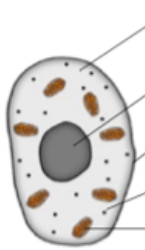
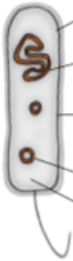
Cell Biology and diffusion L1-7



cytoplasm	*site of chemical reactions in the cell*	gel like substance containing enzymes to catalyse the reactions
nucleus	*contains **genetic material***	controls the activities of the cell and codes fro proteins
cell membrane	*semi permeable*	controls the movement of substances in and out of the cell
ribosome	*site of protein synthesis*	mRNA is translated to an amino acid chain
mitochondrion	*site of respiration*	where energy is released for the cell to function



cell membrane	*site of chemical reactions in the cell*	gel like substance containing enzymes to catalyse the reactions
bacterial DNA	*not in nucleus floats in the cytoplasm*	controls the function of the cell
cell wall	***NOT** made of cellulose*	supports and strengthens the cell
plasmid	*small rings of DNA*	contain additional genes
cytoplasm	*semi permeable*	controls the movement of substances in and out of the cell

Bacterial cells are much smaller than plant and animal cells

animal cell

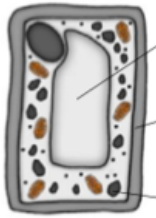
plant cell

Eukaryotes complex organisms

AQA Cell Structure

Prokaryotes simpler organisms

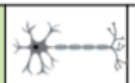
contains all the parts of animal cells plus extras



permanent vacuole	*contains cell sap*	keeps cell turgid, contains sugars and salts in solution
cell wall	*made of cellulose*	supports and strengthens the cell
chloroplast	*site of photosynthesis*	contains chlorophyll, absorbs light energy

Specialised cells

specialised animal cells

nerve		*carry electrical signals*	long branched connections and insulating sheath
sperm		*fertilise an egg*	streamlined with a long tail acrosome containing enzymes large number of mitochondria
muscle		*contract to allow movement*	contains a large number of mitochondria long

specialised plant cells

root hair		*absorb water and minerals from soil*	hair like projections to increase the surface area
xylem		*carry water and minerals*	TRANSPIRATION - dead cells cell walls toughened by lignin flows in one direction
phloem		*carry glucose*	TRANSLOCATION - living cells cells have end plates with holes flows in both directions

Cell differentiation

how a cell changes and becomes **specialised** **Undifferentiated** call are called **STEM** cells

