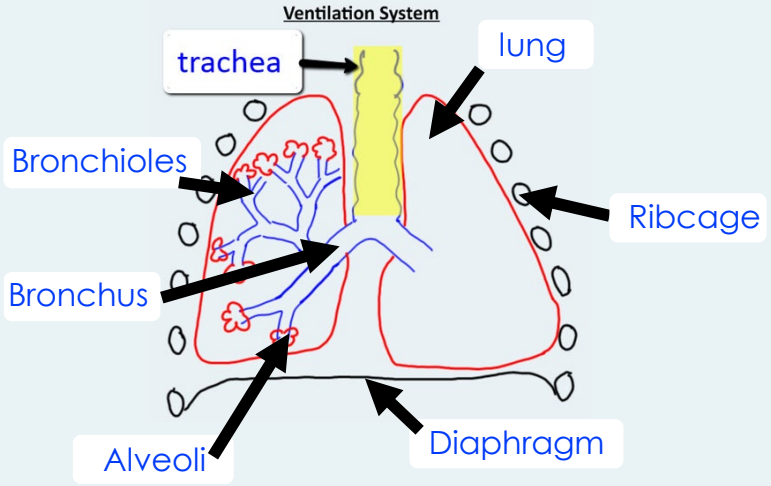
Year 7 - Science - Summer Term - Biology - Key terms and Checklist

Keyword List	Definition
Stamen	Contains the anther
Anther	Produces pollen (sex cell)
Ovary	Where ovules are made
Ovule	Female sex cell in a plant
Stigma	Receives pollen
Petals	Coloured/scented to attract pollinators
Pollination	When pollen from anther is transferred to the stigma
Fertilisation	When the nucleus of pollen grain fuses with the nucleus of the ovule
Dispersal	When seeds are spread out from the parent plant
Photosynthesis	The chemical process in which plants and alga use energy form the sun to make glucose
Chloroplast	Organelles which are responsible for photosynthesis
Chlorophyll	A green pigment inside chloroplast
Stomata	Tiny holes on the underside of a leaf
Root hair cell	A specilaised cell which makes up the root of a plant
Digestive system	Organ system responsible for digesting food.
Diet	Meals contains good amount of carbohydrates, protein, fiber, vitamins/minerals, fats
Aerobic respiration	The process of producing energy using oxygen
Aerobic respiration	The process of producing energy without the use of oxygen
Lungs	The organ responsible for breathing/ventilation
Alveoli	Tiny air sacs in the lungs responsible for gas exchange
Fermentation	The process carried out by yeast to produce beer

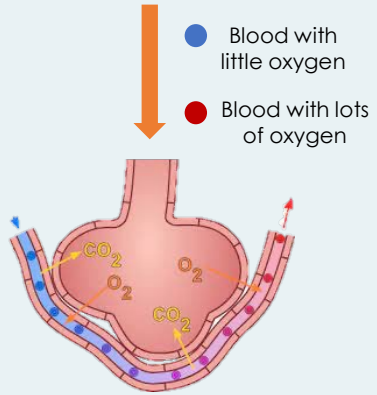
Biology term 3 checklist	✓
Be able to label the parts of a flower	
State the two types of pollination	
Explain how seeds are dispersed	
Be ale to describe what photosynthesis is	
Recall the equation for photosynthesis	
Describe the function of chloroplast	
To describe the function of the roots	
Describe the adaptations of the leaf	
Describe aerobic respiration	
Describe anerobic respiration	
Be able to label a diagram of the lungs	
Describe the purpose of the alveoli	
State what is produced in anaerobic respiration in humans	
State what is produced in anaerobic respiration in yeast	

Biology – Gas Exchange

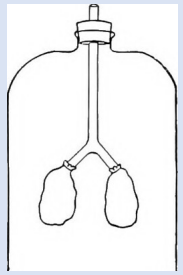
Gas exchange system



This is a close of the alveoli. They are tiny air sacs which fill both lungs. This is where gases are exchanged.



