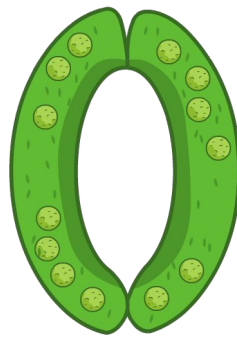


Biology

GCSE Plant Organisation

Learned Revised Confident

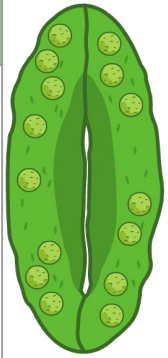
_____ % Achieved: _____



1

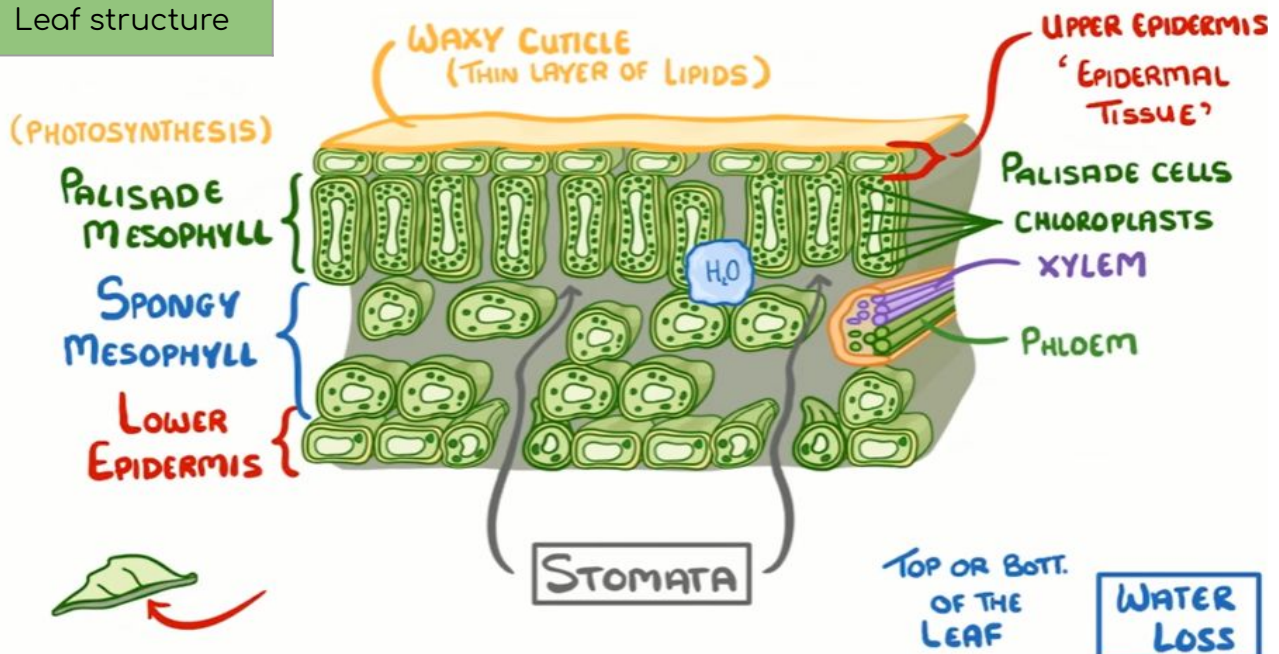
Guard cells

When there is plenty of water, the guard cells swell and become turgid, opening the stomata. When short of water, the guard cell loses water, becomes flaccid and the stomata close. They are also sensitive to light.



Nº	Keyword	Definition
2	Guard cell	A cell which controls the opening and closing of the stomata.
3	Meristem tissue	Plant tissue found at the tips of roots and shoots made of actively dividing cells that can differentiate.
4	Palisade mesophyll	A plant tissue that contains lots of chloroplasts to carry out photosynthesis.
5	Phloem	A plant tissue that transports dissolved sugars from the leaves to other parts of the plant.
6	Spongy mesophyll	A plant tissue that contains large air spaces and has a large surface area for diffusion
7	Stomata	Small openings in the surface of a leaf that allow gases to diffuse into the leaf.
8	Translocation	The movement of dissolved sugars from the leaves to the rest of the plant, via the phloem.
9	Transpiration	The loss of water vapour through the stomata.
10	Xylem	A plant tissue that transports water and mineral ions from the roots to the stems and leaves.

