

UNDERSTAND, DESCRIBE AND EXPLAIN: REPRODUCTION IN PLANTS

To understand and describe reproduction in plants

Reproduction	Plants	Sexual reproduction	Male	Female	Stamen	Pistil
Function	Flower	Sepal	Petal	Nectaries	Nectar	Anther
Pollen	Stigma	Carpel	Ovary (ies)	Pollination	Fertilisation	Seed Dispersal
Asexual reproduction		Runners	Tubers	Buds	Shoots	Stem

- Learning links:**
- Geography:
 - Y5: Rainforest/Biomes
Absorbing CO2/
Photosynthesis/
Plant reproduction
- Learning links:**
- Science:
 - Y6: Evolution and inheritance
Genetics/ Offspring/
Reproduction

Revisit, revise and build upon Year 3 learning journey: Plants

Reproduction is vital for all living things. If a species does not reproduce, it *cannot survive* and will *become extinct*. Plants can reproduce in two ways: *Sexually* or *Asexually*.

Sexual reproduction:

Flowers have *male* and *female parts* inside them. Each has a *unique job* to do (*function*). In different species the number, shape and size of each part of a flower may be different.

To *reproduce sexually* (2 plants), *pollen* from one flower must first be *transferred* to *another flower*, either by *insects, animals or the wind*.

The Flower:

Flowers are the *reproductive organs* of the *flowering plant*. The main structures of a *flower* include:

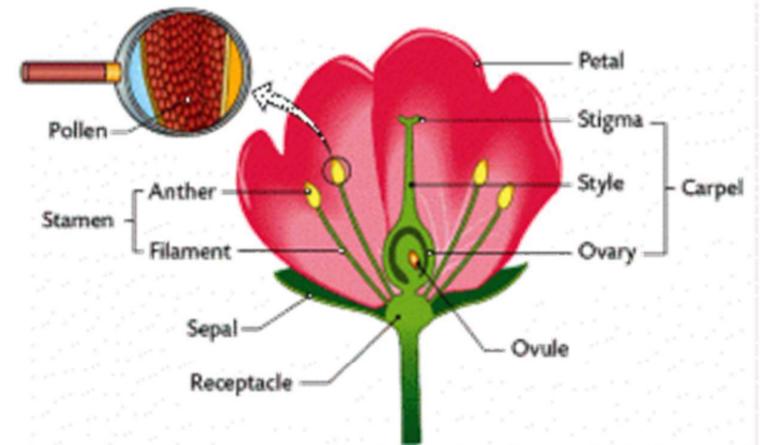
- Sepal** - is a *support structure* for the petal. It is *typically green* and helps to *protect and hold up* the petal.
- Petals** - are *bright and colourful* in order to *attract insects* that help with *pollination*.

Stamen – is the *male part* of the flower that *produces pollen*. There are *2 main parts of the stamen*:

- Filament** - is the *stalk* that *holds the anther*.
- Anther** - is made up of *lobes that attach to the filament*. These lobes *hold sacs* which *contain pollen*.

Carpel - is the *female part* of the flower. It contains the *ovary and the stigma*.

- Stigma** - is the area where *pollen is received*. The stigma may be located at the *end of a stalk* called the *style*.
- Ovary** - is the *ovary* of the flower and *contains ovules*, which are *potential seeds*.



THINKING POINT:



Which are the female and male parts of the flowering plant?

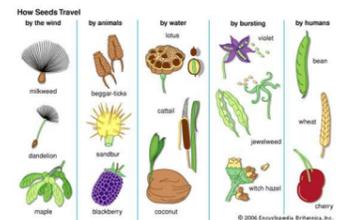
Pollination and Seed Formation:

In order for an *ovary* to *become a seed containing ovules*, it must *receive pollen*. Insects and birds can play an important role in *pollinating plants*. When an insect or bird is *attracted to a flower* by its bright colour, *pollen* sticks on their fur/feathers. As they *move from plant to plant*, they *transfer the pollen* from one plant to another - *pollination*. The *pollen travels down the style to the ovary* and *fertilises* the ovules. When this plant dies, the ovules will be deposited in to the surrounding land/soil to create a new plant.

