower that is now needed, is the ovary, where the seeds develop, so the rest of the flower dies away. The ovary walls then change to protect the seeds; some become pods, some form shells and others become fruit.

Watch this video of pear fruit forming. Look closely at what happens to the flower ovary as the seeds are forming

How do seeds get dispersed (spread)?

All plants need **light**, **air**, **water** and **nutrients** from the soil to grow well. Ideally, they grow best when there is little competition from other plants, which is why dropping seeds too close to the parent plant is not the best idea.

Seeds need to be spread further away (dispersed) to stand a chance of growing healthily.

peas

poppy seeds

horse chestnut

burdock seeds

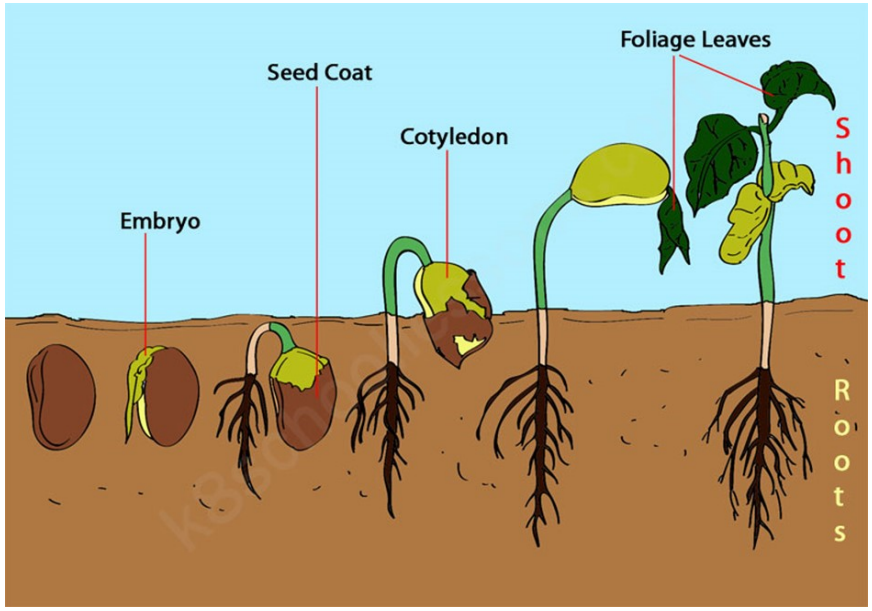
sycamore seed

How are these seeds designed to be dispersed?

dandelion seed

Watch the video - how many different methods of seed dispersal does it show?
Did you think of them all? Are there any methods missing from the video?

What conditions are needed for seed germination?



Germination is the very beginning of new life, when a seed splits and begins to grow. **Nutrients** stored in the seed allow the **embryo** to grow a **root,** which pushes the seed out of the soil and then start to produce a **shoot**. This then grows one or more **primary leaves**, allowing the seedling to begin to **photosynthesise** and make the true, **foliage leaves**

This video is a time-lapse of a bean germinating and growing over 25 days. All of the initial growth, up until the two primary leaves grow, uses nutrients from the seed itself. Note that the primary leaves are a different shape to the true foliage leaves, and also look at how far the root system spreads in comparison with the shoot. Why do you think this is?

Seeds will remain **dormant** (inactive) unless they receive the right conditions for growth.

We (and many other animals) eat seeds because they are full of nutrients. Think about how we keep seeds in our kitchens; what conditions do we keep them in to stop them from germinating?

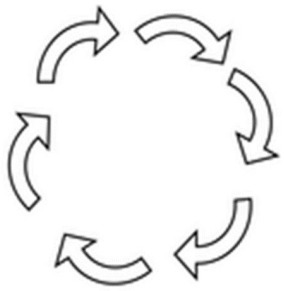
Now think about what conditions the seeds might need to *encourage* them to grow.

All seeds need water, oxygen and the correct temperature to grow. However, there are many variations in this.

Some seeds germinate better in full light (like tomato ) while others require darkness to germinate (such as primula ). Some seed coats are so hard that water and oxygen cannot get through until the coat breaks down. Morning glories  and locust seeds are examples. Other seeds need to be exposed to proper temperatures. Apple seeds will not germinate unless they are held at cold temperatures for a period of time. Blackberry and raspberry seeds will not germinate at all, unless they pass through the digestive system of birds.

The most important factor that triggers germination is moisture.

Science skills Explaining Science	Me	Teacher
I use simple science words correctly to describe stages of the plant life cycle*		
I begin to use some complex science words correctly to describe the functions of some stages of the plant life cycle **		
I use complex science words with confidence to describe and explain the functions of different stages of the plant life cycle***		



Now draw the life cycle of a plant - include some or all of the stage underneath, in the correct order. Draw simple pictures to illustrate each stage and use **correct scientific language** to label and describe each part of the life cycle.

seedling

seed production

germination

adult plant

pollination & fertilisation

seed dispersal