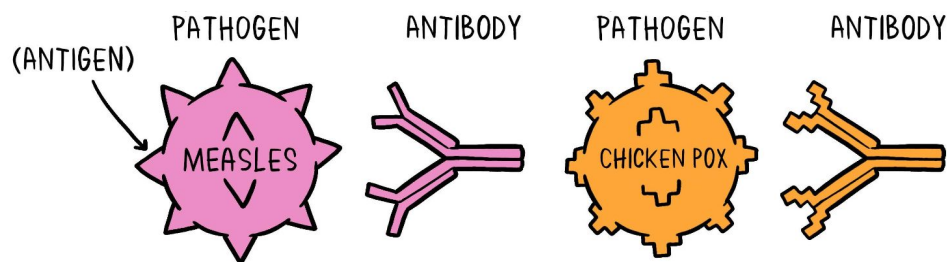
11 Leaf structure



GCSE Infection and Response

1

Antibodies and antigens



Nº	Keyword	Definition
2	Antibiotic	A drug used to kill or prevent the growth of bacteria (e.g. penicillin)
3	Antibody	A protein produced by white blood cells in response to the presence on an antigen
4	Antigen	A molecule on the surface of a cell, with a specific shape
5	Antitoxin	A protein produced by white blood cells which counteracts toxins (poisons) produced by bacteria
6	Clinical trials	Drug tests on human volunteers
7	Communicable disease	A disease that can be spread between individuals
8	Double-blind trial	A clinical trial where neither the doctors nor the patients know who has received the drug and who has received the placebo until after the trial
9	Efficacy	Whether something (e.g. a drug) works or not
10	Immunity	The ability of the white blood cells to respond quickly to a pathogen (so symptoms don't occur)
11	Painkiller	A drug that relieves pain. It does NOT treat the disease.
12	Pathogen	A microorganism that causes disease
13	Phagocytosis	The process by which white blood cells engulf pathogens and digest them.
14	Placebo	A dummy pill. Used in drug trials to test the effect of the real drug.
15	Preclinical trial	Drug tests on human cells and tissues, and animals
16	Vaccination	An injection of dead or inactive pathogens to provide immunity

Nº	Facts
17	Bacteria, fungi, protists and viruses can all be pathogens (cause disease)
18	The skin, hair, mucus and stomach acid are general defenses that prevent pathogens from infecting the body.

Learned

Revised

Confident

____ % Achieved: _____

GCSE Bioenergetics

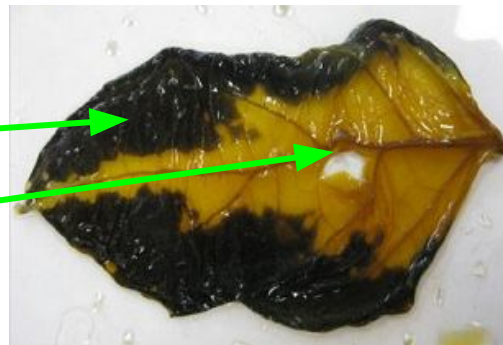
1

Learned Revised Confident

_____ % Achieved: _____

Starch present

No starch present



N ^{ocv}	Keyword	Definition
2	Aerobic	Respiration that involves the use of oxygen to transfer energy.
3	Anaerobic	Respiration that takes place without oxygen to transfer energy.
4	Fermentation	The process of breaking down sugars by anaerobic respiration in bacteria or yeast.
5	Metabolism	The sum of all the reactions in the cell or body. This is controlled by enzymes
6	Oxygen debt	The amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells.
7	Photosynthesis	An endothermic reaction in which energy is transferred from the environment to chloroplasts by light.
8	Respiration	A chemical reaction that breaks down glucose to release energy.

N ^{ocv}	Facts Definition
9	Factors affecting the rate of photosynthesis: Carbon dioxide, Temperature, Light intensity
10	Plants use glucose for: Respiration, Making cellulose, Making amino acids, Converted and stored as lipids (fats), Converted and stored as starch, Stored as sucrose and other sugars in fruits.

