

Year 8 Science Exam Revision Notes

You should turn these notes in to your own resources as part of your revision.

Try making cue cards or a mind map.

Biology

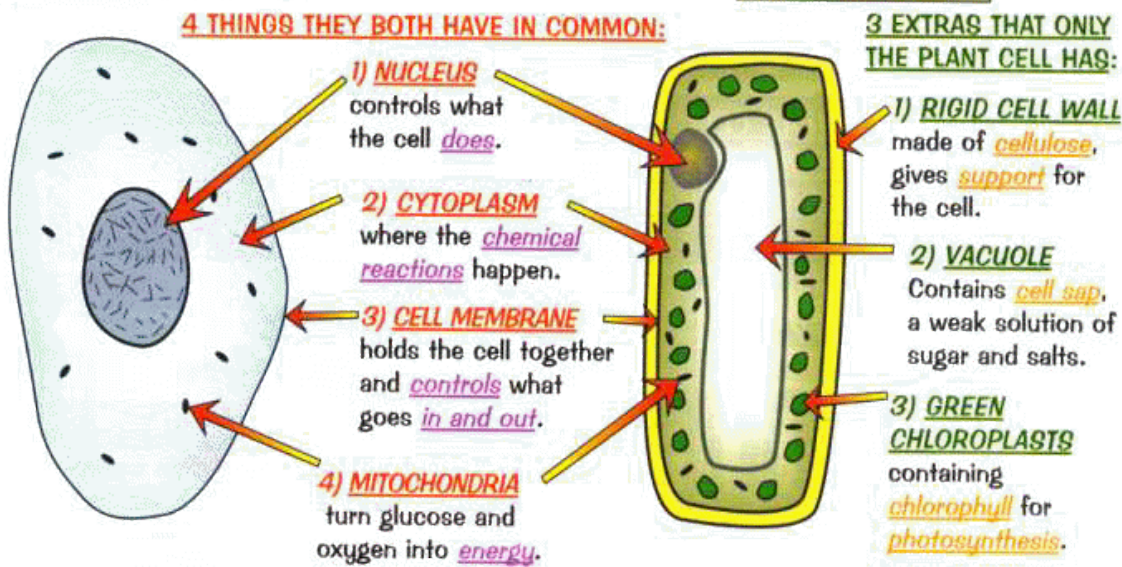
Cell Structure

Plant Cells and Animal Cells Have Their Differences

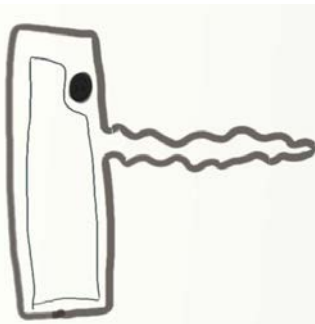
You need to be able to draw these two cells WITH ALL THE DETAILS for each.

Animal Cell

Plant Cell



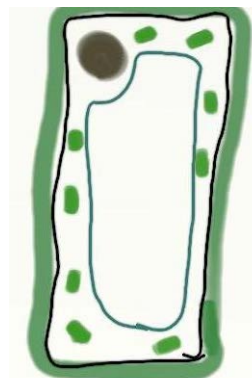
Specialised Cells:



Root hair cell

Large surface area (long and thin), absorb lots of water & minerals

No chloroplasts (underground, no light, no photosynthesis)



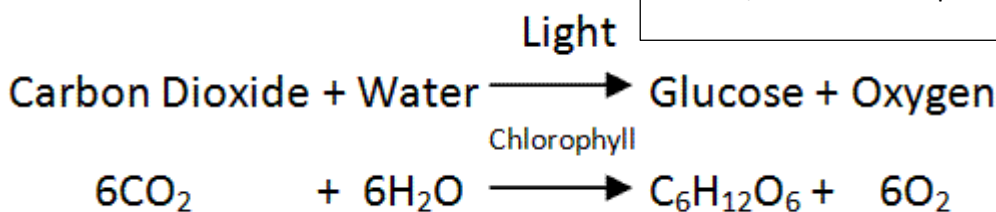
Palisade cell (in leaf)

Vacuole- filled with sap, support cell

Lots of chloroplasts for photosynthesis

Photosynthesis

To increase photosynthesis: increase light levels, carbon dioxide, water and temperature (but not too hot!).



Glucose (sugar) is a source of energy, also converted in to carbohydrate (starch).

Starch test: orange iodine turns blue/ black.

