

science

AS/A2 Biology
AS/A2 Chemistry
AS/A2 Physics
AS/A2 Applied Science



Welcome to the Faculty of Science at Carmel College

At Carmel, Biology, Chemistry, Physics and Applied Science are grouped within the Faculty of Science. All the courses are very successful and all are very popular. There is therefore a large intake of new students each year.

Each course aims to develop a sound understanding of scientific principles and hence prepare you for an increasingly complex world. As a student within the area you will be treated as an individual and you will enjoy your studies. Your progress will be constantly assessed to ensure that you are achieving your full potential. Very high pass rates are obtained in all subjects and the majority of students proceed to their preferred Higher Education course. These include pure science, engineering, medicine, computing, mathematical and sports orientated degrees.

carmel
college



meet the students

ANDREW MIDDLETON

De La Salle

Studying: Biology, Maths, Chemistry, Geography

Whilst studying Biology at Carmel I have particularly enjoyed doing the dissections of the heart and lungs. I also liked the physiology and anatomy aspects of the course due to their relation to my chosen career. As part of Enrichment, I completed the Duke of Edinburgh Award which helped with my university application. There are lots of trips to go on at Carmel and I was lucky enough to visit Iceland, with the Geography department, which is a place I would have never expected to see. When I leave I want to go to Sheffield University to study Medicine and hope to pursue a career as a doctor in the army.

meet the staff

Biology Tutors:

PERPETUA JONES

Head of Department

CARMEN NUNEZ

LYNDSAY SMITH

RUTH CAREY

EVELYN MCQUEEN

SUE ODLIN

ANDREA STILES

AS/A2 Biology

EXAM BOARD: OCR

WHY CHOOSE BIOLOGY AT CARMEL?

Our AS results are excellent and well above the national average. Out of the 196 students who studied Biology to AS at Carmel last year 56% of them gained A – C grades. Many of them continue to A2 and last year out of the 137 A2 students 68% achieved A – C grades. You will be taught by an enthusiastic, caring team who are committed to your success in the subject. You will have the opportunity to experience a wealth of enrichment activities – see the College website for some of our latest excursions – fieldwork on Ainsdale Beach, visit to Chester Zoo and trips to London and Holland.

Members of the department are experienced examiners and moderators and we invite the Chief Examiner for OCR to Carmel to help you prepare for your examinations.

WHAT WILL THE COURSE INVOLVE?

You will enjoy a wide range of learning experiences, including practical work, practice exam questions, printed notes and lots of interactive fun activities.

The AS course covers fundamental biological principles and how this knowledge is used in the 21st century, for example in stem cell research. Students will enjoy the new module Food and Health

where we look at the effect of diet on the body and other health related issues. At A2, students will study more detailed aspects of Biology and their applications in modern scientific research are emphasised. Homework is set regularly to test your understanding and you will be given feedback on your progress.

HOW WILL I BE ASSESSED?

The AS course is made up of three modules. One theory module is examined in January and the other in June. Throughout the year students carry out practical investigations which contribute to their practical mark. This component is intended to develop skills in planning, implementing, analysing and evaluating experimental work. At A2, a further three modules are studied, 2 theory and 1 practical.

WHERE DOES THIS COURSE LEAD?

There are many careers for which Biology is either essential or very useful - medicine, nursing, dentistry, physiotherapy, health education, veterinary science, agriculture, pharmacy, pharmacology, bio-chemistry, PE, psychology, speech therapy, forestry, biotechnology, food science, microbiology, laboratory work, radiography and teaching.

What is the Science department like?

From September 2009, Science students have been studying in the newly built teaching block which provides a modern and spacious, state-of-the-art learning environment. The facilities for Science are outstanding with nine very well equipped laboratories, two computer suites and four tutorial bases. Other rooms also exist for the degree students. The majority of the laboratories “belong” to a single department and you will therefore generally attend the same room throughout the week for your lessons. All rooms in the new building are equipped with interactive white boards, multi-media projectors and wireless internet connection enabling internet research to be done in the laboratories.