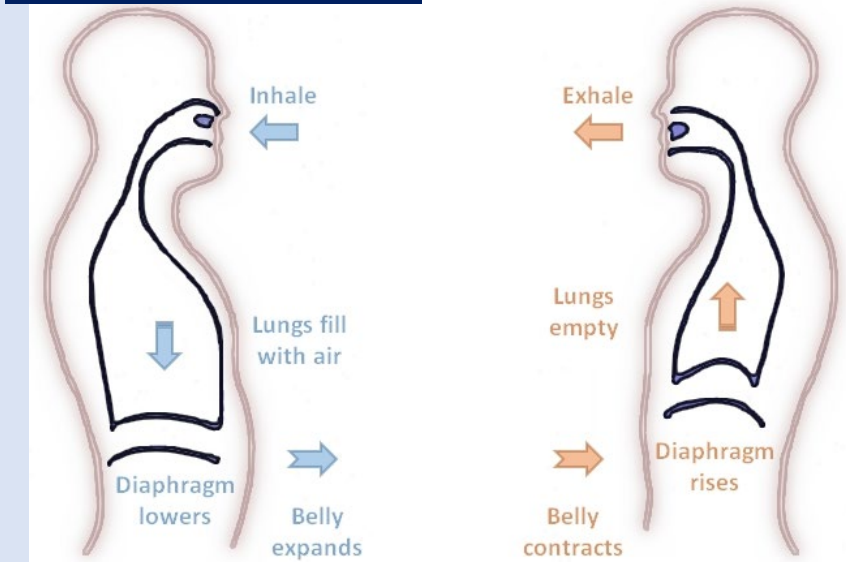
Bell jar lung model



Link to video for bell jar model:

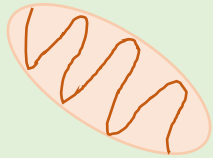
https://www.youtube.com/watch?v=NYT0qlKwHuI

Breathing in and out



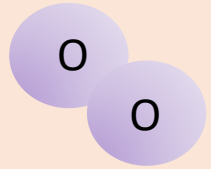
Biology – Respiration

Respiration



Respiration is the process of **releasing energy** from **glucose**.
It takes place in the **mitochondria** of the cell.

Aerobic Respiration



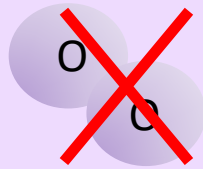
Aerobic respiration is producing energy **with oxygen**.
We do this all the time (its what keeps us alive!)

The equation for respiration is:

Glucose + Oxygen → Carbon dioxide + water (+energy)

Energy released is used in many ways including;
muscle contraction, **keeping warm** and **making proteins**

Anaerobic Respiration



Anaerobic respiration is producing energy **without oxygen**.
We do this all the time (its what keeps us alive!)

It happens in 2 situations:

In humans (during hard exercise)

Glucose → lactic acid (+energy)

Lactic acid causes pain in muscles.

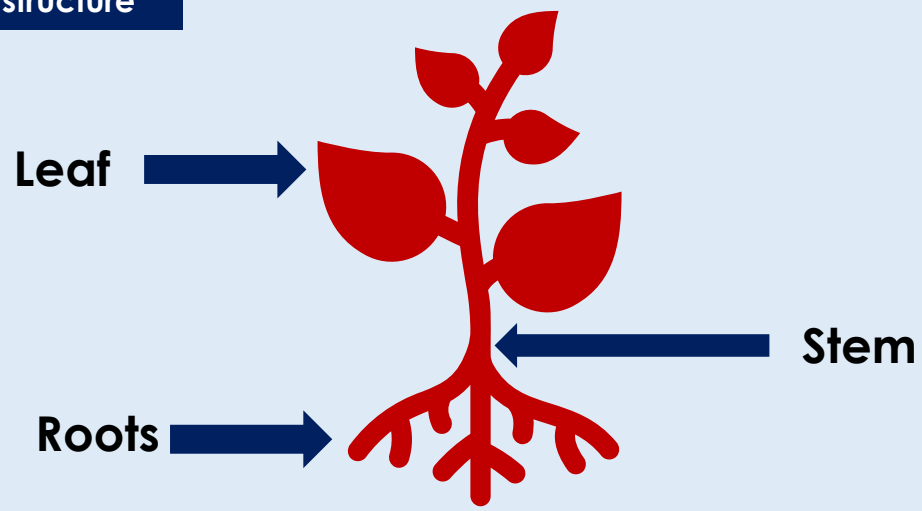
In yeast (a microorganism)