Respiration



glucose + oxygen \longrightarrow water + carbon dioxide + energy

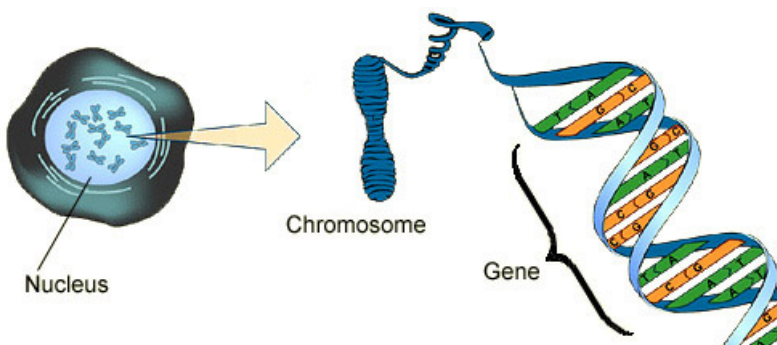
When exercising:

Cells require more glucose & oxygen to be able to carry out more respiration & release more energy.

Cells produce more waste products (carbon dioxide & water) which need to be removed more quickly.

Heart pumps faster to move blood round body more quickly and therefore deliver oxygen & glucose more quickly and remove carbon dioxide & water more quickly.

Genetics



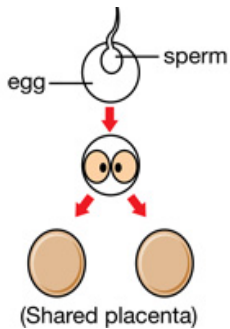
Some factors are inherited (eye colour, hair colour)

Some factors are acquired (language spoken)

Some factors are affected by both (body mass)

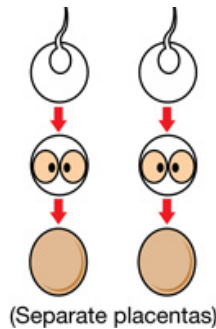
Twins:

Identical twins



One egg, one sperm, splits

Non-identical twins



Two eggs, two sperm.

Reproduction:

Sexual reproduction- produces variation in offspring by combining genes from two gametes (egg and sperm in humans) from two parents.

Asexual reproduction- produces clones with same chromosomes as parent.


Evolution

1. There is variation within a population.
2. Some individuals are more suited to their environment.
3. They survive
4. They reproduce, and pass on the successful characteristics in their genes

Reasons for extinction:

Environment change, new predators, new diseases, new competitors, single catastrophic event (e.g. meteor).

Reactivity:



| |
|-----------|
| Potassium |
| Sodium |
| Lithium |
| Calcium |
| Magnesium |
| Aluminium |
| Carbon |
| Zinc |
| Iron |
| Hydrogen |
| Copper |
| Silver |
| Gold |

More reactive metals can displace less reactive metals

e.g. magnesium oxide + sodium \rightarrow sodium oxide + magnesium

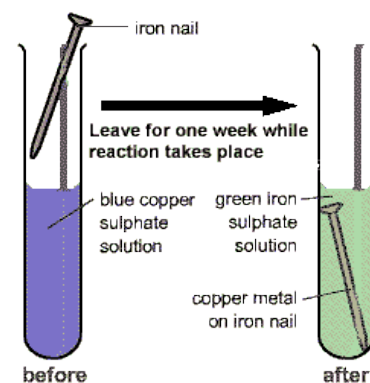
e.g. magnesium oxide + zinc \rightarrow no reaction

e.g. iron + copper sulfate \rightarrow

iron sulfate + copper

Carbon can also be used in displacement reactions (blast furnace):

iron oxide (from iron ore) + carbon (from coke) \rightarrow iron + carbon dioxide



Reactions with water:

Group 1 metal + water \rightarrow metal hydroxide (alkali) + hydrogen e.g. lithium + water \rightarrow lithium hydroxide + hydrogen

Metal oxide + water \rightarrow metal hydroxide (alkali) e.g. magnesium oxide + water \rightarrow magnesium hydroxide

Non-metal oxide + water \rightarrow acid e.g. sulphur dioxide + water \rightarrow sulphuric acid

Reactions producing water:

Metal carbonate + acid \rightarrow salt + carbon dioxide + water effervesce (fizz) due to gas produced

pH scale & testing with Universal Indicator:

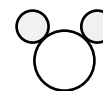
| | | | | | | | | | | | | | | |
|---------|-------------|---|---|---|---|---|---------|---|---|---------------|----|----|----|------|
| Colour: | red | | | | | | green | | | | | | | blue |
| pH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | Strong acid | | | | | | Neutral | | | Strong alkali | | | | |

Definitions

Atom: individual piece of matter e.g. argon, Ar



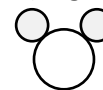
Molecule: two or more atoms bonded together. (Can be same or different types) e.g. water, H₂O



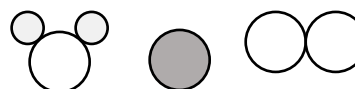
Element: only one type of atom (a pure substance) (can be individual atoms or molecules) e.g. oxygen, O₂



Compound: two or more different types of atom chemically bonded e.g. water, H₂O.



