**Lesson 1(Atomic structure)**

Characteristic of atoms:

-An atom is the smallest unit of an element, having the properties of that element

-Atoms are made up of smaller particles known as subatomic particles

Subatomic Particle:

-These subatomic particles comprise of (a) proton (positively charged) (b) neutron (neutral - no charge) (c) electron (negatively charged)

Counting Subatomic Particles:

-Proton Number

-Nucleon Number

Where to find the proton number and nucleon number of an element:



The Atomic Mode:

-The centre of an atom is called the nucleus which contains the protons and neutrons.

-The electrons in an atom are arranged in shells (orbits) at different distances from the nucleus. The shell nearest to the nucleus is numbered 1, the second nearest is numbered 2 and so on.

-Each shell can hold a certain maximum number of electrons

How to differentiate the atoms of one element from the atoms of another element:

-All atoms of the same element have the same number of protons while those of different elements contain different number of protons.

Isotopes:

-Isotopes are atoms of the same element with different numbers of neutrons.

How are electrons being arranged in atoms:

-Electronic Structure & Electronic Configuration

-Valence Shell (Outer Shell)

Formation of Ion:

-Formation of cations

-Formation of anions

Reflection:

This is the topic where everything is fun! Firstly, this topic is rather easy with actually nothing much to memorize. I just need to memorize some simple standard concepts before I am able to fully master this topic. Also, it is rather easy to just do some counting before coming up with the answers. The only troublesome thing about this topic is most probably just that when I have to draw the valence electrons and other things, I will have to be very neat and tidy which is very tiring. Other than that, I feel that I have no problem at all with this topic…really hope other topics are as easy as this one. Kicking start the semester with this topic is not a bad idea actually.

**Lesson 2(Periodic Table):**

The Periodic Table:



Group in Periodic Table:

|  |  |
| --- | --- |
| Group number | Group |
| I | Alkali metals |
| II | Alkaline earth metals |
| VII | Halogens |
| 0 | Noble gases |

Period in Periodic Table:

-Each period is numbered, 1, 2, 3, etc.

-Elements in the 1st period will only have their 1st shell fully/partially occupied with electrons.

-Elements in the 2nd period will have their 1st shell fully occupied with electrons, and their 2nd shell fully/partially occupied with electrons.

Patterns in the Periodic Table:

-Electronic Structure

-Metals and non-metals

-Changes on ions

Reflection about the topic:

This topic is a rather disturbing one. It is very different from the easy atomic structure topic that I had learnt for the first lessons. Unlike the atomic structure, this topic requires lots of memorizing. I need to memorize the pattern in the periodic table, the grouping and the period. Memorizing these is no easy job but luckily, we do not need to memorize the periodic table at least since the school will be providing it for the tests. Though it might still take lots of efforts to memorize, but with enough preparation and memorizing, I believe I should have no problem with this topic as this topic is basically just memorizing all these groupings etc. and I would be able to easily answer all the questions.

**Lesson 3(Chemical bonding):**

Characteristic of atoms:

-Atoms bond to achieve electronic configuration of a noble gas

Chemical bonds:

-Ionic bonding

-Covalent bonding

Ionic bonding (usually formed between metals and non-metals):

-Formation of ionic bonds

-‘Dot-and-cross’ diagrams of ionic compounds

Covalent bonding (forming of bonds by sharing electrons to gain electronic configuration of a noble gas):

