

# Plants

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Name \_\_\_\_\_

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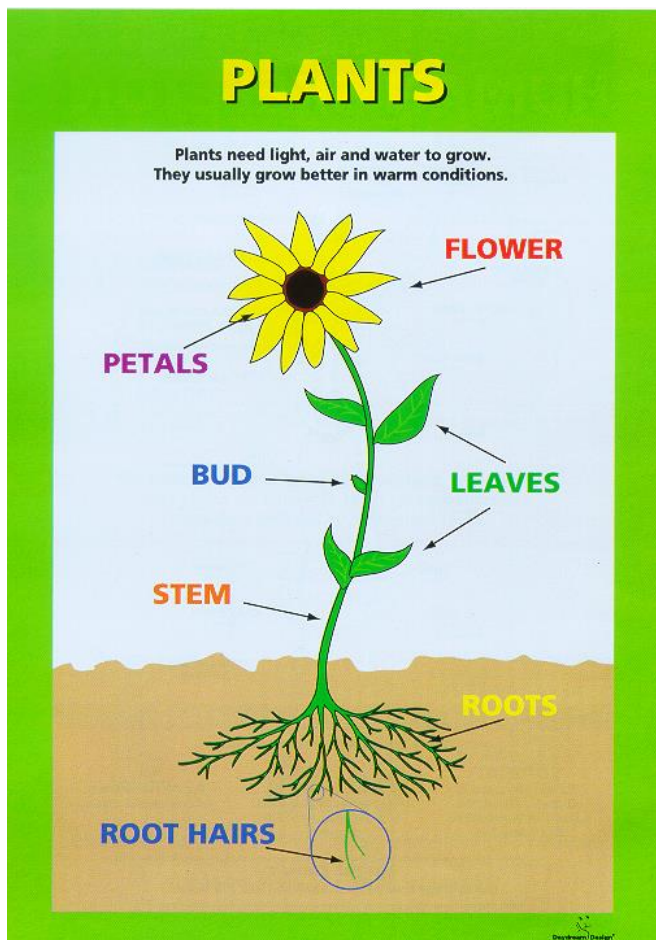
The main difference between plants and animals is how they obtain their food.

The only way an animal can obtain food is by eating something that is (or used to be) alive.

A plant can make food using simple chemicals it can find in the soil or in the air.

Plants make food by a process called **photosynthesis** and this process cannot be carried out by any animal

