

Prior Knowledge: From KS2 you should know that materials change state when heated and cooled. Solids, liquids and gases to decide how mixtures can be separated (filtering, sieving and evaporating)

Pure Substance

Definition: A pure substance contains only one type of particle.

For example

Pure iron contains only iron particles (called iron atoms);

Pure water contains only water particles (called water molecules);

Mixtures:

Definition: A mixture contains **more than one** type of particle that are not chemically joined together.

For example:

Air contains 21% oxygen,

78% nitrogen and

1% of other gases (eg argon and carbon dioxide).



Conservation of mass

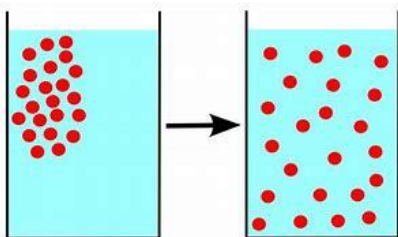
Mass of all reactants = mass of all products

For example, 10 g of water boils to form 10 g of steam, or freezes to form 10 g of ice

Diffusion

Definition: Diffusion is the passive movement of a substance from an area of **high** concentration to an area of **low** concentration.

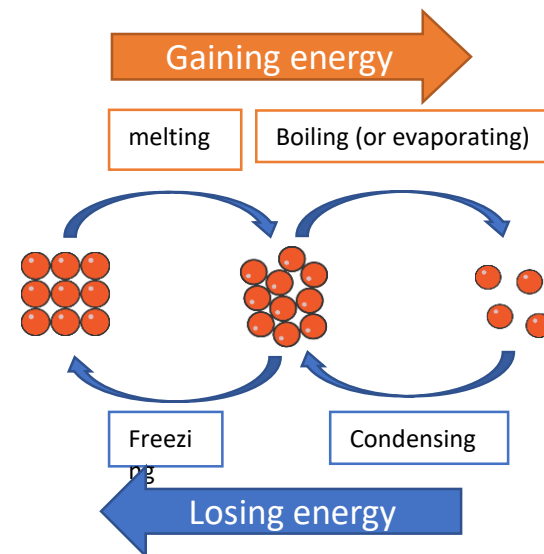
Explanation: Diffusion happens in fluids (liquids and gases) because their particles move randomly from place to place.



Arrangement of Particles

State	Solid	Liquid	Gas
Diagram			
Arrangement of particles	Regular arrangement	Randomly arranged	Randomly arranged
Movement of particles	Vibrate about a fixed position	Move around each other	Move quickly in all directions
Closeness of particles	Very close	Close	Far apart

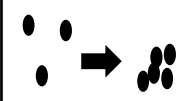

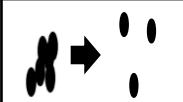


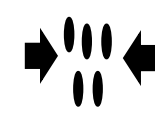
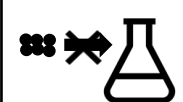
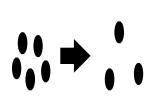
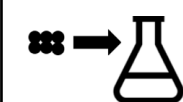

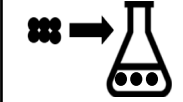



Changes of State



Science (Chemistry) – 7CP Particles

Linked to 8CP unit in Year 8

Prior Knowledge: From KS2 you should know that materials change state when heated and cooled. Solids, liquids and gases to decide how mixtures can be separated (filtering, sieving and evaporating)

Keyword (Old linked)	Definition		Keyword (New)	Definition	
Condense	When gases cool enough to turn back into a liquid		Anomalies	Results that do not fit into the overall trend	
Evaporate	When particles gain enough energy to turn from a liquid to a gas		Chromatography	A method of separating more than one solute from a solution – e.g, colours in food dyes	
Filtering	Method of separating insoluble particles from a liquid		Compress	To squash into a smaller space	
Insoluble	A solid that will not dissolve in a solvent		Diffusion	The spreading out of particles from an area of high concentration to an area of lower concentration	
Soluble	A solid that will dissolve in a solvent		Distillation	Method of separation involving evaporating and then condensing	
Solute	A substance that has dissolved in a solution		Reproducible	Results or conclusions that are the same as other groups'	
Solvent	The liquid into which something will dissolve		Saturated	When no more solute will dissolve in a solution	

1		2												3	4	5	6	7	0						
														1 H hydrogen 1											4 He helium 2
														Key relative atomic mass atomic symbol name atomic (proton) number											
7 Li lithium 3		9 Be beryllium 4												11 B boron 5		12 C carbon 6		14 N nitrogen 7		16 O oxygen 8		19 F fluorine 9		20 Ne neon 10	
23 Na sodium 11		24 Mg magnesium 12												27 Al aluminium 13		28 Si silicon 14		31 P phosphorus 15		32 S sulfur 16		35.5 Cl chlorine 17		40 Ar argon 18	
39 K potassium 19		40 Ca calcium 20		45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36						
85 Rb rubidium 37		88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54							
133 Cs caesium 55		137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86							
[223] Fr francium 87		[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	[285] Cn copernicium 112	[286] Uut ununtrium 113	[289] Fl flerovium 114	[289] Uup ununpentium 115	[293] Lv livermorium 116	[294] Uus ununseptium 117	[294] Uuo ununoctium 118							

