



Groby Community College
Achieving Excellence Together

SCIENCE

APPLIED
SCIENCE



BIOLOGY

CHEMISTRY



PHYSICS

SCIENCE ENTRY REQUIREMENTS

BIOLOGY, CHEMISTRY & PHYSICS

The entry requirements In order to be automatically accepted on to any of the above science courses we expect students to have achieved a minimum of two B's in Science and Additional Science examinations. This must be achieved through the higher paper examinations.

Coursework grades should also be a B, and these will not be able to substitute for B's through examinations. Students must also achieve a minimum of grade C in Maths.

APPLIED SCIENCE

The entry requirement for this is 2 grade C's in Science.

BIOLOGY A LEVEL

The specification that we follow at Groby Community College is OCR. The AS award is taught in year 12 and students wishing to continue the subject complete A2 in year 13. The scheme of assessment detailed below has a linear structure (examined in June only) and is for first teaching in 2015.

What are the aims of this course?

AS and A2 level biology should encourage students to:

Develop essential knowledge and understanding of concepts in biology, and the skills needed to use these in new and changing situations

Develop an understanding of scientific methods

Be aware of advances in technology, including information technology, relevant to biology

Recognise the value and responsible use of biology in society

Sustain and develop their enjoyment of, and interest in, biology.

What sort of things will I be learning about?

The following table includes a summary of subject content for the AS and A2 modules. This is an accredited specification, but still in preparation at the exam board level.

Level	Module title	Subject Content
AS/A2	Module 1— Development of practical skills in Biology	Skills of planning, implementing and evaluation. This covers the practical skills that students develop throughout the course. Assessed via written examinations, this module underpins the entire specification.
AS/A2	Module 2— Foundations in Biology	Covers concepts required throughout the remaining modules. Includes Cell Structure, Biological molecules, nucleotides and nucleic acids, Enzymes, Biological membranes, Cell diversity and cellular organisation.
AS/A2	Module 3—Exchange and Transport	Exchange surfaces, Transport in animals, Transport in plants.
AS/A2	Module 4— Biodiversity, Evolution and Disease	Includes: Communicable diseases, disease prevention and the immune system. Biodiversity, classification and evolution.
A2	Module 5— Communication, Homeostasis and Energy.	Homeostasis, neuronal and hormonal communication, plant and animal responses. Photosynthesis, Respiration, Excretion.
A2	Module 6—Genetics, Evolution and Ecosystems.	Cellular control and inheritance, manipulating genomes, biotechnology, cloning and populations.

A Level BIOLOGY Continued..

In addition A level biology should encourage students to:

Show knowledge and understanding of the facts, principles and concepts from different areas of biology and to make and use connections between them.

The first four units constitute the stand-alone AS qualification, modules 1-6 combined with the Practical Endorsement constitute the full A-Level.

The following tables are designed to show how the course is assessed:

Advanced Subsidiary (AS) Award

Assessment Type	Title	Duration	Percentage of total AS mark
Written Exam Paper	Paper 1—Breadth in Biology	1 h 30	50
Written Exam Paper	Paper 2—Depth in Biology	1h 30	50

Advanced (A2) Award

Assessment Type	Title	Duration	Percentage of total A2 mark
Written Exam Paper	Paper 1 - Biological Processes	2h 15 minutes	37
Written Exam Paper	Paper 2—Biological Diversity	2h 15 minutes	37
Written Exam Paper	Paper 3—Unified Biology	1h 30 minutes	26
Teacher Assessed	Practical Endorsement for Biology	Non-Exam	Pass/Fail. Reported separately

The biology course covers a wide range of material and is good preparation for anybody wishing to study Biology, or related subjects to a higher level. The course has many links with Applied Science, Chemistry, PE and Psychology.

The Biology team at Groby Community College are a dynamic and enthusiastic team. We are a very supportive bunch and always on offer to give you a helping hand. Weekly 'Biology Surgery' sessions take place to support students requiring additional help. Students can bring homework or class work to these sessions and Biology teachers will be on hand to help.

Biology is not an easy subject and to be successful you will have to work hard. We hope you find the course enjoyable and rewarding.