### The main parts of a flowering plant

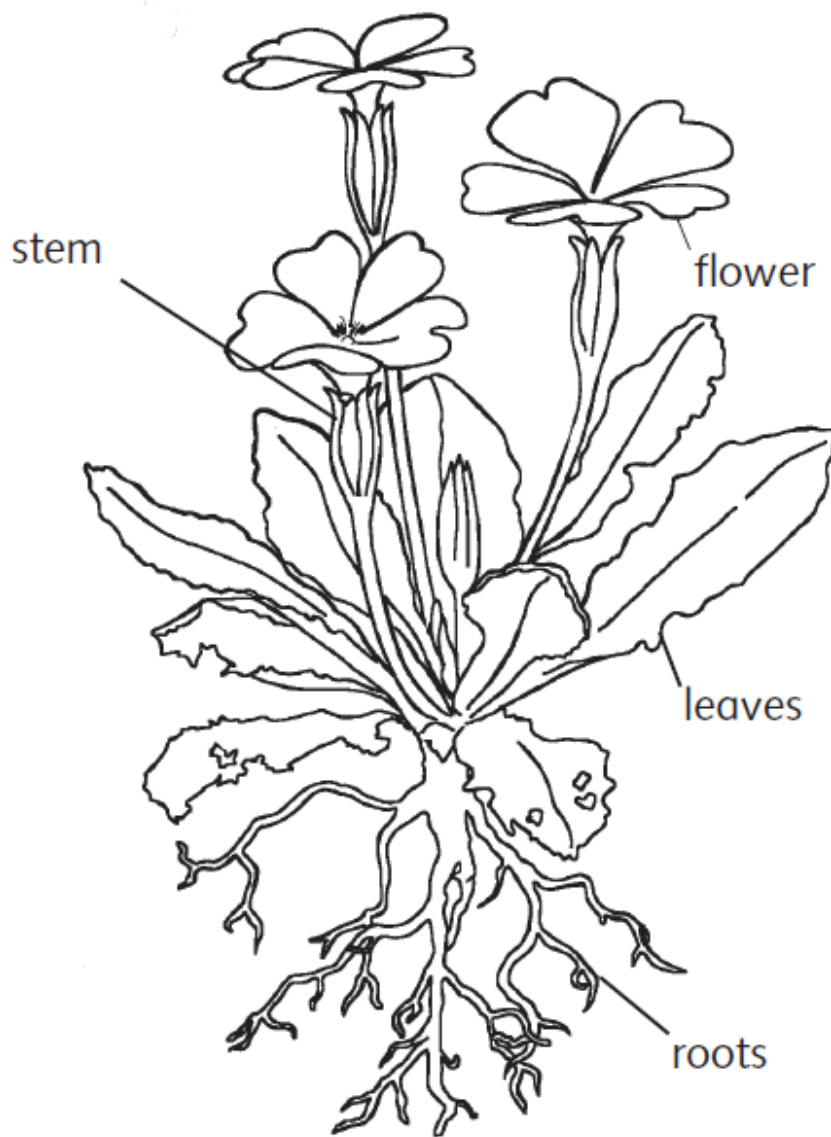


**FLOWER:** Contains the reproductive organs. Where the plant makes seeds. Flowers that are insect pollinated (eg rose) have colourful or scented petals to attract insects. Wind pollinated plants (eg grass) do not have petals

**STEM** Transports food and water around the plant. Holds apart the leaves and flowers.

**LEAVES** Where a plant makes food (a process called photosynthesis). Leaves have a large surface area to absorb as much sunlight as possible.

**ROOTS:** Soak up water and dissolved nutrients from the ground. They support the plant in the soil so it doesn't blow over. The root hairs increase the surface area of the root.



Shade in the different parts of this plant:

**Leaves:** green

**Stem:** a different green (if you have one!)

**Roots:** pale yellow or brown

**Flower:** any bright colour you like

## Quick test:

### Parts of a plant

For each description below add the correct part of the flower

#### **FLOWER, STEM, LEAF or ROOTS**

1. Transports food and water around the plant.....**stem**.....
2. Exchange gases between the plant and the air.....**leaves**.....
3. Where seeds are made .....
4. Holds apart the leaves and flowers.....
5. Where photosynthesis takes place.....
6. Where the reproductive organs are.....
7. Absorbs water and dissolved food from the ground.....
8. Have a large surface area to absorb sunlight.....
9. Supports the plant in the soil so it does not blow over.....
10. Where the plant makes food.....

# Helping a plant grow well

**Conditions needed for a plant to grow and keep healthy**

**Light, Warmth, Air and Water**

(The water needs to contain the correct dissolved nutrients)

## Experiment:

How does light effect the growth of a plant?

1. Take two plant pots with soil and plant two bean seeds in each using the same soil
2. Water each pot with the same amount of water and cover them with a clear container
3. Place the pots in a warm place and wait for the seeds to germinate (when you see a little green shoot)
4. Now place one pot in a dark box and one pot in the light.
5. Measure the height of one of the seedlings in each pot every day for a week

Days after start of experiment	Height of seedling kept in the dark	Height of seedling kept in the light
0 (start of experiment)		
1		
2		
3		
4		
5		
6		
7		
8		
9		

6. Draw a picture of each bean and describe the difference between them.

Why do we use two pots rather than just one?

.....

Why do we place more than one seed in each pot?