EXAM BOARD: OCR

WHY CHOOSE CHEMISTRY AT CARMEL?

Both the AS and A2 results are outstanding with students achieving 52% A-B at AS, and 62% A-B at A2 level. These results are significantly higher than the national average and much greater than those of other local colleges. The chemistry tutors are extremely committed to ensuring that you will be given the help you need to achieve at your highest possible level.

All the tutors are very friendly and develop good relationships with students, so they will support you fully and ensure that you are successful. One member of the chemistry team is an experienced OCR examiner, which is extremely valuable when helping to prepare you for external examinations.

WHAT WILL THE COURSE INVOLVE?

You will be given a comprehensive set of interactive notes, which provide a detailed coverage of the course specification. The notes also include many practice questions that will allow you to consolidate your understanding of the material being covered. Regular practical sessions will help to develop your chemical techniques and laboratory skills, which will be invaluable for future science related careers. These practical sessions are closely linked to the theory taught in lessons

as this proves an effective way of developing your grasp of the theoretical concepts covered. Regular homework and end of topic tests are used to inform both you and your tutor of your progress in the module.

HOW WILL I BE ASSESSED?

The AS course consists of 2 modules, one which is examined in January the other examined in June. The coursework element of this subject is assessed throughout the year by a series of assessed practicals. Likewise the A2 course contains 2 modules, one examined in January the other in June. Once again the coursework element is assessed through a series of practical assessments which occur throughout the A2 year.

WHERE DOES THIS COURSE LEAD?

As well as being an important subject in its own right, Chemistry is an essential requirement for medicine, dentistry, and veterinary science. In the past our students have entered University to follow many different courses: - pharmacy, medicine, dentistry, physiotherapy, analytical chemistry, pure chemistry, forensic science, biological and environmental sciences, law, engineering and business.



meet the students

JONATHAN LATHAM
St Augustine's

Studying: *Biology, Chemistry, Computing*

I decided to study Sciences at Carmel because I'd always had an interest in science at school and was fascinated by the way the concepts could be applied to everyday situations. I chose Chemistry specifically because it is integral to the other sciences and uses logical concepts to explain everyday life. The Chemistry course at Carmel is very well structured, and there is always extra support available from tutors if you need it. I also really enjoyed the Nuffield Bursary placement I did over the summer which was organised through Chemistry. When I leave Carmel I will be going to study Medicinal Chemistry at Manchester University.

The Nuffield Bursary Scheme

Each year around 5-8 of Carmel's most dedicated and high achieving Science students successfully gain a place on the Nuffield Bursary Scheme, which is organised by SETPOINT. The students take part in a four week paid project during the summer of their first year of A Levels. The project is then written up and presented at a regional final. There are around 200 applicants per year across Merseyside, Cheshire and Warrington, with only 100 placements available within Science and Industry.

In 2007, Carmel student Lindsey Flanagan was runner-up in the National Finals, having been involved with a project linked to the optometry department at Liverpool University. She won £750 for both herself and Carmel College.

meet the staff

Chemistry Tutors:
GILL TOWNSEND

Head of Department

SHAUN CHARLES

VICKI COLLINGS

JIM ASHBROOK

CHERYL GREENHALGH

SIAN JONES

AS/A2 Applied Science

EXAM BOARD: AQA

WHY CHOOSE APPLIED SCIENCE AT CARMEL?

Carmel College has a strong tradition of successful vocational science teaching over many years. Your expert tutors will give you extensive support and guidance throughout your time on the course both during lessons and through the college tutorial system. We pride ourselves on taking a personal interest in your success.

WHAT WILL THE COURSE INVOLVE?

The AS course covers all three sciences of Biology, Physics and Chemistry but in an “applied” context. That means that you will not only learn the science but also how it is used in real life organisations. The A2 course is currently biased towards Biology, through our choice of Sports Science and Healthy Body units, although you can choose a Physics or Chemistry based project for the Investigation unit if you wish. You will sometimes work on your own and sometimes in small groups. We will teach you the research and study skills you need for success. You will also visit scientific workplaces to learn how science and scientific skills are used professionally. You will gain ideas about career opportunities in science. ICT is used extensively and you will have ready access to a wireless network using laptop computers in the laboratory.

