



# Firrhill High School



## Summary Files B3: Plant Power



### WHAT SHOULD I KNOW?

Success Criteria	Before reading	After reading	Before my test
I can name several examples of plant uses.			
I can state the purpose of photosynthesis.			
I can explain the photosynthesis equation.			
I can state the products of photosynthesis.			
I can explain what happens to (the fate of) spare glucose.			
I can name the pigment found in chloroplast.			
I can describe the purpose of stomata.			
I can explain what a pigment is.			
I can name three pigments and state their colour.			
I can describe the difference between evergreen and deciduous plants.			
I can define the term germination and state the three things needed for seeds to germinate.			
I can name the structure that water moves through a plant in.			
I can name the process of water moving through a plant.			
I can explain various methods of plant propagation.			
I can explain the importance of protein for plants.			
I can name the three elements found in fertilisers.			

# THE IMPORTANCE OF PLANTS

## What are plants and why are they useful?

Plants are **living things** (organisms) that can make their own food by using the light from the sun. Trees, grasses and flowers are all examples of plants.

Plants have many uses:



Plants can be food for us and other animals.



Bees use pollen to make honey.



Trees can be used to make paper.



Flowers can be used to make gardens look nice.



Plants can be used in perfumes and toiletries.



Plants like aspirin are used to make some medicines.



Plants like chamomile and pine are used in construction.



Plants like cotton are used to make clothes.



Amber is a resin that is used in jewelry & found inside trees.



Rubber is also a resin found in trees.



Maple syrup is also found inside trees.

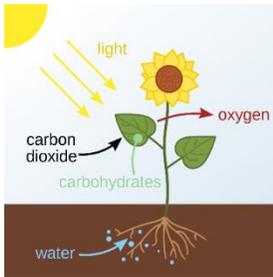


Plants are used as a home (habitat) by animals.

# PHOTOSYNTHESIS

## How do plants make their own food?

Photosynthesis is how plants turn light energy into chemical energy which they can use as food.



Plant cells contain chloroplasts. Inside the chloroplasts there is green pigment called chlorophyll which is needed for photosynthesis.

Photosynthesis can be written as a word equation.



The raw materials of a chemical reaction are on the left-hand side of the arrow, they are what is needed to start the reaction. **Carbon dioxide and water are the reactants of photosynthesis.**

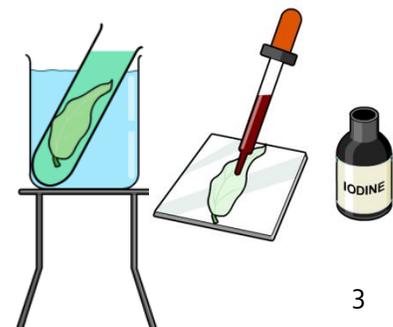
The products of a chemical reaction are on the right-hand side of the arrow, they are what is made in the reaction. **Glucose and oxygen are the products of photosynthesis.**

**Light energy and chlorophyll are needed for photosynthesis to take place.**

**The glucose made by the plant is stored as starch.**

We can test a leaf for starch to see if it is photosynthesising.

1. The leaf was boiled to soften the cell walls and make it easier for the iodine to get in.
2. Then the leaf was placed in alcohol to remove the chlorophyll to make it easier to see a colour change.
3. The leaf is softened again by placing it in hot water.
4. Finally, 1 drop of iodine is added.  
Iodine turns black if starch is present.



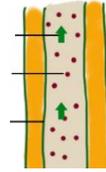
# PLANT STRUCTURES & PIGMENTS

Different parts of a plant have different jobs.



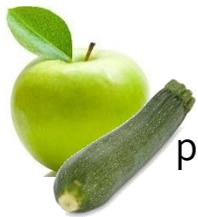
**Stomata**

Stomata are small holes in the leaf that let in carbon dioxide and let out oxygen.



**Xylem**

**Xylem** are small tubes that water travel around a plant. The movement of water upwards through a plant is called **transpiration**.

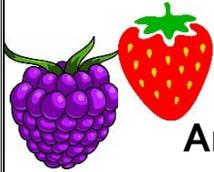


**Chlorophyll** is a green pigment found in vegetables.

**Carotenoid** is a yellow/orange pigment found in things like carrots.



**Pigments** are chemicals that cause colour change in a plant.



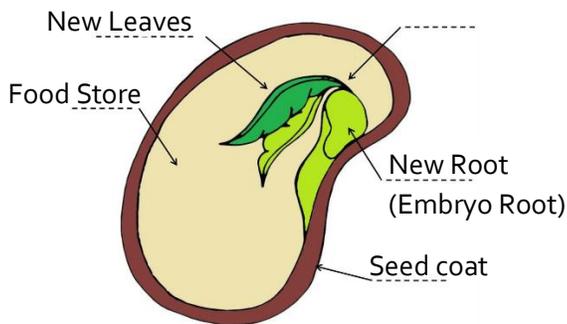
**Anthocyanin** is a red/purple pigment found in things like berries.