For more information about this subject, please contact
Seran Bradley, Science Dept
Tel: 0116 2879921

CHEMISTRY A LEVEL

The Year 12 topics extend and develop some of the ideas you have learnt at GCSE. Throughout both courses the effect of electron arrangement, energies and structure on chemical behaviour is stressed. You need to be able to learn the fundamental laws and principles of Chemistry and then apply them to unfamiliar situations.

The coursework element assesses your practical skills so you need to be good at carrying out experiments, as well as analysing data produced and evaluating the experiment.

AS Advanced Subsidiary in Chemistry

Unit	Content	Assessment	Weighting (% of final AS mark)
Atoms, bonds and groups F321	This unit builds on key concepts studied at GCSE including atomic structure, chemical reactions and chemical calculations. Improved models are used to develop understanding and the work in this unit underpins much of the further work at both AS and A2	1 hour written paper	30%
Chains, energy and resources F322	This unit builds on the study of carbon chemistry introduced at GCSE. As well as developing work on functional groups such as alkanes and alkenes, it introduces new functional groups and the concept of reaction mechanisms. Energy changes in reactions are also studied at a quantitative level. This is linked to the use of hydrocarbons as fuels and the role chemists have in ensuring such materials are used effectively.	1 hour 45 min written paper	50%
Practical Skills F323	A series of practical tasks that test the ability of the candidate to observe, measure, process data and evaluate data in the context of the ideas studied in Units 1 and 2	Internally assessed	20%

The Year 13 topics extend and develop some of the ideas you have learnt during Year 12. Throughout both courses the effect of electron arrangement, energies and structure on chemical behaviour is stressed as key synoptic concepts. You need to be able to learn the fundamental laws and principles of Chemistry and then apply them to unfamiliar situations.

The coursework element assesses your practical skills so you need to be good at carrying out experiments, as well as analysing data produced and evaluating the experiment.

A2 - Advanced GCE in Chemistry

Unit	Content	Assessment	Weighting (% of final AS mark)
Rings, polymers and analysis F324	This unit provides candidates with a deeper knowledge and understanding of how organic chemistry shapes the natural world and how organic chemicals provide many important materials. It also builds knowledge and understanding of how amino acids are the building blocks of polypeptides and proteins, the preparation of synthetic condensation polymers and the importance of synthetic organic chemistry, including analysis of products.	1 hour 15 mins hour written paper	30%
Equilibria, Energetics and Elements F325	This unit provides students with a quantitative study of physical chemistry. For example, the qualitative treatment of reaction rates and equilibria encountered at AS is developed within a quantitative and graphical context. It also builds on the study of Energetics at AS considering ways in which scientists are working to provide cleaner and more efficient energy. Many of these concepts are then applied synoptically to the Transition Metals.	2 hours written paper	50%
Practical Skills F326	A series of practical tasks that test the ability of the candidate to observe, measure, process data and evaluate data in the context of the ideas studied in Units 4 and 5	Internally assessed	20%

For more information about this subject, please contact
David Brentnall or Marcus Miola, Science Dept
Tel :0116 2879921

A LEVEL PHYSICS

OCR AS (H156) / A Level (H556)

These courses have been developed for students who wish to continue with a study of physics after GCSE. Such a course will prepare students to progress into further education, to follow courses in physics, engineering, one of the other sciences or related subjects, or to enter employment where a knowledge of physics would be useful.

The course is structured into 6 modules:

Module 1 – Development of practical skills in physics Skills of planning, implementing, analysis and evaluation	
Module 2 – Foundations of Physics Includes: Physical quantities and units Scalars and Vectors Measurements.	
Module 3 – Forces and motion Includes: Motion Forces in action Work, energy and power Materials Newton's laws of motion and momentum.	Module 4 – Electrons, waves and photons Includes: Charge and current Energy, power and resistance Electrical circuits Waves Quantum physics.
Module 5 – Newtonian world and astrophysics Includes: Thermal physics Circular motion Oscillations Gravitational fields Astrophysics.	Module 6 – Particles and medical physics Includes: Capacitors Electric fields Electromagnetism Nuclear and particle physics Medical imaging.