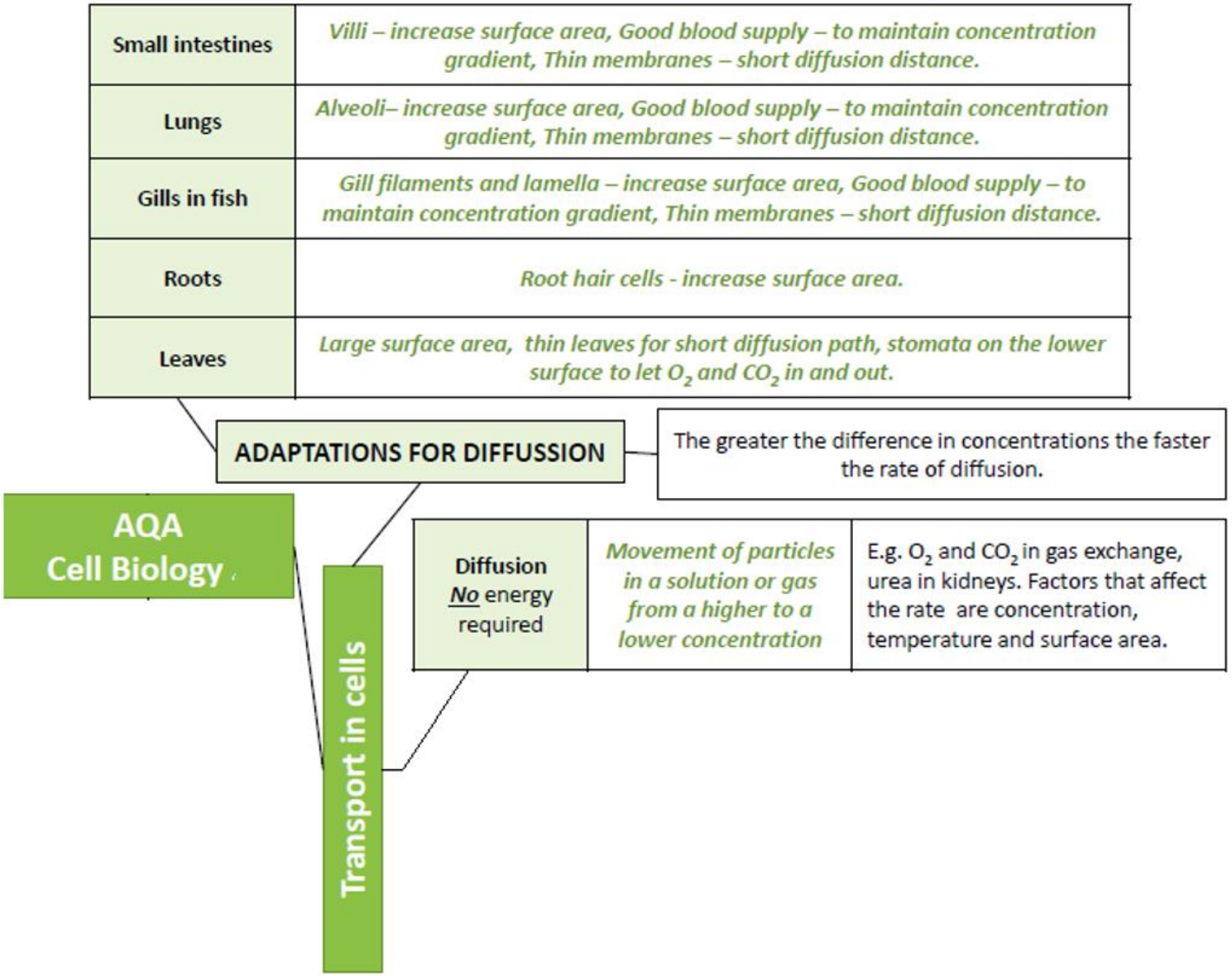
animal cell differentiation

early stages of development only for repair and replacement

plant cell differentiation

all stages of life cycle the stem cells are grouped together in meristems

Cell Biology and diffusion L1-7



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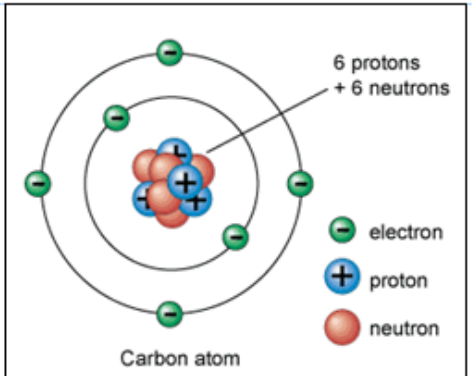
Atomic Structure Knowledge Organiser



Carbon atom

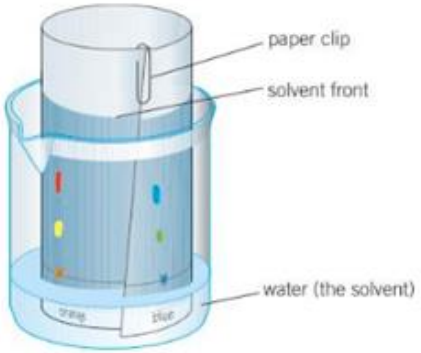
Name	Charge	Mass
Proton	+1	1
Neutron	0	1
Electron	-1	1/1840

Year	History of the Atom
1800s	John Dalton came up with the idea of the atom—tiny, hard spheres.
1800s	J.J. Thomson discovered the electron and theorised the Plum Pudding model.
1900s	Geiger and Marsden completed the gold-foil experiment and discovered the nucleus.
1914	Niels Bohr came up wit h the idea of energy levels.
1932	James Chadwick discovered the neutron.

