

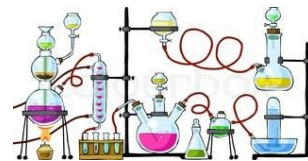
Chemistry - National 4/5

AWARD RECEIVED

You will either be presented for National 4 or 5 based on your progress throughout the year.

ENTRY LEVEL: What do I need to do it?

Ideally you will have studied Chemistry in S2/3, but this is not essential. If you are unsure whether this course is suitable please contact Mrs McDowell (PT Biology & Chemistry) for advice.



COURSE CONTENT: What will I learn?

Practical work plays a large part in the course, which comprises 3 units:

UNIT 1 - Chemical Changes and Structures - Topics studied

Rates of Reaction

The factors affecting the rates of reactions will be applied to the design and production of a foam fire extinguisher. You will work as part of a team and your product will be tested by seeing how successfully it can put out a fire.

Lessons cover:

- The effects of temperature, particle size, concentration and catalysts on reaction rates
- Calculating rates of reactions using graphs obtained from experiments
- The design, production and testing of the fire extinguisher

Atomic Structure and Bonding Related to Properties of Materials

The properties of substances depend on how the atoms, ions or molecules are held together. These forces, or bonds, can be explained if you know about the structure of atoms. To identify chemical substances you need a good understanding of how they are formed and what their properties are.

Lessons cover:

- Elements of the Periodic Table
- The Structure of Atoms
- Finding out why Distress Flares are Red
- Identifying Unknown Powders



Formulae and Reaction Quantities

Understanding chemical equations and their use in determining quantities of reactants and products is essential in the Chemical Industry.

Lessons cover:

- Writing balanced chemical equations
- Calculations relating to mass, moles, concentrations and volumes of solutions.

Acids and Bases

The Fire Brigade uses training manuals to help them treat chemical spills. Your task in this unit is to produce a manual for the Fire Brigade on how to deal with an acid spill. They will need to know what acids are and how they can be made safe.

Lessons cover:

- How Acids are Made
- Bonding and Properties of Acids
- Neutralisation Reactions
- Producing the Training Manual



Unit 2 - Nature's Chemistry – Topics Studied

Homologous Series

- Crude oil and natural gas contain hydrocarbon compounds. These can be sorted into families, or homologous series. Our society relies on them as sources of fuels, plastics, fibres and a multitude of other consumer products.

Lessons cover:

- Alkanes, alkenes and cycloalkanes
- Combustion of Hydrocarbons
- Addition reactions of Alkenes

Everyday Consumer Products

You may be familiar with alcoholic drinks like beer and wine, but alcohols have a wide variety of other uses. You may also be aware that vinegar is acidic, but it is actually a carboxylic acid known as ethanoic acid. Carboxylic acids have many uses other than adding flavour to your chips!

Lessons cover:

- Reactions and properties of alcohols and carboxylic acids



Energy from Fuels

The energy produced by different fuels varies and your task will be to compare various fuels to determine which are the most efficient.

Lessons cover:

- Energy Calculations
- Experiments to Compare Fuels



Unit 3 - Chemistry in Society – Topics Studied

Metals

Metals are finite resources with a range of useful properties. In addition to their use in construction, they are essential components of electrochemical cells.

Lessons cover:

- Extraction of Metals from Ores
- Reactions and Properties of Metals
- Investigating Electrochemical Cells

Plastics

Polythene is an example of an addition polymer. There are a range of other polymers with different properties and uses.



Lessons cover:

- Properties and uses of natural and synthetic polymers
- Manufacture of polymers by addition reactions

Fertilisers

The world's population is growing at an alarming rate and Chemistry is needed to provide plant nutrients in order to feed the world.



Lessons cover:

- Designing a fertilizer
- Production and properties of ammonia
- Production of fertilisers

Nuclear

Radioisotopes occur naturally and are decaying at various rates emitting harmful radiation.

Lessons cover:

- Uses benefits and problems of radioisotopes
- α , β and γ radiation



Chemical Analysis

Throughout the course you will become familiar with a variety of techniques for monitoring the environment and methods for reducing pollution.

TEACHING METHODS – WHAT WILL I DO?

A *Curriculum for Excellence* approach will permeate all topics, giving you opportunities to learn by discovery, take ownership of tasks, make decisions for yourself and relate chemistry to your everyday life.



You will acquire transferable thinking skills using common cross-curricular language: remembering, understanding, applying, analysing, evaluating and creating. These skills will help you to cope in all aspects of your studies and enable you to take responsibility for your own learning.

ASSESSMENT: HOW WILL I BE ASSESSED?

Assessment of work will take various forms:

- Qwizdom –multiple choice tests answered using hand held sensors.
- Traditional pen and paper assessments, covering recall of facts and problem solving skills.
- Skills may be assessed through the design of posters, leaflets or class presentations.
- Self and peer assessments will be utilised.

HOMEWORK:

The weekly homework contains numeracy, literacy and problem solving tasks. It may also include revision of class work, completion of unfinished work and opportunities to complete small projects at home on selected areas of the curriculum. You will be given the chance to present your findings to your peers.

PROGRESSION IN THE SENIOR PHASE:

Higher Chemistry.