Glucose → ethanol + carbon dioxide + (+energy)

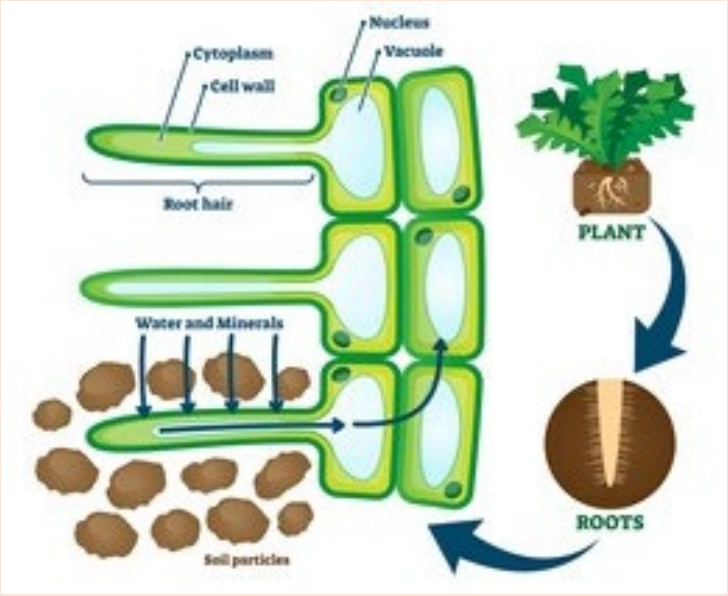
This process is called **fermentation**. It makes beer!

Biology – Photosynthesis

Plant structure



Roots



Roots of a plant absorb:

MINERALS
WATER

Minerals are needed by the plant to keep the plant healthy.

Water is needed by the plant in order to do photosynthesis.

Root Hair Cells

Root hair cells are specialised cells found in the roots of plants. They have a special shape to absorb as much water as possible.

Photosynthesis

Photosynthesis – a chemical process where plants and algae use energy from the Sun to make glucose

$$\text{Carbon dioxide} + \text{Water} \xrightarrow[\text{chlorophyll}]{\text{light}} \text{Glucose} + \text{Oxygen}$$

Chlorophyll

Chlorophyll is a **GREEN** pigment found in chloroplasts which absorbs sunlight.

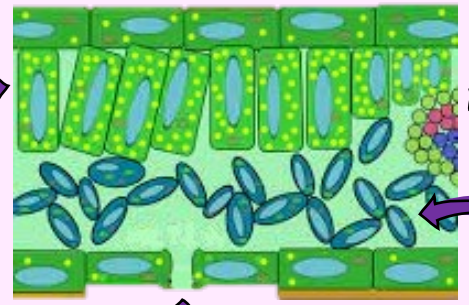
Chloroplasts

Photosynthesis happens in the chloroplasts. Chloroplasts are ONLY found in plant cells because animals do not do photosynthesis.

Adaptations of Leaves for Photosynthesis

Large surface area allows **more light** to be absorbed

Chloroplasts are mostly **towards the top** of the leaf in order to get more light



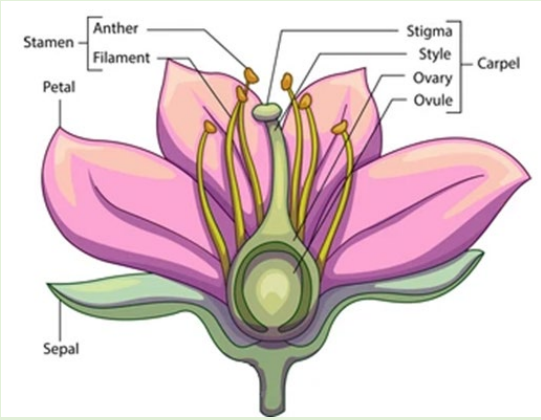
Veins deliver water to cells and take glucose away for other parts of the plant

Air spaces between cells allow gases and water vapour to move around the leaf

Small holes called **stomata** allow **gas exchange** and water vapour to leave the plant

Biology - Plant reproduction

Flowers are the reproductive organs of plants. They produce the male and female sex cells (gametes).