Seed Dispersal:

Seeds are *dispersed* away from each other and from the *parent plant* so that there is *less competition*. The *most common methods of seed dispersal* are:

- Wind:** *Sycamore fruits* are *light* and have *extensions* which *act as parachutes* or *wings* to *catch the wind*.
- Animal internal:** Tomato, plum, raspberry and grape plants have *brightly coloured* and *succulent fruits* which *contain seeds* with *indigestible coats* which allow the *seeds* to *pass through* the *animal* undamaged.
- Animal external:** Goose grass and burdock fruits have *hooks* which *attach themselves* to the *fur of passing animals*.
- Explosive/Self-propelled:** Pea pods *burst open* when ripe *projecting the seeds* away from the plant.



THINKING POINT:



Why is it important for seeds to disperse away from their parent plant?

Germination:

When *seeds* are *planted*, they first *grow roots*. Once these roots take hold, a *small plant* will *begin to emerge* and eventually break through the soil. When this happens, we say that the *seed* has *sprouted*. The scientific name for this process is *germination*.

After the *seed* has made it to a new location and is covered with dirt, it can begin *germination*. *Germination* is the process of *seeds developing into new plants*. First, the *right conditions* must trigger the seed to *grow*. Usually, this is decided by how *deep* the seed is planted, *water availability*, and *temperature*. When water is plentiful, the *seed fills with water*. The water *activates proteins* that *begin* the process of *seed growth*. First the seed *grows a root* to *access water* underground. Next, the *shoots*, or growth *above ground*, begin to *appear*. The seed sends a shoot *towards the surface*, where it will *grow leaves* to harvest *energy from the sun*. The *leaves* continue to *grow* towards the *light source*.



Asexual reproduction:

Whilst some plants create **offspring** using **sexual reproduction**, others do so using **asexual reproduction**. The main **difference** is that whilst **sexual** reproduction needs **2 parent** plants; **asexual reproduction** needs only **one parent**.

It is **possible** for **plants** to naturally **produce offspring** from **one parent, without flowers or fertilisation**. There are a number of ways plants can do this, but **3 important methods** are:

1. **Runners** - a slender, **fast-growing stem** that **grows sideways** (horizontally) over the **soil surface** and **pushes down roots** to **form new plants** Example: Spider plant and strawberry plant. The **new plants** are called **plantlets**.
2. **Tubers** - many plants **naturally develop underground food storage organs** that later **develop** into the **following year's plants**. The **tuber** is the **swollen, fleshy underground stem** of a plant, bearing **buds** from which **new plant shoots grow**. These **new shoots** use **stored food** in the **tuber** to grow.
Example: The **potato plant** produces large numbers of potatoes, **each** with **several buds** that can **form new shoots**.
3. **Bulbs** - a **bulb** is an **underground short stem** which has one or more **buds** enclosed in special **thick leaves** (or scales) which are **full of stored food** - this gives **energy** to the **buds** when they start to **grow** in the **Spring**.
Example: **Onions, garlic** and **tulips**.



THINKING POINT:



What is the difference between sexual and asexual reproduction?

ENQUIRE, TEST, RECORD, REPORT AND CONCLUDE:

HYPOTHESISE
ENQUIRE
TEST
RECORD
REPORT
CONCLUDE

To dissect a flowering plant to find the main parts

Collect a variety of flowering plants and, in groups, allow the children to carefully dissect the plant to investigate and find the main parts.

How do they compare to one another?

Use laminating pouches to present and label the main parts of each plant.

Alongside this, children can describe the process that each plant goes through to reproduce.

Good plants to dissect include lilies, tulips and daffodils.

KEY ASSESSMENT QUESTIONS AND SCENARIOS:

EXS:

1. Describe and explain, with diagrams, the process of sexual reproduction in flowering plants.

GDS:

1. Explain why some plants have flowers and why it is important for them to attract insects and other pollinators. Why don't all plants have flowers?