

**SUBJECT: SCIENCE**

**AWARD RECEIVED: N3/4**

### **ENTRY LEVEL**

Students can follow this course if they have completed any of the S2/3 Electives in either Science, Biology, Chemistry or Physics.

### **COURSE CONTENT**

The Course is split up into 3 Units of theory to learn, plus an Assignment (which involves a simple bit of research and an experiment). The content of the 3 Units are outlined below:

**Fragile Earth** - In this Unit, the 'key areas' covered are from:

- **Energy:**

Learning about different energy sources, **renewable (alternative) & non-renewable energy** (including **Solar-power, wind-power, hydroelectric-power, wave-energy, tidal-energy, geothermal-energy**).

Advantages and disadvantages of different ways of **generating 'power'** e.g. the **pollution** involved, the **impact it has on the environment**, the **cost** of it.

'**Fossil fuels**', which are **coal, crude-oil and Natural gas** – and the advantages and disadvantages of those sources of energy.

**Electricity transmission**, from a power-station through the cables on the pylons of the **National Grid**, to our houses.

How **turbines** and **generators** work to produce electricity.

How **power-stations** work and how electricity gets transmitted through the cables & pylons of the National Grid.

Learning about the **efficiency** of different methods of generation and distribution of electricity.

- **Metals:**

Learning about where metals come from and how we can extract them from other stuff in the ground. Understanding the problems and risks involved in getting metals, as well as being aware of some possible solutions.

**Precious metals** e.g. Gold and where it can be found ...in Scotland !

Metals of the future,

Metal **catalysts** and how different metals 'react' with different things,

**Re-cycling** metals

- **Water:**

Learning about different sources / supplies of water, near us and around the world.

**Reservoirs, water treatment, water pipes** to houses.

The '**water cycle**'.

Looking at what is in water from a pond compared to drinking water from a tap,

**Fluoride** and **chlorine** used in water for health reasons.

Domestic use of water and also how it is important for **farming** and **industry**,

**Hydroponics** (growing plants without any soil ! ) and **irrigation**.

- **Food:**

Learning about how food can be grown and what problems there can be with that.

Investigating different plants to learn how they are similar or different.

**Nutrients** and **energy from plants**.

**Farming – livestock** ( animals ) and **crops**,

...and the problems there are for people trying to farm in different places in the world.

**Food shortages**.

**Genetically modified** foods

**Organic** food

**Human health** - In this Unit, the 'key areas' covered are from:

- **Threats to Health:**

Learning about a good, **healthy lifestyle** and what can help you have good health as well as some of the things that could be a threat to your health.

Learning about your **blood-pressure, heart beat, pulse, body temperature, body fat, vaccination**, etc.

Learning about your **heart** and your **lungs**.

Understanding some of the threats to your health, including: **smoking, drug abuse, alcohol abuse, diet, poor exercise, stress and mental health, sexual health, hygiene, poverty**, etc.

- **Health claims:**

Learning how to make sense of health claims made by companies and what you see in the media.

**Applications of Science** - In this Unit, the 'key areas' covered are from:

- **Telecommunications:**

Learning about **electro-magnetic waves**, including **radio-waves, micro-waves, infra-red ( IR ), visible light-waves, ultra-violet ( UV ), X-Rays, Gamma-waves (rays)** ...and what they can be used for.

Learning more about **sound-waves**.

Learning more about different applications of all these types of waves, including: **satellite technology, fibre-optics, opto-electronics**, screens, **loudspeakers & ear-phones, microphones, radio, mobile phone**, etc.

Learning about the applications and **telecommunications that are used in modern cars**.

- **Materials:**

Learning about the sources of materials needed to make things like: **plastics, fibres, alloys, cosmetics, 'smart' materials, re-cycled materials, biological materials**, etc.

Learning how Infra-red ( IR ) ie. heat, and Ultra-Violet ( UV ) can make some materials/things change colour (eg. mug, T-shirt, plastic toys/spoons, etc.)

Learning about '**smart fluids**' which are materials that appear to be a liquid but they can behave like a solid !

Learning about cosmetic 'wonder products' and how they may not actually be 'real'.

Learning about the Science of skin-care, including **tattoos, acne** and how it can be treated.

- **Risk and Safety:**

Identifying what things can cause a risk of harm for people, and how those risks can be reduced ( ie. minimised ) so that things can be safer ...in situations including:

**Safety at home & school,**

**Safety at work,**

**Transport safety,**

**Electrical safety,**

**Chemical safety,**

**Safety with radiation.**

All students will have access to textbooks appropriate to the Course and they will also be given access to the content in a computer software package. These are excellent resources which allow students to progress at a faster pace if they want to, and it's also a great way to get additional help for any parts of the Course that might be causing them problems.

The Science teachers are usually available either at lunchtimes and/or at the end of the day to give extra support if and when needed, throughout the year.

## ASSESSMENT

To gain an overall Award for this Course, students need to pass the **Course Assessment**, which includes:

- 1) a **Unit Test for each of the 3 Units** – these are done in class and marked by your teacher, (...**you will be given a list of any equations you'll need to use, which makes these easier !** )
- 2) an **Outcome 1** - which is a simple 'write-up' of an experiment you do in class,
- 3) an **Assignment** - this involves you doing a simple piece of research along with an experiment so that you can write a brief Report of what you investigated and found out. You can do this on your own if you like or, if you prefer, you can work in a small group.

The Course Assessment is graded as either a **Pass** or a **Fail**, and that is determined by how well you perform in each of the different parts.

### **HOMEWORK**

Homework is an essential part of the course for those students who want to make good progress. Homework will include questions and problems from a textbook and/or worksheets and regular revision of all the material covered in the course.

The Science teachers are usually available at lunchtimes and/or at the end of the day to give you help with your Homework – so it's easy to get it all done...correctly !

### **TRANSFERABLE SKILLS**

There are many very useful and valuable transferable skills gained by studying N4 Science, including: researching, ICT, reporting, numeracy, literacy, graphing, investigating, practical experimental skills, analysing, presentation, evaluating... to name just a few.

### **PROGRESSION**

There is good progression from this Course on to N4 Biology, Chemistry or Physics, which could then possibly lead on into N5 Biology, Chemistry or Physics...and perhaps then onto a Higher course.