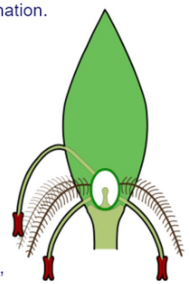


Pollination occurs when the pollen is transferred from anther to stigma. The pollen can be transferred by wind or animals (usually insects).

Some flowers are adapted for wind pollination. These adaptations include:

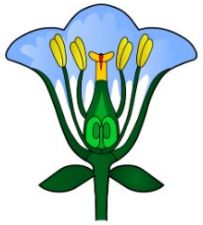
- very light pollen
- large number of pollen grains
- large anther outside the flower
- feathery stigma outside the flower.

They also tend to have small, dull petals, no scent and no nectar.



Insect-pollinated plants have flowers that are adapted to attract insects. They tend to have:

- large, brightly coloured petals
- a sweet smell
- nectar
- sticky or spiky pollen.



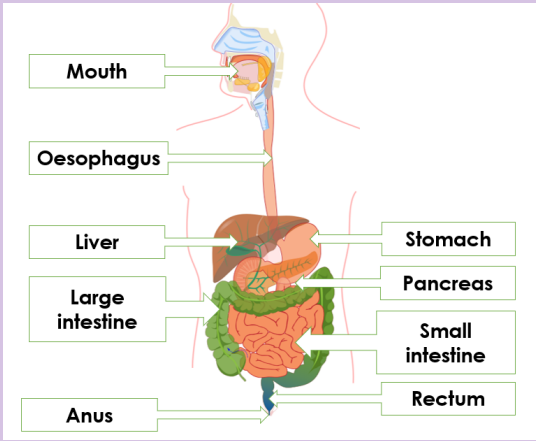
The anther and stigma are found within the flower.

Fertilisation is when the nucleus of the pollen fuses with the nucleus of the ovule. This produces a seed which will grow into new plant. Seeds are spread (dispersed) in various ways to avoid competition with the parent plant. Methods include: wind, water, animals (carried, buried, eaten) and explosion.

Biology – Digestion

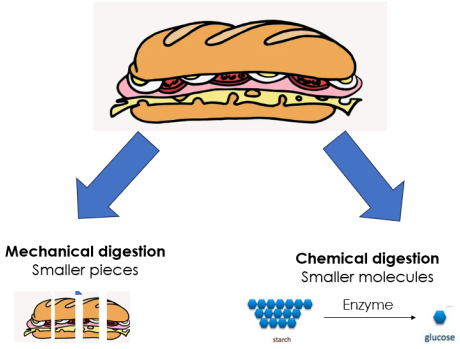
Healthy diet and food groups

The digestive system



Digestion

Food is broken down (digested) by two actions



Journey of food

Mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus

Chemistry - Key terms and Checklist

Keyword List	Definition
Acid	A substance which has a pH ranging from 0-6
Base	A substance which can neutralise an acid
Alkali	Are bases which can dissolve in water
Neutral/ Neutralisation	A substance which has a pH of 7
Concentrated	A substance which has more water particles then solute
Dilute	A substance which has less water particles then solute
pH	Ranges from 0-14 to show if a substance is an acid, alkali or neutral
Indicator	A substance to show the pH of another substance
Acid	A substance which has a pH ranging from 0-6

Chemistry term 3 checklist	✓
State the difference between an acid, alkali and base	
Understand parts of the pH scale and give some examples of items	
Define a neutralisation reaction	
Name different salts	
Describe ways in which we can test pH	

Chemistry – Acids and Alkalis

What are acids and bases?

Acid – Corrosive substance with a pH lower than 7.

Base – A substance that reacts with an acid to neutralise it and produce a salt.

Alkali – A base that dissolves in water.

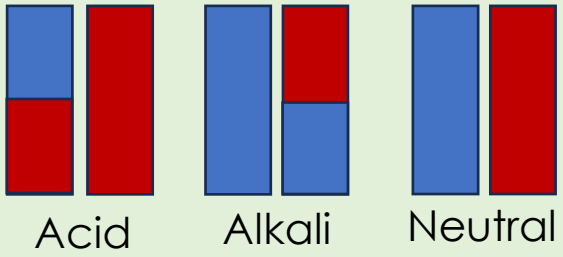
Neutral – A substance that is not acid or alkaline.