- Covalent bonds in elements

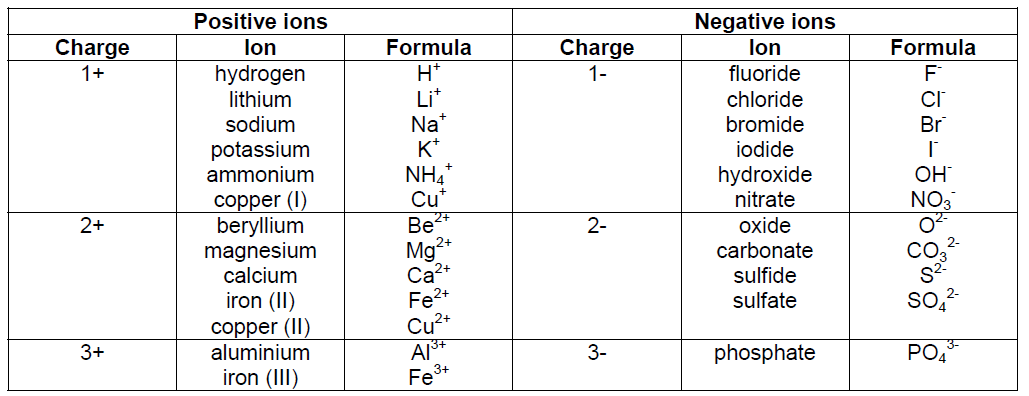
- Covalent bonds in compounds

Reflection:

This topic is mainly about atoms bonding to achieve electronic configuration of a noble gas. There is not much to memorize for this topic but instead, this topic is more of a drawing. For both ionic and covalent bonding, by the end of this topic, we should be able to draw out these different bonding for different chemical bonding. We need to be very careful during drawing these bonds as making drawing mistakes such as drawing the cross on the wrong side of the circle will mean that everything will be wrong. It is also tedious in a way that we have to indicate the changes of ions and many other things such as the arrows. This topic cannot be memorized and is not easy either. It requires lots of practises so that we can be used to different type of questions and be used to drawing the covalent and ionic bonding.

**Lesson 4(Equation writing):**

Types of Ions:



Besides classifying ions into cation and anion, ions can also be classified into:

(1) Simple ions

(2) Polyatomic ions

Formulae and Names of Ionic Compounds:

- Formulae of Ionic Compounds (The negative and positive charges in an ionic compound must be balanced so that the ionic compound is neutral)

- Naming Ionic Compounds (The ammonium ion or metal ion is always written first in the formula and in the name)

Constructing Chemical Equations:

- During a chemical reaction, new substances are formed from some starting substances. An equation can be used to represent this formation. The equation will show the starting substances (reactants) and the new substances formed (products).

Reflection:

This topic is basically the hardest one I have ever met so far this year. First and for most, I need to know the different type of ions which includes the different ions, the charges and formula for them. This is already killing me but yet, it isn’t enough. I still need to figure out how to name the ionic compound correctly and also how to write the formulae. This is even harder as till now, I have not really figured out how to write and name this formulae correctly, making frequent mistakes. This makes me even worried for my test. I just hope that with more practises, I might be able to figure out the ‘pattern’ in these questions. Adding onto the trouble on hand, this topic also includes constructing equations which is as confusing as naming and writing the formulae for ionic compounds. This is real trouble!!! Practise…practise…practise…

**Lesson 5(Acid, base and Salt):**

Acids:

-is a substance which produces hydrogen ions as the only positive ions when it is dissolved in water

Strength of an acid:

-depends on its degree of dissociation / ionisation in water to form hydrogen ions

Properties of Acids (Solutions of acids have the following properties):

1. Sour taste.

2. Change the colour of indicators (e.g. turn blue litmus paper red).

3. Contain hydrogen ions and conduct electricity.

4. React with metals, carbonates and bases.

Uses of acids:

- Sulphuric acid: in making detergents and fertilisers in car batteries as battery acid

-Ethanoic acid: to preserve food

Bases and Alkalis:

- Bases are the oxides or hydroxides of metal that reacts with an acid to form a salt and water only.

-An alkali is a metal hydroxide which is soluble in water and produces hydroxide ions (OH-) in water.