Mixture: two or more different types of atom/ molecule not chemically bonded e.g. air



Types of Reaction

In a chemical reaction first bonds are broken and then new bonds are made.

Exothermic: reaction gives out more heat energy than it takes in.

Endothermic: reaction takes in more heat energy than it gives out.

Physics

Weight & Gravity

Mass: amount of matter in an object. Measured in kg.

Weight: force of gravity acting on the mass. Measured in N.

Gravitational field strength: how strong gravity is on a planet. Measured in N/kg or m/s^2 .

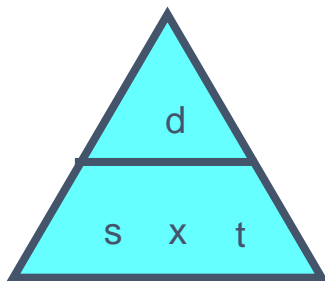
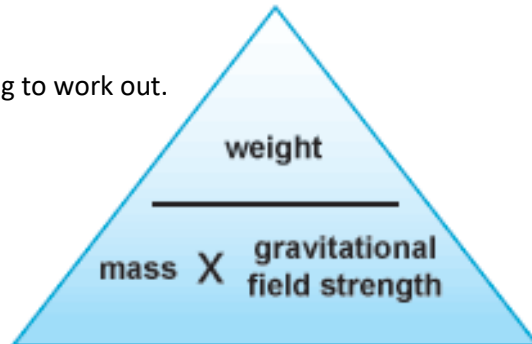
To use a formula triangle, cover over the part you are trying to work out.

This will leave with either:

Mass = weight / gravitational field strength

Weight = mass x gravitational field strength

Gravitational field strength = weight / mass



Speed

Speed (m/s) = distance (m) / time (s)

Distance (m) = speed (m/s) x time (s)

Time (s) = distance (m) / speed (m/s)

The Solar System

Orbits:

Day: time taken for Earth to spin once on its axis (24 hours)

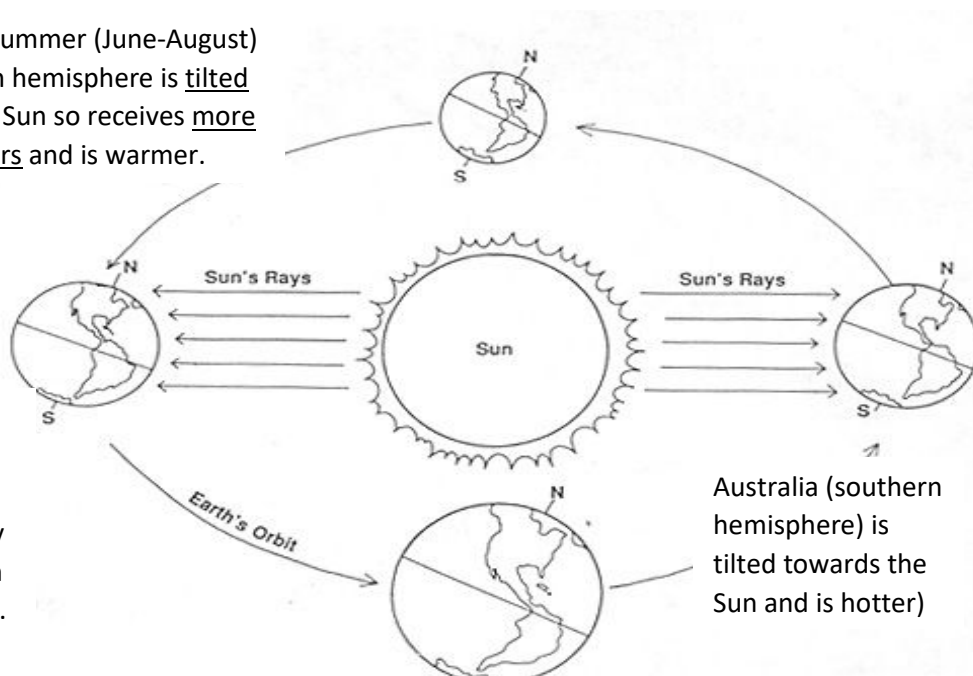
Year: time taken for Earth to orbit the Sun once (365 days)

Seasons:

Earth's axis is tilted at 23.5° so amount of sunlight hitting each hemisphere depends on whether the hemisphere is tilted towards the Sun at that time of year.