Acids	Alkalis	Neutral
Vinegar	Soap	Water
Fruit Juice	Oven Cleaner	Cooking oil

Indicators

Indicators – A substance that will **change colour** depending on if a substance is **acid** or **alkali**.

Litmus paper can be red or blue.

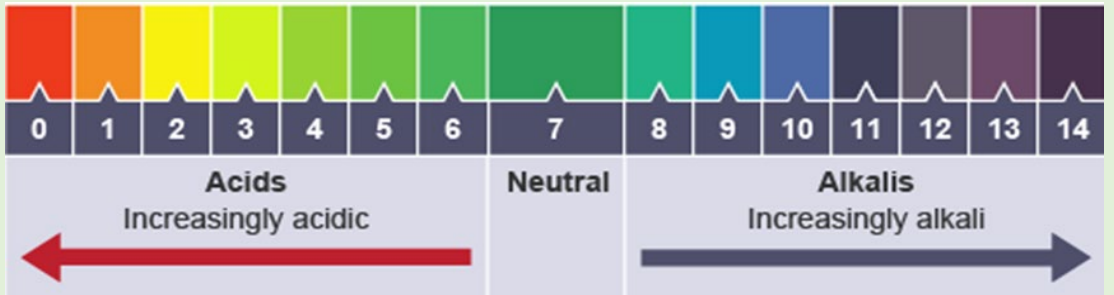


Blue litmus turns red in acid

Red litmus turns blue in alklali

pH Scale and Universal Indicator

Universal indicator solution show what colour a certain pH is:



pH Scale – number scale from 0-14 telling us how acid or alkaline a substance is. Neutral substances are exactly pH 7 | Acids have a pH of less than 7 | Alkalis have a pH of more than 7.
The further from 7 the stronger the acid or alkali.

Chemistry – Acids and Alkalis

Rules for Naming Salts

Salts always have **two** names.
First name – **metal** taken from the **base.**

*E.g. Salts made with **sodium** hydroxide will always start with **sodium**.*

Second name – comes from the type of **acid** used.

Hydrochloric acid – chloride
Sulfuric acid – sulfate
Nitric acid – nitrate

Neutralisation Reactions

If you mix an acid and base together a **neutralisation** reaction occurs.
A **neutral** solution is made.

Acid + Base → Salt + Water

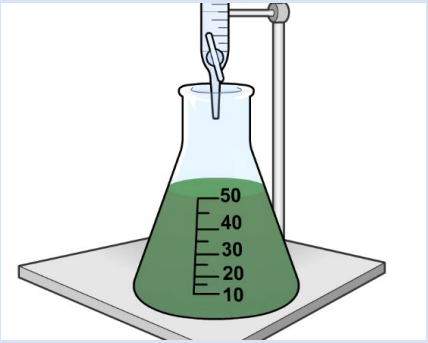
Acid + Metal → Salt + Hydrogen

Acid + Carbonate → Salt Water + Carbon dioxide

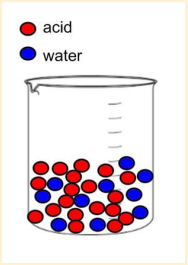
Making a Neutral Solution

To make a neutral solution you need to mix together **exactly** the right amount of acid and alkali.

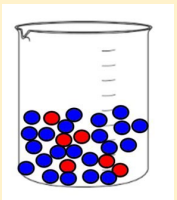
An indicator is needed to know when we have added the right amount.
Universal indicator will turn **green.**



Concentrated and Dilute



Concentrated
Many acid particles to few water particles.
Often corrosive



Dilute
Many water particles to few acid particles.
Often irritant

Physics – Key terms and Checklist

Keyword List	Definition
Work done	is a measure of the energy transferred when a force acts over a distance.
Power	is the amount of energy transferred or work done in certain time
Thermal Energy	How much energy is stored in a substance due to the vibration of its particles
Temperature	A measure of the average kinetic energy of particles
Radiation	Transfer of thermal energy as a **wave**
Convection	Transfer of thermal energy when particles in a **fluid** are heated.
Thermal conductor	Material that allows heat to transfer through it quickly .
Conduction	Transfer of thermal energy by the vibration of particles.
Thermal Insulator	Material that only allows heat to travel through it slowly .