11

Aerobic respiration

Glucose + Oxygen → Carbon dioxide + Water + Energy

12

Anaerobic respiration

Glucose → Lactic acid + Energy

13

Fermentation

Glucose → Ethanol + Carbon dioxide + Energy

14

Photosynthesis

Carbon dioxide + Water → Glucose + Oxygen

Chemistry

GCSE Quantitative chemistry

1

RELATIVE FORMULA MASS (M_r)

ADD TOGETHER THE RELATIVE ATOMIC MASSES OF ALL THE ATOMS IN THAT COMPOUND'S MOLECULAR FORMULA

MAGNESIUM CHLORIDE



$$24 + (35.5 \times 2)$$

$$M_r = 95$$



Learned Revised Confident

_____ % Achieved: _____

Nº	Keyword	Definition
2	Relative formula mass	The relative mass of a compound is the total of all the atomic masses added together e.g. $\text{H}_2\text{O} = 1 + 1 + 16 = 18$
3	Percentage mass	This is the percentage of a certain atom within a compound, we can use this to find the mass of that elements in the compound
4	Mole	A unit of measurement in chemistry. One mole is equal to the relative formula mass in grams. One mole contains 6.02×10^{23} of those particles
5	Avogadro constant	6.02×10^{23} - the number of particles (atoms / molecules / ions / electrons) found in one mole of <u>ANY</u> substance
6	Conservation of mass	Atoms are not created or destroyed in chemical reactions, they are rearranged. The total mass of the reactants and products is the same
7	Concentration	The quantity (mass or moles) of a substance in a certain volume of solution. This can be in g/dm^3 or mol/dm^3
8	Atom economy	The percentage of the mass of the reactants that ends up as the desired product
9	Yield	The amount of product made in a reaction

10

CONSERVATION OF MASS

↳ NO ATOMS ARE CREATED OR DESTROYED (ONLY THE BONDS CHANGE)



+



→ COMPLETELY



$$2.3\text{g}$$

$$3.5\text{g}$$

$$5.8\text{g}$$

11

CALCULATE THE PERCENTAGE MASS OF A PARTICULAR ELEMENT IN A COMPOUND

% MASS OF



IN

CALCIUM HYDROXIDE



$$(16 \times 2)$$

$$(40 + (2 \times 16) + (2 \times 1))$$

$$= 43.2\%$$

12

HOW TO CALCULATE THE CONCENTRATION OF A SOLUTION

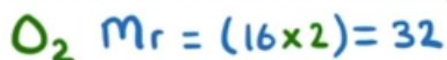
'40g NaOH DISSOLVED IN 2.5 dm³ OF WATER'

$$\frac{40\text{g}}{2.5\text{ dm}^3} = 16\text{ g per dm}^3$$

13

MOLE

UNIT WE USE TO MEASURE THE AMOUNT OF CHEMICAL WE HAVE



$$1 \text{ MOLE} \rightarrow 32\text{g}$$

GCSE Chemical changes

1

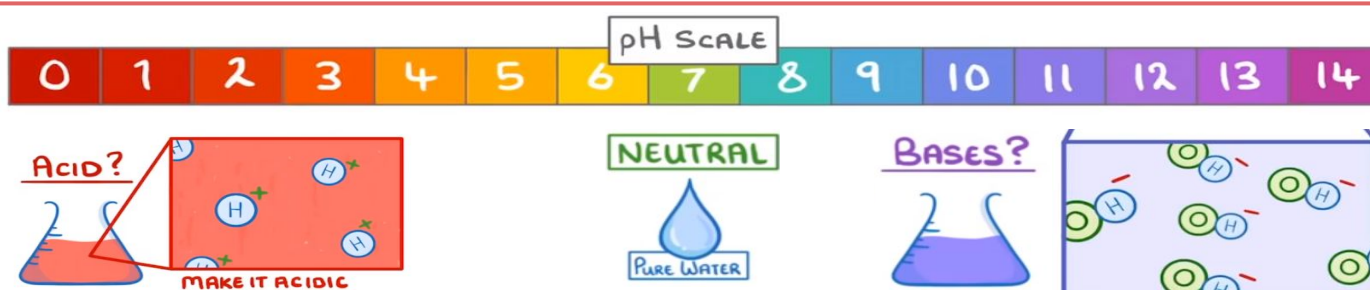
Learned	Revised	Confident
_____ % Achieved:_____		