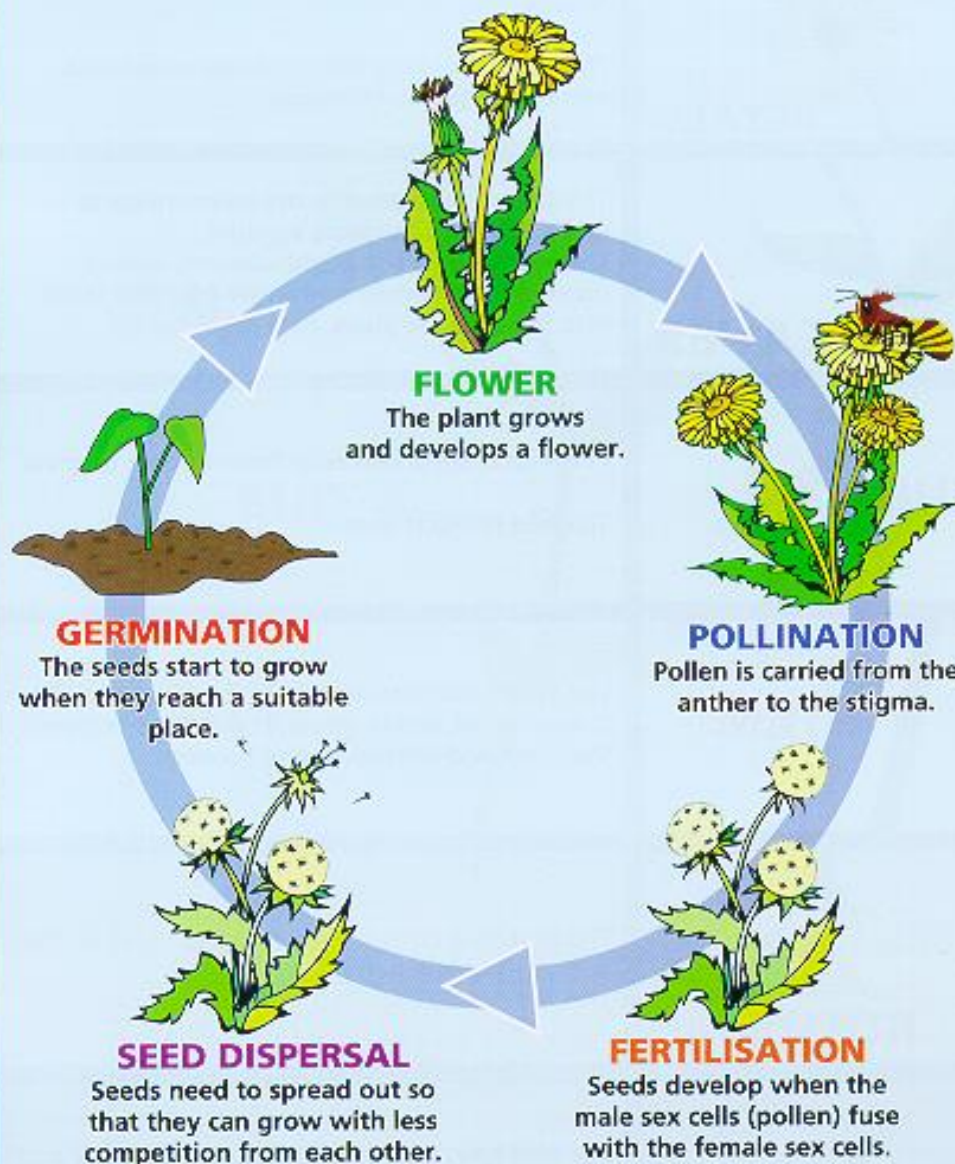
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Describe two conditions that were kept the same to keep it a fair test:

..... and .....