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

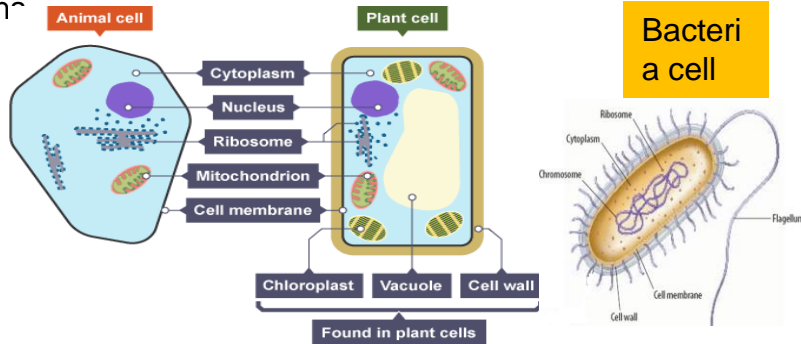
Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

Prior Knowledge: KS2 knowledge: Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves & flowers.

Cells:

Definition; **Unicellular** organisms are made of one cell (eg bacteria)

Multicellular organisms are made of many cells (eg plants and human)



Specialised Cells

These are some examples of specialised cells; cells that are adapted to do a specific job.

Sperm cell

Streamlined – swim fast

Lots of mitochondria that release energy for swimming



Palisade cell

Lots of chloroplasts that absorb sunlight for photosynthesis



Root hair cell

Large surface area to absorb water and minerals more efficiently

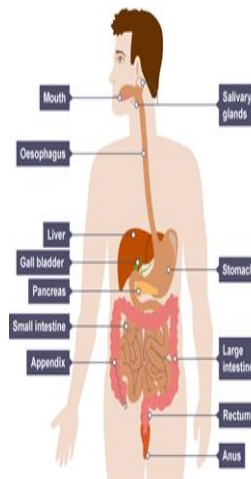
Large vacuole for storing cell sap

Digestive system

Role: to break down large food molecules into smaller molecules that can be absorbed

Adaptations

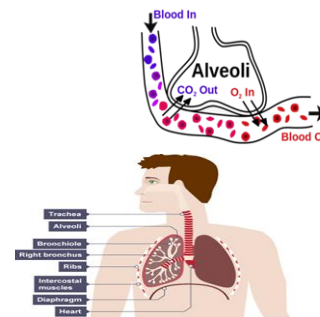
- The intestine is a highly folded structure, which increases surface area which speeds up diffusion
- The intestine is covered in many villi which are further covered by microvilli = large surface area → faster rate of diffusion
- Thin membranes → shorter distance to diffuse → faster rate of diffusion
- Covered in blood vessels → keeps blood moving to maintain concentration differences → faster rate of diffusion



Cell → Tissue → Organ → Organ system

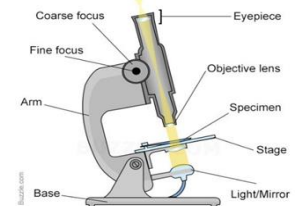
Respiratory system

Role: to take in oxygen for respiration and remove carbon dioxide






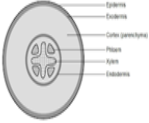

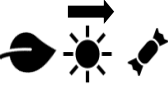

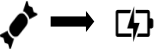

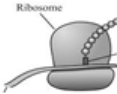

Using a microscope

Put the slide on the stage
Always start on the lowest magnification
Use the focus to see your object, then increase the magnification



Science (Biology) – 7BC Cells

Linked to 7BR unit in Year 7

Keyword	Definition		Keyword	Definition	
Alveoli	Tiny air sacs in the lungs where oxygen and carbon dioxide diffuse into and out of the blood		Nucleus	Controls activities of the cell, where the genetic information is found	
Chloroplast	Where photosynthesis takes place in plant cells		Phloem	Plant tissue that carries dissolved sugars from the leaves around the plant	
Cytoplasm	Where the cell's chemical reactions take place		Photosynthesis	The chemical reaction in which plants use carbon dioxide and water to make glucose and oxygen using energy	
Diffusion	The random movement of particles from a high concentration to a low concentration across the cell membrane		Respiration	Takes place in all living cells. Glucose broken down to release energy	
Digestion	Breaking down large food molecules into smaller molecules that can be absorbed		Ribosomes	Where proteins are made in a cell	
Microscope	The instrument we use to make things appear bigger so that we can see them		Tissue	The structure formed when cells with the same type work together	