Acid Formula	Acid Name	Salt Name
HCl	Hydrochloric	Chloride
H ₂ SO ₄	Sulphuric	Sulphate
HNO ₃	Nitric	Nitrate
H ₃ PO ₄	Phosphoric	Phosphate

REACTIVITY SERIES
POTASSIUM
SODIUM
LITHIUM
CALCIUM
MAGNESIUM
CARBON
ZINC
IRON
HYDROGEN
COPPER

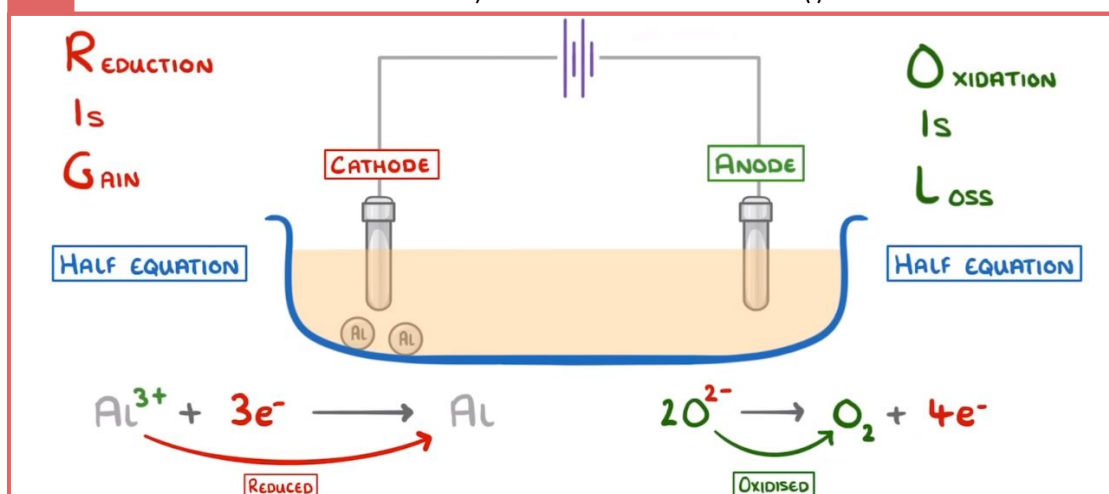
Nº	Keyword	Definition
2	Acid	Substance with a pH less than 7 that forms H ⁺ ions in solution e.g. H ₂ SO ₄
3	Base	A substance that reacts with an acid in a neutralisation reaction e.g. CaO
4	Alkali	Substance with a pH greater than 7 that forms OH ⁻ ions in solution e.g. NaOH
5	Strong acid	Strong acids will fully ionise / dissociate in solution whereas weak acids only partially ionise / dissociate in solution
6	Neutralisation	A reaction between acids and bases where a neutral product i.e. water forms
7	Displacement	A more reactive element will replace a less reactive element from a compound
8	Oxidation	Where oxygen is gained or electrons are lost by a species
9	Reduction	Where oxygen is lost or electrons are gained by a species
10	Electrolysis	Breaking down a substance, usually ionic compounds, using electricity

11



12

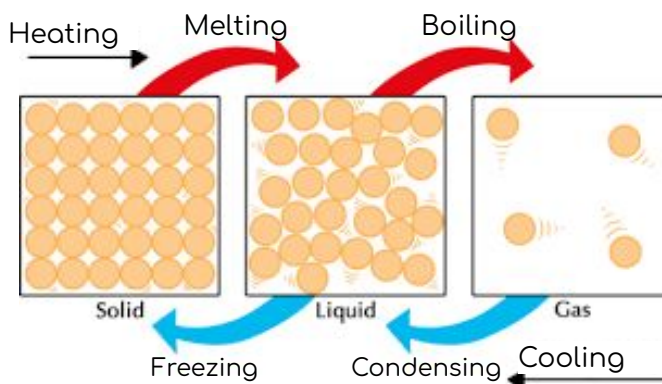
Electrolysis of Aluminium oxide (l)