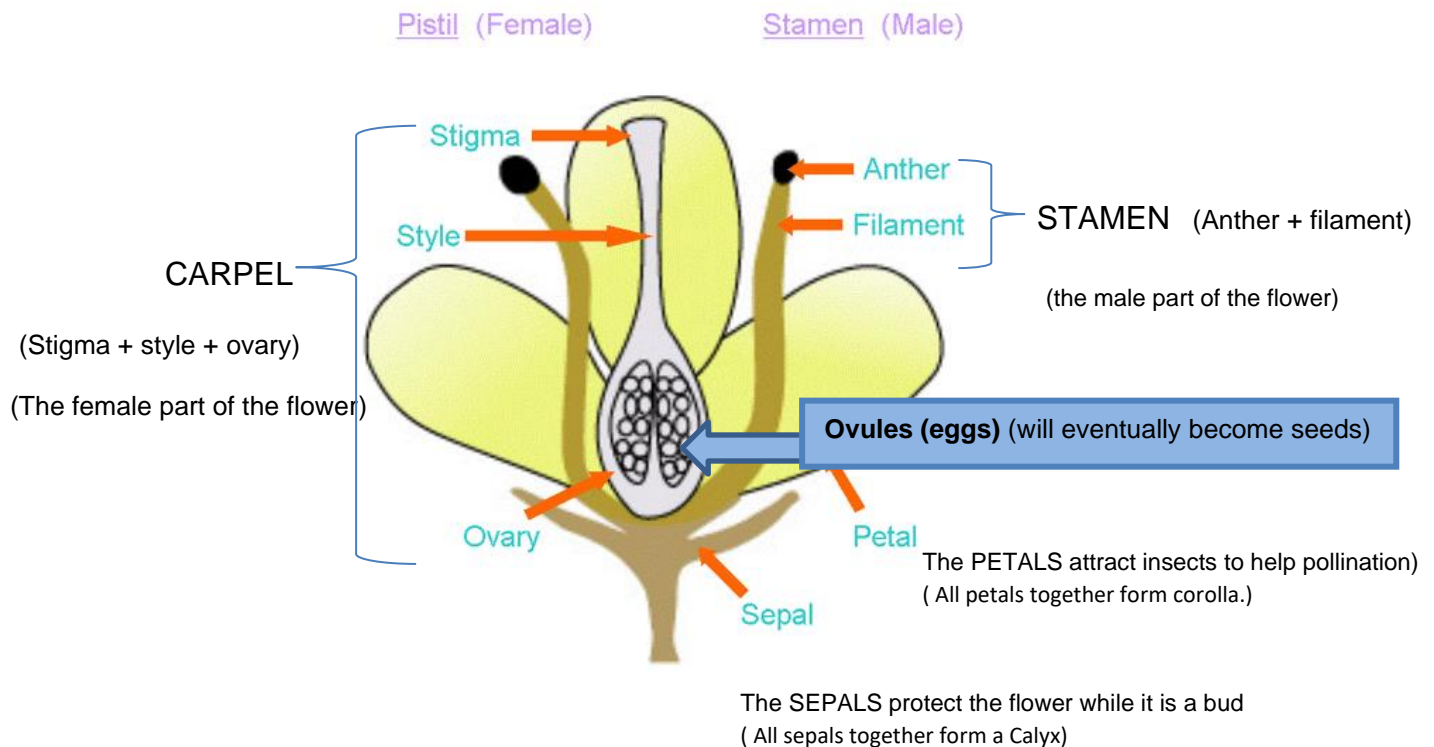
# LIFE CYCLE OF A PLANT

Reproduction is the process by which a plant produces seeds to make a new plant. This life cycle shows the different stages in plant reproduction.





# Inside a flower



## The structure of a flower

**Petals:** Brightly coloured. They are used to **attract insects** by their bright colour and scent.

**Sepals:** Green leaves around the outside of the flower. Sepals are usually smaller than the petals,. Sepals **protect the flower** while it is still in bud.

**Stamens:** This is where **pollen is made**

They are the male part of the flower.

The stamen has two parts: the filament (a thin stalk) and the anther at the top which is where **pollen** is made

**Carpel:** The carpel is the green stalk in the middle of the flower.

It is the female part of the flower.

