Year 9 Autumn Term 1:

Atomic Chemistry and The Periodic Table



GLOSSARY: Atomic Chemistry and Periodic Table:

- <u>CHEMICAL SYMBOL</u>: The letters on the periodic table that give the name of each element. Every element has its own chemical symbol.
- <u>NUCLEUS</u>: The centre part of an atom that contains the protons and neutrons.
- <u>PROTON</u>: Sub-atomic particle that makes up the nucleus of an atom. Has a mass of 1 a.m.u. and a charge of +1.
- <u>NEUTRON</u>: Sub-atomic particle that makes up the nucleus of an atom. Has a mass of 1 a.m.u. and a charge of 0.
- <u>ELECTRON</u>: Sub-atomic particle found orbiting the nucleus in an electron shell. Has a mass of almost 0 and a charge of -1.

<u>ELECTRONIC STRUCTURE</u>: A diagram showing how the electrons are arranged in the electron shells. The 1st shell can have a maximum of 2 electrons, the others can hold up to 8 electrons.

<u>GROUP</u>: The columns of the periodic table represent different groups of elements. Elements with similar properties are in the same

group

<u>ISOTOPE</u>: Atoms of the same element with the same number of protons but a different number of neutrons.

<u>PERIODIC TABLE</u>: Table of elements arranged in order of atomic number and such that elements with similar properties are in the same column (group).

 $C + 2Cl_2 \rightarrow CCl_4$

C CI CI

CI C CI

CI

Periodic Table of the Elements H Hydrogen 1.01 Li Lithium 6.94 Os - 199 Hg - 200 Na Sodium 22.99 -112 Au - 197 ? Dr - 116 8n - 118 Bi - 210? Gemania Sb - 122 Ni Cu Zn Galium Te - 128 J == 127 48 Cd Gdmium 112.41 ້ Sn 47 Ag Silver 107.87 Pd Paladium 106.42 Sb Antimony Ru Authenium Ce - 133 TI - 204 Pb - 207 79 Au 698 196.97 BO Hg Mercury 200.59 Os 0:mium 190.23 Platinum 195.08 81 TI Thalium 204.38 Di - 95 ¹⁰⁸ Hs ¹¹⁰Ds ''Rg ¹¹²Cn °ืÂf Ňh Ög Th -- 118? Eu Empiun 151.96 Gd Gadolinium 157.25 Tb Dy Tertiun 158.93 162.50 ۰ Êm Ňp Md Electron Metalloid Konmetal Halogen Noble Gas + Proton Neutron **Carbon Atom**

Dmitri Mendeleev was a Russian Scientist responsible for the first, modern Periodic Table – in 1869! He studied at St. Petersburg University



Year 9 Autumn 2 : Force and Motion

Glossary

Force - A force is a push or a pull that acts on an object due to the interaction with another object.

Resultant Force - The overall force acting on an object

Newton - The unit of force. One newton is the force needed to accelerate 1kg by $1m/s^2$

Balanced – If the forces on an object are balanced, there is no resultant force.

Unbalanced – If the forces on an object are unbalanced then there is a resultant force acting on the object.

Instantaneous Speed – The speed of an object at the very instant of being measured

Average Speed – the speed of an object measured over the whole journey

Velocity – Speed in a particular direction > Measure in Metres per second (m/s)

Terminal Velocity – When an object reaches terminal velocity it will move at a steady speed in a constant direction because the resultant force is 0.

Mass – A measure of how much matter there is in an object, measured in Kilograms (Kg).

Weight – A force due to the pull of gravity. Measured in Newtons (N).

Density-Mass per unit volume of an object. Measured in Kg m $^{\text{-}3}$

Pressure - A measure of how much force is acting on an area. Measured in Pascals (Pa)

Resultant Forces

This object will either remain at rest, or continue to travel in the same direction at the same speed as there is no resultant



Speed (m/s) = Distance (m)	
Time (s)	

Distance Time Graph



Velocity Time Graph



Terminal Velocity

As the velocity of a falling object increases due to weight, the air resistance increases. Eventually the drag becomes equal to the weight of the object, and it's velocity does not increase anymore.



Weight

Weight (N) = mass (kg) x gravity (N/kg)

<u>Density</u>

Density (kg/m³) = mass(kg) Volume (m³)

<u>Pressure</u>

Pressure (Pa) = force (N) area(m2)



Pressure in Gases

Gas pressure is caused when gas particles hit the walls of their container. The more often the particles hit the walls, and the faster they are moving when they do this, the higher the pressure.



Pressure in Liquids

The pressure in a liquid is different at different depths. Pressure increases as the depth increases. The pressure in a liquid is due to the weight of the column of water above. Since the particles in a liquid are tightly packed, this pressure acts in all directions.

For more information on forces and motior follow this link



Year 9 Spring Term Healthy Lifestyle

Space



Key Words:

Star: A star is a huge, bright ball of burning gas that is held together by

gravity.

Orbit: The curved path around a star or planet

Galaxy: A large group of stars, dust, gas and dark matter held together by gravity.

Gravity: A force that pulls things that have mass together.

Hemisphere's of Earth: North and South of our planet, either side of the equator.

Key Points

- content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed
- calculations of energy requirements in a healthy daily diet
- the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases
- the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)



Key Points

Key Words:

Digestion:

Treating food to

promote

decomposition.

Obesity: Being

overweight

with excess

body fat.

Biomechanics:

Relating to the

movementor

structure of living

organisms.

Enzymes:

substance

produced by a

living organism which acts as a

catalyst

- the structure and functions of the human skeleton, to include support, protection, movement and making blood cells
- biomechanics the interaction between skeleton and muscles, including the measurement of force exerted by different muscles



Key Points

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- gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)
- our Sun as a star, other stars in our galaxy, other galaxies
- the seasons and the Earth's tilt, day length at different times of year, in different hemispheres
- the light year as a unit of astronomical distance



Year 9 Summer Term : Cellular processes and Separation techniques



Microscope – makes objects look bigger by making an enlarged image of them.

Specialised cells – cells which have special features to perform particular functions.

Glossary

Enzyme– a protein produced by living organisms that acts as a catalyst.

Diffusion – spreading of particles from regions of high to regions of low concentration.

Osmosis – movement of water molecules across a partially permeable membrane, from a dilute solution to a more concentrated one.

Active transport- movement of particles across a cell membrane, usually from low to high concentration, against a concentration gradient. This requires energy.

States of matter – one of 3 different forms a substance can have: solid, liquid or gas.

Mixture – a substance containing 2 or more different substances that are not joined together.

Filtration – using a filter to separate insoluble substances from a liquid. E.g sand and water.

Crystallisation– separating the solute from the solution by evaporating the solvent. E.g. salt and water.

Chromatography– a technique used for separating the components of a mixture. E.g. inks.

Distillation – separating a liquid from a mixture by evaporating the liquid and then condensing it so it can be collected. E.g. ink and water.