A Level Physics continued

Assessment of AS level Physics

		Marks	Duration	Weighting
Paper 1	Breadth in Physics Modules 1, 2, 3, 4		1 hour 30 minutes	50%
	Section A Multiple choice	20		
	Section B Structured questions covering theory and practical skills	50		
Paper 2	Depth in Physics Modules 1, 2, 3, 4		1 hour 30 minutes	50%
	Structured questions and extended response questions covering theory and practical skills	70		

Assessment of A level Physics

		Marks	Duration	Weighting
Paper 1	Modelling Physics Modules 1, 2, 3, 5		2 hours 15 minutes	37%
	Section A Multiple choice	15		
	Section B Structured questions covering theory and practical skills	85		
Paper 2	Exploring Physics Modules 1, 2, 4, 6		2 hours 15 minutes	37%
	Section A Multiple choice	15		
	Structured questions covering theory and practical skills	85		
Paper 3	Unified Physics All modules		1 hour 30 minutes	26%
	Structured questions and extended response questions covering theory and practical skills	70		
Non exam assessment	Practical endorsement for Physics	Pass / Fail	Non-exam assessment	Reported separately
	Minimum of 12 practical activities completed. Competence reported separately to the A level grade	70		

For further information, please contact
Carol Hubbard on 0116 287 9921

APPLIED SCIENCE

A LEVEL

Currently studied with AQA

For a number of years we have offered A level Applied Science at KS5. In June 2014 we were informed by the exam board AQA that the course may be discontinued under direction from Ofqual, and that AS students beginning in September 2014 would be the final students through the course.

To date the final decision on this has not been given and so we are waiting to hear from AQA as to whether the course will continue or if not be replaced with an alternative.

We are also exploring other options such as running a BTEC Level 3.

Applied Science has been popular and successful so we are keen to continue to offer a course which is accessible to a range of students and covers a broad range of subjects within the science curriculum. There will certainly be an equivalent course in place for September 2015 and information will be on the school website as soon as we are in a position to make an informed choice.

For your information we have provided the 'current' course content.

In the meantime, if you have any questions regarding Applied Science please contact
Ross Dixey on 0116 2879921
or email rdixey@grobycoll.com

A LEVEL APPLIED SCIENCE (2014)

The AQA GCE Applied Science course will allow you to study how science is applied in many different types of professions and industries. The focus of the course is scientific usage, concentrating on how scientists and others use science in their work. During this course you will be given the opportunity to visit scientific workplaces and meet people who use science on a daily basis. You will also learn how science contributes to our lifestyle and the environment in which we live.

Course Content

During this course students are able to:

- Follow a programme of learning which is practical - based and which improves practical skills
- Follow a balanced science programme covering biology, chemistry and physics
- Visit scientific workplaces
- Work independently on a number of projects
- Learn about the work of different types of people using scientific skills that they use
- Gain ideas about employment opportunities in science
- Prepare for higher and further education courses
- Keep track of progress and achievement throughout the course by a programme of continuous assessment
- Develop ICT skills for presenting work and researching information.
- Develop skills in monitoring and recording experimental work

Course content and assessment

Year 1—Applied Science Course /Module details

	Title	Assessed by...	Percentage
Unit 1	Investigating science at work: study the use of science in different organisations local to you. Discover the scientific skills and qualifications required by a range of workers.	Coursework portfolio	33.3% (16.7% of A2 grade)
Unit 2	Energy transfer systems: how both human and physical systems exchange energy. Much of the content is medical based, and contains aspects of biology and physics.	Examination	33.3% (16.7% of A2 grade)
Unit 3	Finding out about substances: contains 9 practical investigations set in a vocational context. The content covers both theoretical and practical aspects of chemistry.	Coursework portfolio	33.3% (16.7% of A2 grade)

Year 2—Applied Science Course /Module details

	Title	Assessed by...	Percentage
Unit 7	Planning and carrying out a scientific investigation: you will create your own antibacterial soap from scratch. You will need to conduct numerous trials to find the best method for creating the soap, and the best antibacterial to add to it.	Coursework portfolio	16.7% of A2 grade
Unit 9	Sports science: you will design, carry out and evaluate a 8 week fitness programme aimed at improving performance in chosen areas of a sport.	Coursework portfolio	16.7% of A2 grade
Unit 11	Controlling chemical processes: you will learn about different industrial processes and the chemistry which must be used to understand them and make the processes efficient.	Examination	16.7% of A2 grade