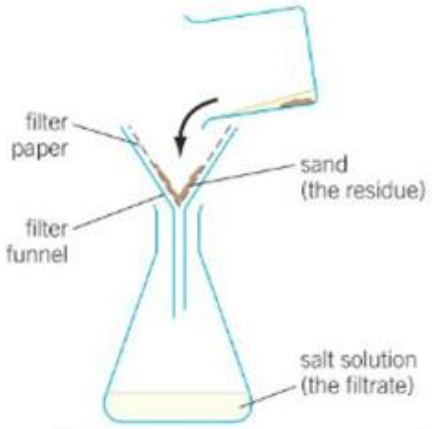
Keyword	Definition	Keyword	Definition
1. Atoms	The smallest part of an element that can still be recognised as that element.	13. Reactant	The substances you start a reaction with
2. Element	A substance made up from only one type of atom. An element cannot be broken down chemically into any simpler substance.	14. Product	The substances made from the reaction
3. Compound	A substance made when two or more elements are chemically bonded together.	15. Symbol Equation	An equation that uses the symbols for elements found in the periodic table.
4. Mixture	When some elements or compounds are mixed together and intermingle but do not react together (i.e. no new substance is made)	16. Word Equation	An equation that uses words to name the substances found in the reaction.
5. Periodic Table	An arrangement of elements in the order of their atomic numbers, forming groups and periods.	17. Law of the conversation of mass	The total mass of the products formed in the reaction is equal to the total mass of the reactants.
6. Group	A column of the periodic table.	18. State symbol	Added to a reactant or product to tell you whether or not a substance is solid (s), liquid, (l), gas, (g) or aqueous (aq)
7. Period	A row of the periodic table.	19. Atomic Number	The amount of protons found in the nucleus for that particular element.
8. Nucleus	The very small and dense central part of an atom that contains protons and neutrons.	20. Ion	When an electron is either gained or lost from an atom
9. Electron	A tiny particle with a negative charge. Electrons orbit the nucleus of atoms or ions in shells. It has a negligible mass.	21. Isotope	When the number of electrons and protons for an element is the same but the neutrons have changed
10. Proton	A tiny positive particle found inside the nucleus. It has a mass of one.	22. Shell	Electrons are arranged around the nucleus, going up in energy per shell.
11. Neutron	A dense particle found in the nucleus of an atom. It is electrically neutral, carrying no charge.	23. Electronic Structure	The arrangement of electrons around the nucleus. There are 2 electrons in the first shell, and 8 in every shell after that.
12. Molecule	A grouping of two or more atoms bonded together.	24. Noble Gas	Gases that always have a full outer shell of electrons.

