SCIENCES

Sciences options for S3 - your questions answered

What is different about option choices in the Science Department?

- You have studied "Science" in S1 and S2.
- Now you will choose from Biology, Chemistry, Physics and Environmental Science as you continue with your Broad General Education.
- You can choose one or two of Biology, Chemistry and Physics.
- If you choose Environmental Science that would usually be your only science.
- If you are interested in a career in science or technology, you should think about choosing more than one science.

What are Biology, Chemistry and Physics?

Here is a reminder of the topics you studied in S1 and S2, and which science they involve. Environmental Science covers work from almost all of these topics.

First Year		Second Year	
What's the Matter	Chemistry	Biotechnology	Biology
Cells	Biology	Heat	Physics
Light & the EM spectrum	Physics	Awesome Acids	Chemistry
Made in the Stars	Chemistry	Forces	Physics
Life on Earth	Biology	Chemical Reactions	Chemistry
Electricity	Physics		

Which is the easiest science?

Biology, Chemistry and Physics have been designed to be the same difficulty. They all involve numeracy, literacy and problem solving skills. These courses will lead to National 4 and 5 courses in S4.

Environmental Science is more suited to those who have found science difficult in S1/2. It will lead to National 3 and 4 courses in S4. Your science teacher will advise you which level would suit you best.

What are the courses like?

In the S3 BGE you will work on a variety of topics that will build on work from S1/2.
You will then move on to National courses which you will sit in S4.

The following pages give more information about the individual sciences.
For more information speak to your science teacher, or to Mr. Miller (Principal Teacher of Science) in Science Room 5.

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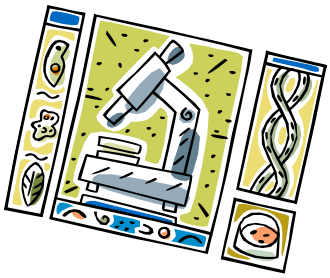
BIOLOGY

Biology is the study of living things (plants and animals) and how they interact with their surroundings.

In S3 Biology you will do a variety of activities including practical work, and the course is suited to a wide range of pupils.

The Broad General Education has the following units:



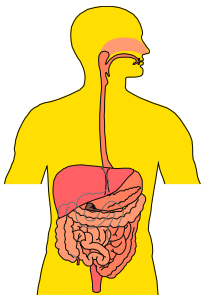
Cell Biochemistry

In this unit, you will learn about cell structure and processes within cells, such as respiration, as well as DNA, protein and biotechnology. You will also find out about enzymes, therapeutic uses of cells, and controversial biological procedures.

The World We Live In

This unit is about world ecosystems, evolution, natural selection and competition, behaviour, biodiversity, decay, recycling, microorganisms and ethical issues.

You will be given homework at the end of each topic, and regular assessments so that you know how you are coping with the course work.



In S4 you can sit National 4 or 5 Biology.
In S5/6 you can study National 5 Biology or Higher Human Biology.

Here are some ideas of careers that involve biology:

Physician, Nurse, Physical therapist, Chiropractor, Podiatrist, Exercise physiologist, Nutritionist, Dietician, Pharmacist, Lab technician, Forensic scientist, Pathologist, Emergency medical technician, Vet, Vet assistant, Zoologist, Marine biologist, Wildlife biologist, Fisheries biologist, Animal trainer, Biology Teacher, Agricultural research, Botanist, Forest service, Soil scientist, Horticulturist……..

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CHEMISTRY

Chemistry is the study of natural substances, what they are made of and how they are used in living things. It is vital to every aspect of our lives. Chemistry is often called the "central science" since it links with the other sciences and is involved in many branches of technology. It is a good choice if you want to keep your options open, and it is worth noting that not all chemists wear white coats!

Throughout the S3 BGE course you will learn about atoms, how they make up matter and how they interact with each other to make all the substances we use in our everyday lives. You will also learn how these substances are produced on an industrial scale and about the environmental issues associated with producing these chemicals. Along the way, you will develop many skills such as analysing data from experimental work, evaluating the validity of experimental procedures and making predictions based on knowledge gained and experimental work undertaken.

There are three Units in these courses:

Building Blocks and Chemical reactions
You will do experiments and develop skills. You will think about ethical and environmental issues, and learn how the chemistry of the atom affects our everyday lives.

Fuels and Hydrocarbons
You will use everyday products such as cosmetics, fuel and food. You will learn how chemistry is involved in materials we use every day, and consider environmental and ethical issues.

Everyday and Industrial Chemistry
You will have a chance in this unit to develop scientific thinking skills through investigating new materials and energy sources.

A variety of teaching and learning approaches are used to suit a wide ability range of pupils. The course booklets are "write-on" to allow all pupils to access the curriculum. Booklets also contain extension materials to stretch the more able. You will be given homework every week and regular assessments so that you know how you are coping with the course work.

In S4, you will be presented for National 4 or 5 awards. In S5/6, you can study National 5 or Higher Chemistry.

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PHYSICS

Physics helps us to explain how everyday things work. Physics is at the heart of engineering and technology, and is an exciting and modern science subject. It uses the latest technology, including ipads, interface units and electronic sensors.

A qualification in Physics is well respected by employers, colleges and universities.

Your Broad General Education physics course in S3 will have three units:

Waves
Different types of waves – sound, light, electromagnetic.
How they are used in medicine and communications.
Echo-sounding (sonar), ultrasound, fibre optics, mobile phones, infrared, ultraviolet, X-rays, lasers.

Movement and Forces
Measuring speeds of vehicles, acceleration, light gates, gravity, forces, friction, air tracks, aerodynamics, seat belts, crumple zones, car safety.

Space
The Universe and how it began, galaxies and stars, rockets, space flight, satellites, the risks and benefits of space exploration, astronomy, light years, exoplanets, the Hubble telescope, re-entry, telescopes.

The Physics course is suited to a wide ability range of pupils. Physics is a practical subject and you will do a lot of experiments. You will often use computer simulations, quizzes and websites. You will also spend a lot of time in class doing calculations and improving your numeracy skills. Homework is issued weekly, and regular assessment will give you a good idea of how you are progressing.

In S4 you can study Physics at National 4 or 5 level.
In S5/6 you can study National 5 or Higher Physics.

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ENVIRONMENTAL SCIENCE

This course is great for pupils who don't want to go on to National 5 in S4, but instead have a broad experience of different sciences. If you like Environmental Science, it may be possible to keep studying and progressing in fifth or sixth year.

Environmental scientists are involved in tackling issues such as global climate change, pollution, the use of land and water resources and changes in wildlife habitats.

The Environmental Science Course covers the living environment, the Earth's resources and sustainability.

There are three units in the course:

Living Environment
Interdependence, food chains and food webs, adaptation, ecosystems, population growth, biodiversity, the nitrogen cycle, fertilisers.

Earth's Resources
Responsible use of non-renewable and renewable resources. Fossil fuels, uses of materials derived from crude oil. Risks and benefits of different energy sources, including those produced from plants. The balance of gases in the air.

Sustainability
Natural resources and how they affect human activity. The interaction between humans and the environment, and the impact of human activity on an area. The role of agriculture in the production of food. Society's energy needs. Sustainable transport systems.

There will be a variety of learning activities, including practical work.

The course is fun, and involves work in the school grounds and the local environment. You will go on some trips too.

There will be no final SQA exam. To pass the course you have to pass all the unit tests and complete an Assignment.

For more information about the course, speak to Mrs Scoular in Science room 4.