During our Summer (June-August) the northern hemisphere is tilted towards the Sun so receives more daylight hours and is warmer.

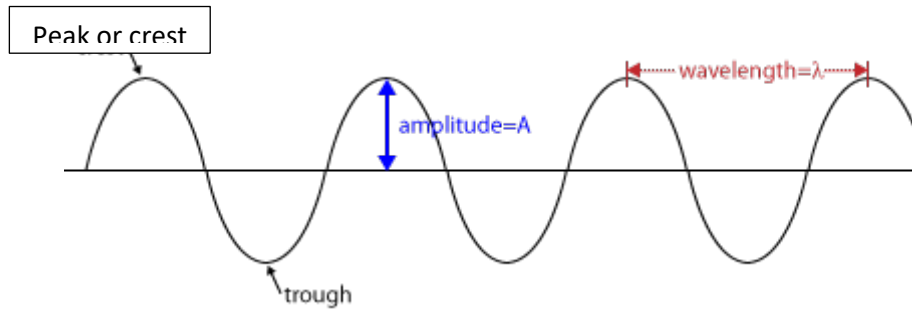
Australia (southern hemisphere) is tilted away from the Sun and is cooler.



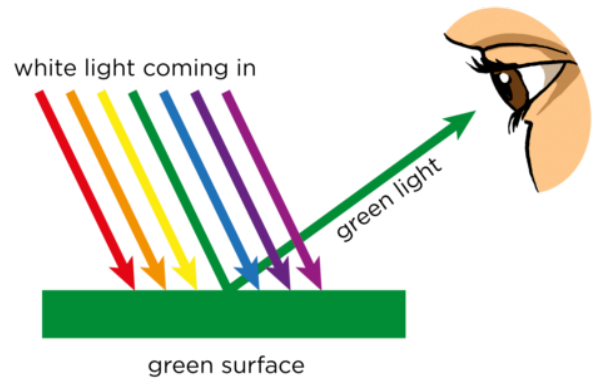
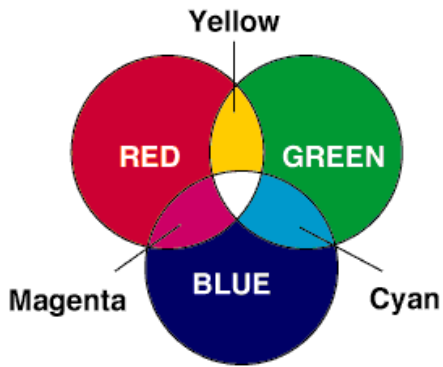
Australia (southern hemisphere) is tilted towards the Sun and is hotter

During our Winter (December-February) the northern hemisphere is tilted away from the Sun so receives less direct sunlight and is colder.

Waves



Colour



Three primary colours of light: red, green & blue

Red + green = yellow

Green + blue = cyan

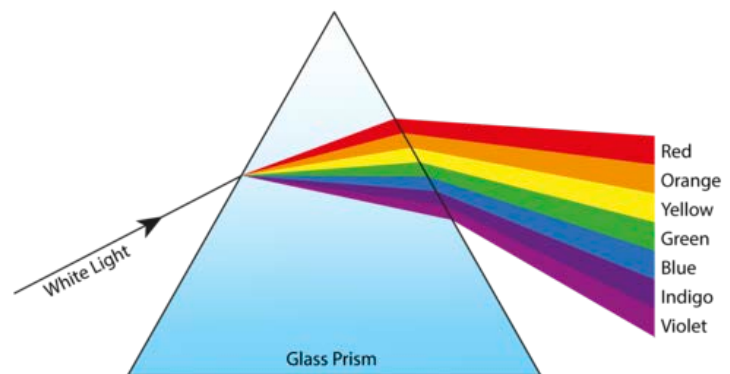
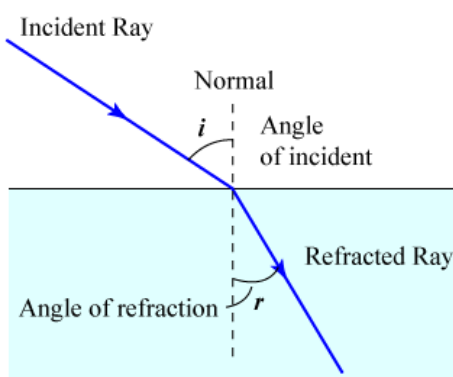
Blue + red = magenta

A surface reflects its own colour & absorbs the others.