HOW WILL I BE ASSESSED?

The single award AS consists of 2 coursework units and 1 examination unit. You will be given detailed guidance, plenty of support and a structured timetable for completion of each coursework portfolio. The examination is taken in May or June. The single award A2 is taken in the second year after successful completion of the AS course. It involves a further 2 coursework units and 1 examination unit.

WHERE DOES THIS COURSE LEAD?

The GCE in Applied Science will prepare you for a career in many science-based industries and organisations. It will also support those who are interested in other careers for which science is important such as Primary Teaching, Childcare, Nursing, Sports Management or Sports Training. Many former students have progressed to university to study a wide range of subjects including Forensics, Construction, Animal Behaviour, Biochemistry, Physiotherapy and Biomedical Sciences. Other students have chosen to follow Apprenticeships in areas such as Laboratory Work and Engineering.



meet the students

REBECCA STEELE St Cuthbert's

*Studying: Applied Science,
Accounting, Combined English,
Maths*

At Carmel you get to learn so many new things. I find Applied Science really interesting and particularly enjoy learning about the body and the forces. As well as my main subjects I also chose Animation in Flash for my Enrichment activity which was great as I learnt how to write notes in an interesting way. One of the things that impressed me most when I first came to Carmel was the size of the library – there are loads of books to help with your homework. When I leave I hope to go to university to study Accounting and Finance and eventually become a Chartered Accountant.

meet the staff

Applied Science Tutors:

JEREMY BOWLER

Head of Department

SUE ODLIN

DARYL DOYLE

JAMES ASHBROOK

Technical Support Staff:

PAUL WHORTON

LYNN PARR

JACKIE WILCOCK

What other activities do Science students get involved in?

At Carmel we provide students with many opportunities to become involved with external activities. These range from involvement in the Nuffield Bursary Scheme, through vocational work placements, to competitions such as the Physics Olympics. All the departments regularly undertake trips and local destinations include Daresbury Atomic Laboratories, Fiddlers Ferry Power Station, and Chester Zoo. Opportunities for overseas visits exist and recent “excursions” have included Biology trips to the Azores and Holland and a science trip to CERN in Geneva.

We have strong links with all the local universities and so use their expertise whenever possible, for example, the Chemistry department uses the spectroscopy equipment in both Manchester and Liverpool Universities.

EXAM BOARD: OCR

WHY CHOOSE PHYSICS AT CARMEL?

The physics department at Carmel is excellent and students taking physics are highly successful. Both the AS and A2 results are outstanding with students achieving 48% A-B at AS, and 57% A-B at A2 Level. All the tutors are very friendly and approachable and they have a wide range of experience to help support you. This expertise ranges from careers guidance, through specialist subject knowledge, to experience of examination marking.

A wide range of support and guidance will be available outside of lessons, and tutors will happily give up their time to help you to extend your understanding.

WHAT WILL THE COURSE INVOLVE?

Physics is a key part of science and technology and it appeals to those people who want to understand the world around them. The course delivers physics in a stimulating manner whilst ensuring that the basics necessary for further study are covered. Astrophysics, particle physics, quantum physics, and technological applications such as medical physics, are some of the areas that you will find particularly enjoyable. You will be given an excellent set of notes that have been written by the staff to cover the specification. Problems are studied, both in class and for

homework, to help you to explore how the theories are applied to real-life situations.

Practical work is regularly undertaken, via class experiments and in the practical unit.

Both tests and homework are regularly set to monitor your performance.

HOW WILL I BE ASSESSED?

For the AS award two units are examined, and the third unit is based on practical skills. This subject is extended to A2 in which two units are again examined and the third is based on practical skills tests.

Exams are taken in the January and June, of each year.

WHERE DOES THIS COURSE LEAD?