All alkalis are bases but not all bases are alkalis

Strength of an alkali:

-The strength of an alkali depends on its degree of dissociation / ionisation in water to form hydroxide ions. The properties of alkalis are due to the hydroxides ions

Properties of bases:

1. Alkalis have a soapy feel and a bitter taste.

2. Alkalis can change the colour of indicators (e.g. turn red litmus paper blue).

3. Bases can react with acids to form salt and water only – Neutralisation.

Uses of Bases and Alkalis:

-Magnesium hydroxide: in toothpaste to neutralise the acids on our teeth produced by bacteria.

-Ammonia solution: used for cleaning glass windows

Reflection:

Okay, this topic is about the same as the previous topic. They are just about the same difficulty. Last topic, I have to write the chemical equation and naming the ionic compounds but now, I have the write down the ‘working’ for the reactions of the base, alkalis and acid. This is not easy at all and there are also other things to memorize for this topic such as the properties of the base, alkali or acid. I also need to memorize the uses. For this topic, the only thing quite good about this is that I get to do a little experiment at the lab to tests out the reactions of the base, alkali and acid. These experiments include testing acid with metal and others which I will go into details at my lab reflection section. Since this topic is about the same as the previous one and that I am able to overcome the previous one, I believe that I am also able to master this topic easily with lots and lots of practise.

**Lesson 6(sex reproduction):**

Sexually Transmitted Diseases:

-Syphilis

-Gonorrhoea

-Acquired Immunodeficiency Syndrome

Consequences of Unwanted Pregnancies:

-Financial cost

-Psychologically not ready to start a family

-Career commitments.

-Individual aspirations or pursuits.

-Family problems

Consequences of Casual Sex:

-Unwanted Pregnancy

-Sexually Transmitted Diseases (STDs)

-HIV & AIDS

Consequences of Abortions:

-Guilt resulting from killing an innocent life

-Damage to the uterus and Fallopian tubes

-Public humiliation

-Deliberate ending of pregnancy

-May result infertility

-Severe cases may result in death due to excessive loss of blood

Birth Control:

(Temporary)

-Rhythm/Withdrawal/Abstinence

-Condom

-IUD

-Cap and diaphragm

-Spermicide

-Contraceptive pills

(Permanent)

-Vasectomy

-Ligation

Methods of Facilitated Reproduction:

-In-vitro Fertilisation (“Test tube baby”)

-In-situ Fertilisation (Artificial Insemination)

-Surrogate mother

Reflection:

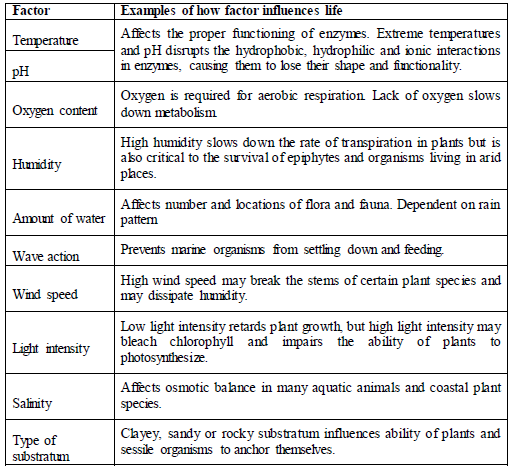
For this topic, it is more of a common sense. We all do know the different results of different acts related to sex such as results of unwanted pregnancy, results of casual sex and results of abortions. This biology topic is rather understandable as with lots of common knowledge after reading lots of books, one should not have problem understanding the key concepts. After reading through the whole topic and slides for a few times, it was easy to understand everything and I only need to focus on memorizing the pictures which includes the different parts in the male and female reproduction systems. This is the only challenge of this topic. There is a lot of pictures involved in this topic and different pictures shows different parts at different position of one similar reproduction system. Thus, I will need to practise a lot by looking through different pictures on google and try to point out the different parts in these different pictures. Still, hard work can be used to overcome all these troubles. Actually, science is basically something that requires more practise and memorizing and I should be good to go.