The carpel has three parts: Stigma, Style and Ovary

**Stigma.** This is where pollen has to land during **pollination**.

**Ovary** contains ovules which will become **seeds**.



## Quick Test

1. Add the following labels to the flower shown below:

***Ovary, Style, Anther, Stigma, Sepal, Petal, Stem***



2. Draw 4 ovules (eggs) where you think you might find them in this diagram.
3. Where would the pollen get made? .....
4. Why are petals usually brightly coloured? .....
5. What are the sepals for? .....
6. On which part of the flower does pollen land during pollination? .....
7. Name the male part of the plant: .....
8. Name the 3 parts of the **carpel** (female part of the flower)  
.....
9. Name the 2 parts of the **stamen** (male part of the flower)  
.....

## Reproduction in flowering plants: Seed formation and dispersal

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There are 4 main stages in the development of a seed

1. Pollination
2. Fertilization
3. Seed dispersal
4. Germination

**1. Pollination** is when pollen (from the male *anther* of one plant) reaches the female *stigma* of another plant

Some plants are pollinated by insects. (example = Rose)

Insects are attracted by the colour and smell of the petals and go from one plant to another to drink nectar. They get covered in pollen which is carried to the stigma of another plant.

Some plants are pollinated by the wind. (example = Grass)

These plants do not have coloured petals but long male stamens

**2. Fertilization** is when the pollen grain (male sex cell) joins up with the ovule (female sex cell)

After fertilization the ovules (or eggs) turn into seeds

The part of the flower surrounding the seed is known as the **fruit**.

**Pollination = getting pollen to the stigma**

**Fertilization = joining of the pollen and the ovule**

### **3. Seed dispersal**

The job of the fruit is to carry the seeds as far as possible from the parent plant so the new plants have room to grow and do not **compete for resources** such as light, water and nutrients in the soil.

This process is called **seed dispersal**.

**A plant will disperse its seeds four main ways:**

#### **1. Animals**

a). The fruit is eaten by animals such as birds but are not digested. The seeds pass out the animal along with its droppings eg cherry, blackberry. These fruits look and taste nice.

b). The fruits have little hooks. The hooks stick to the fur of animals and later drop off. Example: burdock.

## 2. Wind

The fruits have wings or hairs and this lets them get carried by the wind,  
Example: sycamore trees have winged fruits.

## 3. Water

The seed floats and can be carried away by water eg Pond Iris

## 4. Explosions

. The fruit splits open. sometimes this happens with a lot of force and the seeds are shot out.  
Example: beans. The pod is the fruit and the beans are the seeds.

## Animals



Blackberry. (Sweet taste and bright colours)

Burdock (little hooks catch on the fur of animals)

## Wind



Sycamore

## Dandelion

(The seed has a feathery top that catches the wind. The wind blows the seeds away)

## Water



Pond Iris (Seeds float away)