**Tannins** is a brown pigment found in coffee beans and brown leaves.



## GERMINATION (SEXUAL REPRODUCTION)

HOW PLANTS FIRST START TO GROW



Germination is the name given to a seed when it begins to grow.

Plants **do not** need sunlight to germinate because there is a food store for the first part of growth.

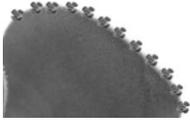
For plants to germinate they need **warmth, oxygen** and **water**. Just think **WOW!**

Collecting and plating seeds is the easiest way to propagate (grow more) plants.

# PLANT PROPAGATION (ASEXUAL REPRODUCTION)

## TINY PLANTS ARE CALLED PLANTLETS

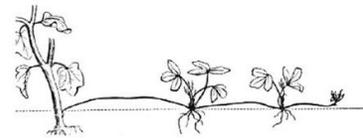
### Leaf Plantlets



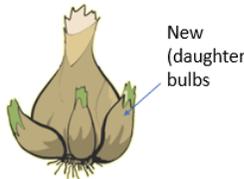
Some plants can produce tiny leaves called leaf-plantlets. Leaf plantlets get their food from the main lead and when the leaf plantlets are big enough they will drop off (or be removed by humans) to grow on their own.

Some plants produce runners. These are long off-shoots from a stem. Plantlets can grow on runners and fall off when they are big enough to make their own food.

### Plantlets from Runners



### Bulbs



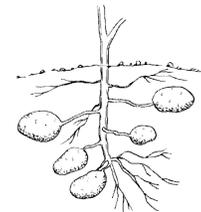
Some plants like daffodils, tulips and hyacinths store food inside bulbs (oval shaped lumps in the ground).

New bulbs grow from these and can separate to grow into plantlets.

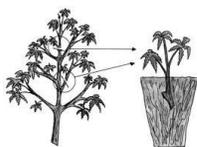
Some plants store food in tubers. A potato is an example of a tuber.

Plantlets can grow from these tubers and will separate from the main plant when they are big enough to produce their own food.

### Tubers



### Cuttings



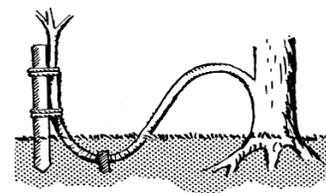
Cuttings are an **artificial** way of propagating plants.

Cuttings from a plant needs to be taken at a node. Nodes are points on a stem where a new branch grows.

Layering is another **artificial** way of propagating plants.

This is when humans bury part of a flexible stem in the soil which makes it grow roots and turn into a plantlet.

### Layering



# DESIDUOUS & EVERGREEN PLANTS

## What do plants do in the winter?

In the winter the temperature drops (it becomes colder) and there is less sunshine for plants to photosynthesise. Plants have two different ways of dealing with this.



**Deciduous Plants**

Deciduous plants lose the parts they do not need (their leaves) over winter.

Plants become *dormant* (like falling asleep) over winter.



**Evergreen Plants**

Evergreen plants stay green all year. Most have thicker, spiky needles or leaves.

Plants continue to grow over winter but growth will be much slower than spring or summer.

# FERTILISERS

## How can we make plants grow bigger and quicker?

All plants need protein to grow (just like we do!)

Fertilisers were first discovered during World War 1. It is thought that as many as 1/3 of the earth's population are only alive today because Scientists discovered new ways to grow more food!

Fertilisers contain three elements that help plants grow:

**Nitrogen (N), Phosphorous (P) and Potassium (K).** Plants which do not have enough of an element are said to be *deficient*.



<b>Nitrogen (N)</b>	<i>Nitrogen deficiency</i> makes plants produce less chlorophyll, turning them yellow and stops the plant from photosynthesising as well.	
<i>Phosphorous deficiency</i> makes plant grow much slower and not as tall.		<b>Phosphorous (P)</b>
<b>Potassium (K)</b>	<i>Potassium deficiency</i> makes plants turn brown and curl up.	