**Lesson 7(Ecology):**

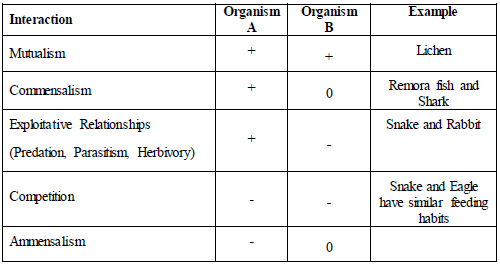
Ecology:

-Ecology is the study of interactions or relationships of organisms with one another and with the living (biotic) and non-living (abiotic) environment

Abiotic Environment:



Biotic Environment:



Feeding relationship:

-A food chain is a sequence of organisms, starting with a photosynthesizing organism (usually a green plant), through which energy is passed as one organism is eaten by the next in the sequence.

-A food web comprises interlinked food chains involving organisms from the same ecosystem.

Conservation:

1) Prevent extinction of plant and animal species

2) maintain a stable and balanced ecosystem, prevents disruption of natural cycles such as water and carbon cycles; also prevents global warming

3) Maintain large gene pool, preserve favourable genes; helps to improve agricultural produce or crops with better resistance to diseases

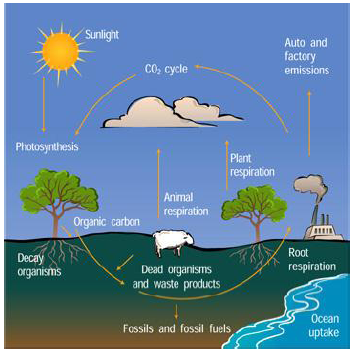
4) Conserve marine life as a food source

5) Scientific value – study of evolution

6) Nature appreciation – recreational purposes such as hiking, fishing, skiing

7) Maintain biodiversity – economical (rice, pineapple and banana are food plants developed from rainforest plants), medical (Quinine, an anti-malarial drug is found from the bark of Cinchona), industrial (latex is tapped from rubber trees and used to make tyres) purposes

Carbon Cycle:



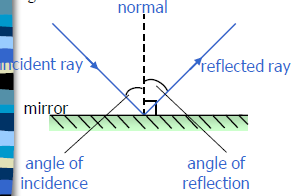
Reflection:

This topic is also a rather simple one. It does not require lots of practises but basically just memorizing. To make things easier, this topic involves some things that we learnt during our primary school life such as photosynthesis. This allowed the key concepts in this topic to be understood more easily. Some of the things, in fact, don’t require memorizing such as the biotic environment. They are more of a common sense concept that doesn’t require memorizing but just understanding. The food web is easy in this stage also as we are not required to know what eats what but instead just how the food web works. However, it is balanced with topics such as the carbon cycle and abiotic environment. Nevertheless, we do not actually need to know how the carbon cycle works but just some of the processes in it and we just need to memorize the abiotic section which is not too hard also. Thus, this topic can be counted as a ‘chicken pie’ and it is a boring one with just pure memorizing and no practical available to be done.

**Lesson 8:Reflection**

Laws of reflection:

­-The incident ray, the reflected ray and the normal all lie in the same plane

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-angle of incidence=angle of reflection

Reflection:

This topic is most probably the easiest one I have ever had this year. The topic reflection is kind of a 90% common sense topic. As we all know, we look into a mirror and we see ourselves the same distance away, inverted and the same size and this is basically what this topic is talking about. How I wish every topic is like this one. Furthermore, this topic is also learnt with lots and lots of experiment. This is not a topic that we can learn by just reading the slides and knowing the concepts. We need to test out the different lights and mirrors and see the effect with our own eyes in order to better understand this topic. This makes the topic ‘nicer’ as not only is it easy, it also provides us with lots of experiments and time to play. There is nothing wrong with this topic just that sometimes, especially in the recent test, I make mistakes while drawing the light rays. I would often miss out drawing the imaginary dotted line and thus causing me to lose some marks but luckily, it is only one to two marks out of ten marks in that question as these questions as marked according to the parts but not as a whole. This makes this topic even cooler!