## Explosions



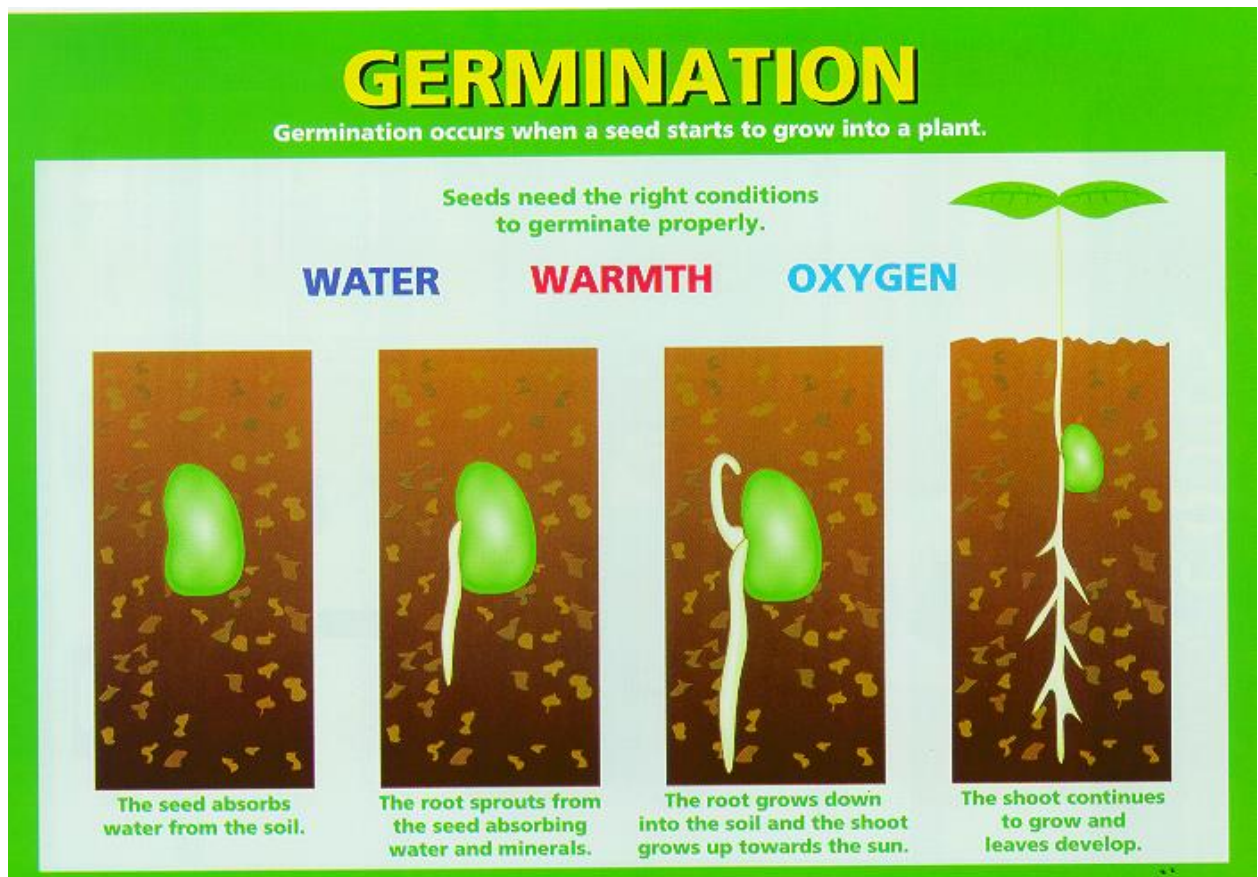
Peas are in a pod. The pod dries and splits open flicking out the seeds

## 4. Germination

The seeds eventually land somewhere suitable and when conditions are right it will start to grow

Seeds need the following conditions to germinate

- Water
- Warmth
- Oxygen



## Growth

With the right conditions the young shoot will eventually grow into a mature plant, produce flowers and then seeds of its own

**Conditions needed for a plant to grow and keep healthy**

**Light, Warmth, Air and Water**

(The water needs to contain the correct dissolved nutrients)

1.

The table below shows the parts of a plant and the main function for each part.

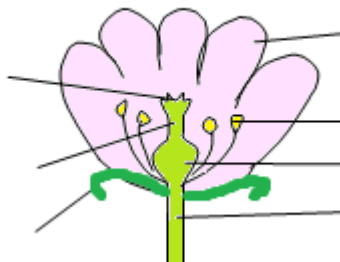
Join up the part of the plant with its function using a line.

<b>Flower</b>	<b>Transport food and water around the plant</b>
<b>Stem</b>	<b>Takes water and food from the ground</b>
<b>Leaf</b>	<b>Makes Food</b>
<b>Root</b>	<b>Where the seeds are made</b>

2.

a) Add the following labels to the flower shown below:

***Ovary, Style, Anther, Stigma, Sepal, Petal, Stem***



b) Draw 4 ovules (eggs) where you think you might find them in this diagram.

c) Where would the pollen get made? Anther, Style, Stigma or Ovary?