A secondary colour absorbs both its primary colours and reflects the others.

Refraction

Refraction is the change in direction of a wave due to entering a medium (material) of a different density.

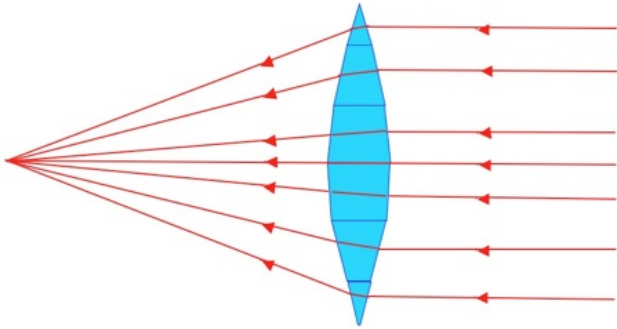


If the medium is higher density the wave will bend towards the normal.

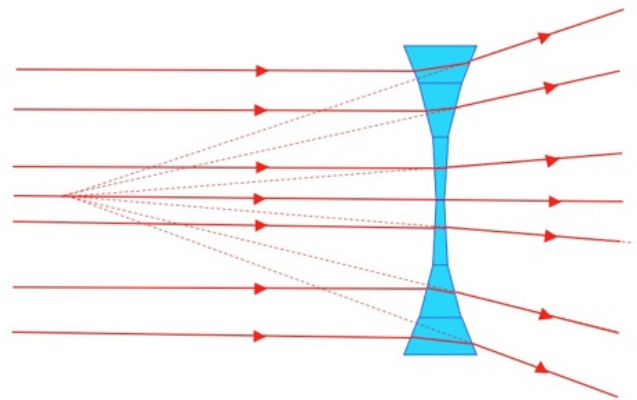
A prism refracts white light and splits it into its component colours.

Lenses

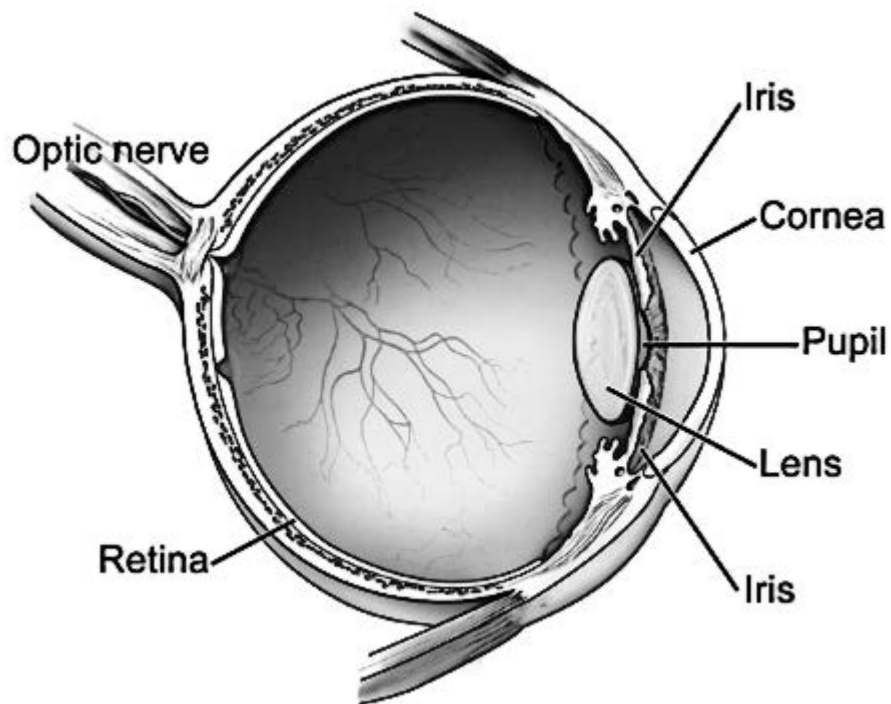
Converging lens



Diverging lens



The Human Eye



Cornea: Refracts light.

Iris: Coloured part made of muscle – controls amount of light going into the eye.

Lens: Focuses light on the retina.

Pupil: Light enters the eye here. Made bigger or smaller by the iris.

Optic nerve: Carries electrical impulses to the brain.

Retina: Contains cells which are light sensitive.