Year 9 – Science / Atomic Structure– HT1

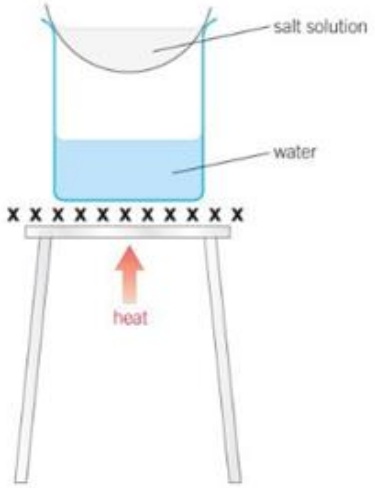
Atomic Structure Knowledge Organiser



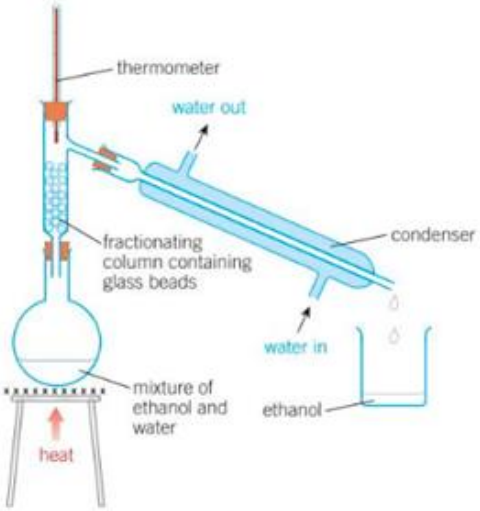
Chromatography



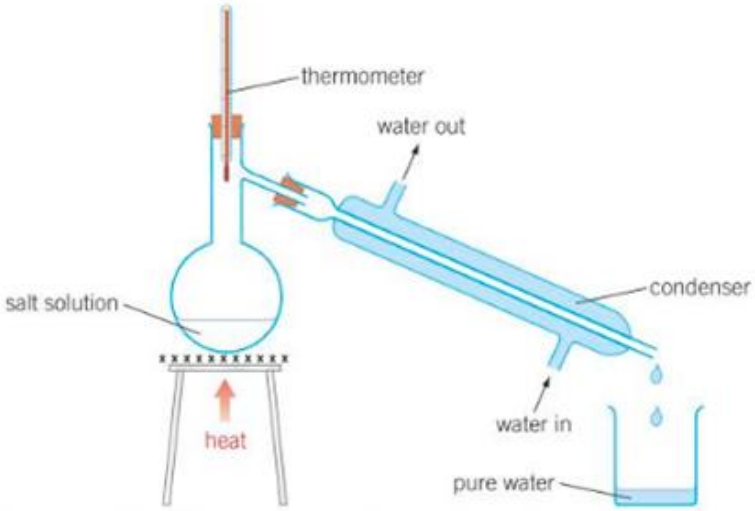
Filtration



Crystallisation



Fractional Distillation



Distillation

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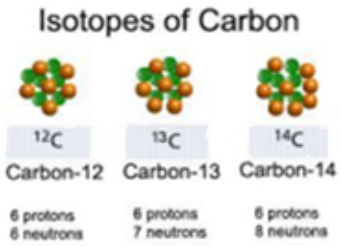
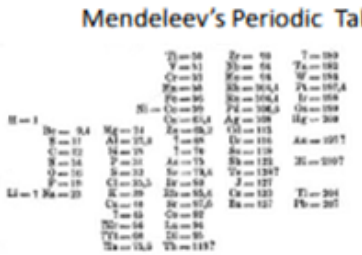
The Periodic Table knowledge Organiser

The History Of The Periodic Table

- Throughout history scientists have tried to classify substances and many scientists attempted to construct a Periodic table.
- Before the knowledge of proton , neutrons and electrons, scientists arranged the periodic table by **atomic weight** . This meant the groups were not always correct.
- In 1869 Dimitri **Mendeleev**, a Russian scientist, published his Periodic Table. It was slightly different to those that had been before. He still arranged elements by atomic weight but he also left gaps for where he predicted elements would be.
- He very accurately predicted the properties of elements that were not discovered until many years later; for example Gallium.
- Mendeleev's Periodic table is still different from the modern one as some of his masses were wrongdue to the existence of **isotopes**.
- Isotopes are elements with the same number of protons and electrons but a different number of neutrons and therefore different atomic weight.

Key Terms	Definitions
Dimitri Mendeleev	A Russian chemist, who in 1869 published a Periodic Table con-
Periodic Table	The Table which organises the 118 elements based on atomic
Isotope	Two atoms with the same number of protons and electrons but
Metal	An element which loses electrons to form a positive charge.
Non Metal	An element which gains electrons to form a negative charge.
Ion	An element with a positive or negative charge





The transition metals, in the central block of the periodic table are :

- good conductors of heat and electricity.
- can be bent or hammered into shape.
- copper is used in plumbing because it is resistant to corrosion (will not react with the water in the pipes) and electrical wiring because it is a good conductor of heat and electricity.

Aluminium and titanium are useful metals because they have a low density and are resistant to corrosion.

Groups in the Periodic Table

	Physical Properties	Chemical Properties	Equation	Trends / Explanation
Group 1 (Alkali Metals)	Soft, low density	React vigorously with water releasing hydrogen.	Sodium + water → sodium hydroxide + hydrogen	More reactive as you go down. Outermost electron further from the nucleus so it's easy to lose.
Group 7 (Halogens)	Low melting point, exist as a pair(Cl_2)	React with group 1 metals to form compounds. Can carry out displacement reactions.	Sodium + chlorine → sodium chloride Sodium bromide + chlorine → sodium chloride + bromine	Higher melting popint as you go down the group (higher molecular mass). Less reactive as you go down the group.
Group 0 (Nobel Gasses)	Low melting / boiling point. Eight electrons in outer shell (except helium)	Unreactive, as they have a full outer shell	N/A	Higher melting point and boiling point as you go down the gfroup (due to increase in density).

Year 9 – Science / Periodic Table – HT1