(circle correct answer)

d) What are the petals for? .....

e) What are the sepals for?  
.....

f) On which part of the flower does pollen land during pollination?

Anther, Style, Stigma or Ovary? (circle correct answer)

3. Is a rose pollinated by Insects or the wind?.....

Give a reason for your choice:.....

(you don't need to say the reason for **why** its pollinated, but the reason for your answer for **how** its pollinated)

4.



The diagram shows some seeds from a dandelion plant.

a) Use an arrow to label the exact position of the seed in the picture

b) How are dandelion seeds dispersed? (underline the correct answer)

By **water**    by **wind**    by **getting stuck to animals fur**    by the **fruit exploding**

c) What is special about the design of the seeds to help them get dispersed in this way

.....

5. It would be easier for the dandelion just to let its seeds fall to the ground.  
How does it help the seeds grow if they get moved away from its parent?

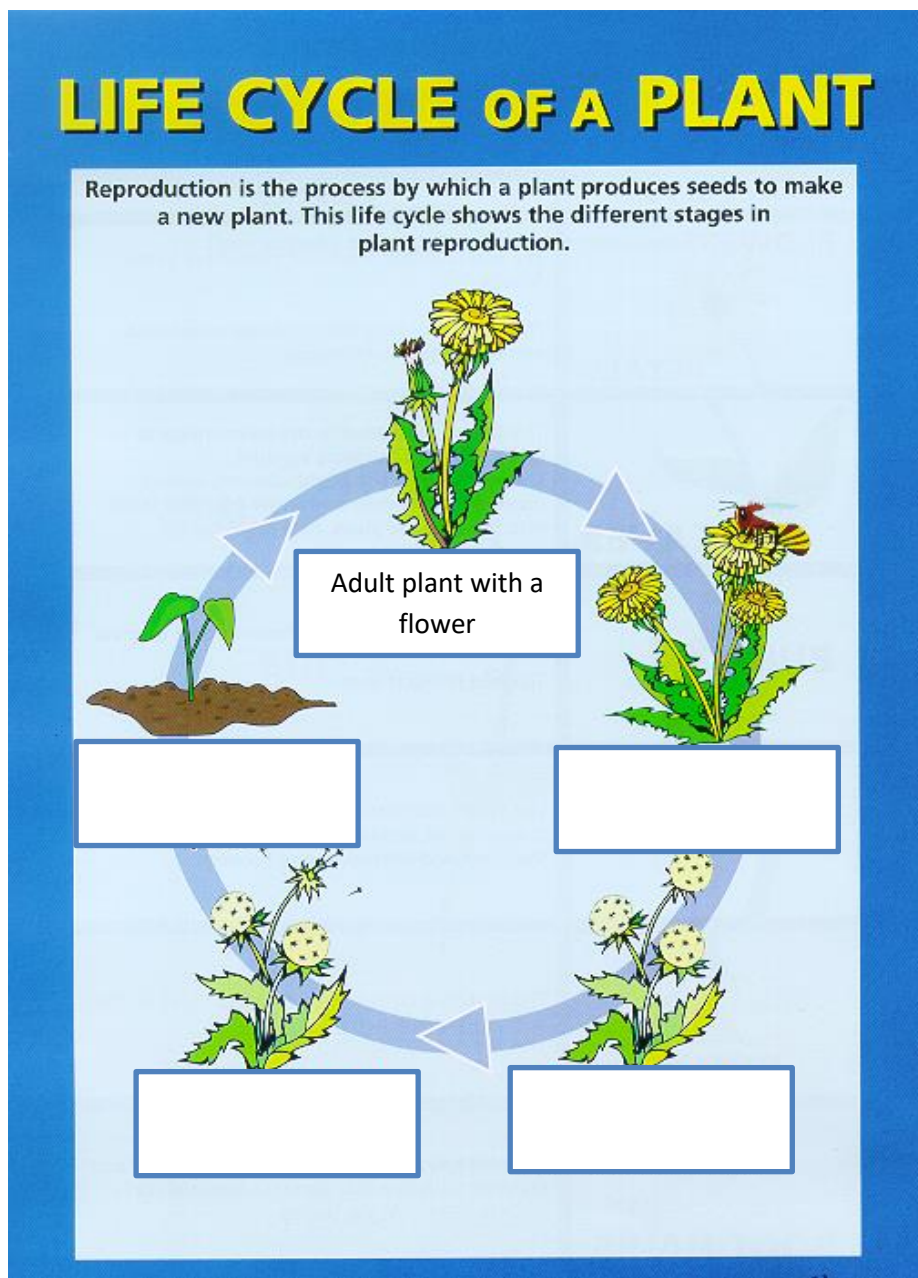
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6.    ☐ Warmth            ☐ Oxygen            ☐ Light  
      ☐ Water        ☐ Soil                ☐ Fertilizer