Physics

GCSE Particle model

1



Nº	Keyword	Definition
2	Density	A measure of the "compactness" of a substance.
3	Evaporating	When particles at the surface of a liquid spontaneously gain enough energy to turn into gas particles - this happens below the boiling point.
4	Internal energy	The total energy that a system's particles have in their kinetic and potential energy stores
5	Pressure	Force per unit area
6	Specific latent heat	Energy required to change the state of 1 kg of a substance without a change in temperature (SLH fusion is for melting/freezing, SLH vaporisation is for boiling/condensing).
7	Sublimation	Change in state from a solid to a gas (without becoming a liquid)

	Solid	Liquid	Gas
8	Regular arrangement (touching)	Irregular arrangement (touching)	Irregular arrangement (not touching)
9	Vibrate in fixed positions	Free to move	Random speeds and random directions
10	Lowest energy	Medium energy	Highest energy
11	Strongest forces	Medium forces	Weakest forces

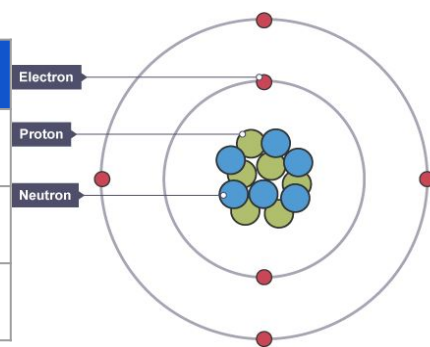
Nº	Facts
12	Substances change state when they have enough energy to overcome the bonds holding the particles together.
13	The temperature of a gas is related to the average energy in the kinetic energy stores of the gas particles.

Nº	Equations to learn
14	density = $\frac{\text{mass}}{\text{volume}}$

GCSE Atomic structure and radiation

Learned	Revised	Confident
_____ % Achieved: _____		

Nº	Particle	Mass	Charge
1	Proton	1	+1
2	Neutron	1	0
3	Electron	1/2000	-1



Nº	Keyword	Definition
4	Activity	The number of nuclei of a sample that decay per second
5	Contamination	Has unwanted radioactive atoms on or in it
6	Half life	The time it takes for the number of nuclei of a radioactive isotope in a sample to half
7	Ion	A charged particle (an atom that has gained/lost electrons)
8	Irradiation	Exposure to radiation
9	Isotope	An element with a different number of neutrons

10

SOLID SPHERE MODEL

JOHN DALTON

1803

PLUM PUDDING MODEL

J.J. THOMSON

1904

NUCLEAR MODEL

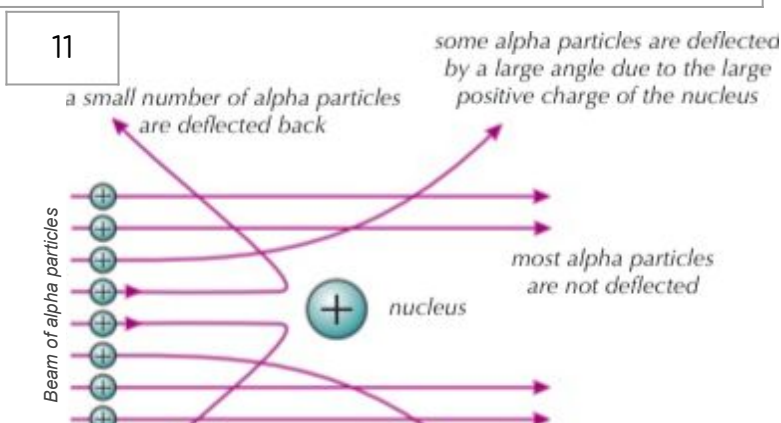
ERNEST RUTHERFORD

1911

PLANETARY MODEL

NIELS BOHR

1913



Nº	Type of radiation	Change in the nucleus	Ionising power	Range in air	Stopped by
12	α alpha particle (two protons and two neutrons)	nucleus loses two protons and two neutrons	highest ionising power	travels a few centimetres in air	stopped by a sheet of paper
13	β beta particle (fast-moving electron)	a neutron changes into a proton and an electron	high ionising power	travels \approx 1 m in air	stopped by a few millimetres of aluminium
14	γ gamma radiation (short-wavelength, high-frequency EM radiation)	some energy is transferred away from the nucleus	low ionising power	virtually unlimited range in air	stopped by several centimetres of thick lead or metres of concrete