Physics term 3 checklist	☑
Be able to identify energy stores and energy transfers	
Be able to calculate work	
To be able to calculate power	
I can explain how a method of thermal insulation works in terms of conduction	
I can sketch a graph to show the pattern of temperature change against time	
I can explain how a method of thermal insulation works in terms of convection	
I can sketch diagrams to show convection currents	
I can identify that radiation does not require particles	
I can describe which materials absorb/emit radiation	

Physics – Energy stores and Transfers

Energy

Energy – can be in different 'stores'.

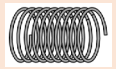
- Energy cannot be created or destroyed, but it can be transferred from one energy store to other energy stores.
- Energy is measured in Joules

Energy Stores

Kinetic store – is filled when an object speeds up, and it empties when an object slows down

Gravitational store – is filled when an object is raised, and it empties when an object falls or is lowered

Elastic store – is filled when it is stretched or compressed



Chemical store – is emptied during a chemical reaction when energy is transferred to the thermal store of the surroundings

Thermal store – is filled when a substance is heated, and it is emptied when the substance cools down

Energy Transfers

Energy can be transferred from one store to another in four ways:

Mechanical work – a force is applied to move an object, for example when a person lifts a book onto a high shelf

Energy in chemical store in muscles → Energy transferred by mechanical work → Energy in gravitational energy in book

Electrical work – charges flow in the form of electricity, for example in a battery powered toy train

Energy in chemical store in battery → Energy transferred by electrical work → Energy in kinetic store toy car

Heat transfer – energy moves from the thermal store of a hotter object to the thermal store of a cooler object, for example when a handwarmer is used to warm up your hands.

Energy in thermal store in handwarmer → Energy transferred by conduction → Energy in thermal store hands

Radiation - when energy is transferred as a wave, for example a grill cooking food using infra-red radiation.

Energy in thermal store in grill → Energy transferred by Infrared radiation → Energy in thermal store of food

Physics – Work and Power, and Heating and Cooling

Work

Work - is a measure of the energy transferred when a force acts over a distance. **Energy transferred = Work**

Work done equation

$$W = F \times d$$

Power

Power - is the amount of energy transferred or work done in certain time

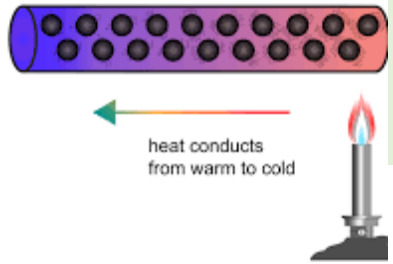
Power equation

$$P = W/t$$

Power in watts (W) = Work (J) ÷ Time (s)

Conduction

Conduction is the method of **thermal energy** transfer through solids. When particles are heated, they gain energy and begin to **vibrate**. This causes them to collide with neighbouring particles and the energy is passed along.

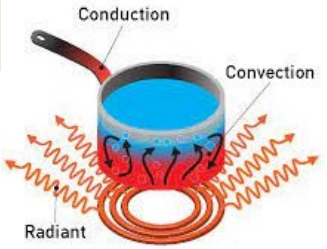


Convection

Convection is the method of **thermal energy** transfer through fluids (liquids and gases). When particles are heated, they gain energy and begin to **vibrate**. Particles with more energy rise to the top and those with less energy sink. This process continues, forming a convection current, until all the fluid is heated.

Radiation

Radiation is the method of **thermal energy** transfer via waves. This does not need particles as these waves can travel through a vacuum.



Conductors and Insulators

Thermal conductors allow thermal energy to pass through quickly and easily. An example of a thermal conductor are **metals**

Thermal insulators do NOT allow thermal energy to pass through quickly or easily – it is very slow and difficult. Examples of thermal conductors are most non-metals and wood/plastic etc.

Temperature change over time