Tick **THREE** of the above to show what conditions are needed for seeds to germinate



This diagram shows the life cycle of a flowering plant



Fill in each box with one of the words below to show the correct order for each process

- A: Adult plant with a flower (done for you)
- B: Germination
- C: Pollination
- D: Seed Dispersal
- E: Fertilization



# PHOTOSYNTHESIS

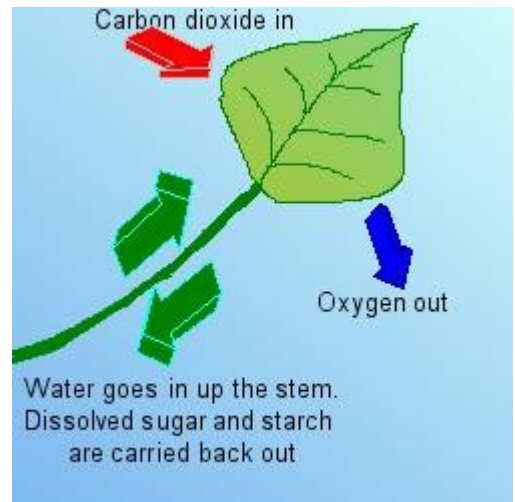
Photosynthesis is the name of the process by which a green plant makes food.

The plant takes CARBON DIOXIDE from the air and WATER from the soil and joins them together to form STARCH and SUGAR.

Photosynthesis is very important because the plants provide all animals, including us, with food.

OXYGEN is released as a waste product.

The energy for the process comes from the SUN which is absorbed by the leaves (with the help of a green chemical called chlorophyll)



## Demonstrating Photosynthesis

Photosynthesis produces oxygen gas.

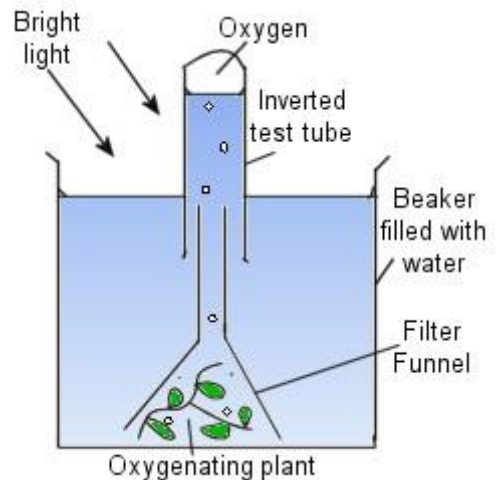
Photosynthesis can be demonstrated by collecting the oxygen being produced.

A test-tube is placed up-side-down over a piece of pond weed in a beaker filled with water.

The whole apparatus is placed in bright light.

After a few days oxygen collects in the test tube.

We prove that the gas is oxygen by testing it with a glowing splint which relights.



### Quick test

1. What two substances are used up by the plant during photosynthesis? ..... and .....
2. What gas is released during photosynthesis?.....
3. From where does a plant obtain the energy it needs to carry out photosynthesis? .....
4. Explain why is photosynthesis such an important process for animals ?

.....