Physics is a fascinating subject to study at higher level and physics graduates are in demand because of their intelligence, analytical skills and proven ability to solve problems. Physics is an essential requirement for a number of careers and in the past our students have entered a broad range of areas e.g. Pure and Applied Science, Engineering, Medicine, Computing, Architecture etc.



meet the students

JENNIFER TEASDALE The Bankfield School

Studying: Physics, Maths, Further Maths, History, Critical Thinking

Carmel is a great place because support is always available from tutors and the college is very successful in getting students the best results they can. I enjoy the more practical side of Mathematics, and Physics puts this to use in a different and interesting way. As well as my main subjects, I have taken part in Welcome Host Enrichment, which gave me useful customer service skills and a qualification that will improve my CV for the future. At Carmel the tutors encourage students to fulfil their potential and they dedicate their time to any students who need help. After I leave college, I hope to go to Bath University to study Automotive Engineering making use of the Physics and Maths skills I have gained at Carmel.

What support will I receive in the Science Department?

Tutors within science will “go the extra mile” to ensure that you will succeed. Individual and small group support sessions are timetabled in the science tutorial base. In addition tutors will make themselves available should you feel that individual help is required. Revision skills tutorials are provided to help you to develop the techniques that you will need to succeed both at A Level and in Higher Education.

Tutors have regular contact with your parents and will keep them informed regarding your progress. Enrichment sessions will be provided to extend even the most able, including preparation for the BMAT exams and competitions such as the Physics Olympiad and AS National Competition.

meet the staff

Physics Tutors:
EDWARD SWANN
Head of Department

CHARLIE BURTON
MALA SANDHU
MICK MARTIN



Biology trip to Body Worlds Exhibition at the O2 Arena



Students visit CERN in Geneva



Biology trip to Arnhem Zoo



Biology Department trip to London

more information

The specifications for Biology, Chemistry and Physics can be obtained from:

www.ocr.org.uk

The specification for Applied Science can be obtained from:

www.aqa.org.uk

How Successful are Carmel's Science Students?

2009 EXAMINATION RESULTS

AS LEVEL	%A-B	%A-C	%A-E
BIOLOGY	36	56	94
CHEMISTRY	52	79	95
PHYSICS	48	65	94
A2 LEVEL	%A-B	%A-C	%A-E
BIOLOGY	38	68	97
CHEMISTRY	62	84	99
PHYSICS	57	72	98

Enriching Experiences

BIOLOGY TRIPS

AS and A2 Biology students visited London in December 2008 for the Body Worlds Exhibition at the O2 Arena. Our first afternoon was spent at the Natural History Museum where the massive dinosaur skeleton made a huge impression on the students! We also took a flight on the London Eye to see London by night which was quite an experience. The following day it was time for the highlight of the trip at the O2 Arena, and it didn't disappoint. Everyone agreed that the exhibition was fantastic - "Body Worlds is boss", "amazing", "moving" and "inspirational" were just some of the students' comments.

In April 2009, another group of Biologists went on the overnight ferry to Holland where they visited the world class zoo at Arnhem. The zoo is divided into different regions of the world so students were able to experience rainforest, desert, bush and ocean ecosystems. The trip was a resounding success, as were the "all you can eat" breakfast and dinner buffets on the ferry!

CHEMISTRY MASTERCLASS

In Summer 2009, 40 Chemistry students went to the University of Liverpool to spend a day in the undergraduate laboratories. They used much of the specialist equipment including a rotary evaporator, an NMR spectrometer and a mass spectrometer. They were also able to carry out molecular modelling on a computer. The visit provided the students with an insight into degree level laboratory work and it gave them a chance to see, for real, the analytical techniques they had learnt about.

CHEMISTRY OLYMPIAD

Four students took part in the first round of the Royal Society of Chemistry's Olympiad competition in March which involved a challenging written test of chemical knowledge. The students were all A2 Chemistry students, Jonathan Latham, Chris Sherer, Nick McCaul and Jibreel Haddad. Three Bronze certificates and a Commendation were awarded to the students after they sat the two hour examination.