

Sir John Cass Red Coat School Programme of Study – Key Stage 4
Subject: Additional Science

***Students embark on GCSE Science from year 9**

Year 9	Year 10	Year 11
<p><u>Topics Covered/ Areas of Focus:</u></p> <ul style="list-style-type: none"> • B1 (Biology core unit) • C1 (Chemistry core unit) • P1 Topic 1-3 only (Physics core unit) 	<p><u>Topics Covered/ Areas of Focus:</u></p> <ul style="list-style-type: none"> • P1 Topic 4-6 only (Physics core unit) • B2 (Biology additional unit) • C2 (Chemistry additional unit) 	<p><u>Topics Covered/ Areas of Focus:</u></p> <ul style="list-style-type: none"> • P2 (Physics additional unit) • Core and additional science control assessment (SCA) • Extension Revision and Exam preparation

Skills Development & Expected Progress:

Skills Development:

- plan practical ways to answer scientific questions and test hypotheses; devise appropriate methods for the collection of numerical and other data; assess and manage risks when carrying out practical work; collect, process, analyse and interpret primary and secondary data including the use of appropriate technology; draw evidence-based conclusions; evaluate methods of data collection and the quality of the resulting data.
- use models to explain systems and processes; develop arguments and explanations, and draw conclusions using scientific ideas and evidence
- communicate scientific information or ideas and scientific, technical and mathematical language, conventions and symbols
- represent chemical reactions by word equations and simple balanced equations where appropriate.

Expected Progress:

- They are encouraged to practise past exam papers independently and use 1-1 academic tutoring time effectively. Final exam entry decisions will be made in the Spring term of Yr11 based on Mock exam results and teacher assessments

Assessment:

Examination

All exams are linear, which means that students will sit exams at the end of Year 11. There will be regular testing and mock exams throughout the year including assessment

according to School Policy.

- Unit B1 (25%), Unit C1 (25%), Unit P1 (25%) and SCA (25%)
- Unit B2 (25%), Unit C2 (25%), Unit P2 (25%) and SCA (25%)

Science Controlled Assessment (SCA)

Students will be expected to complete 2 SCA's, one for each science award.

Controlled assessments are based on pre-released materials from the exam board. Students will have opportunity to do Practice Controlled Assessments (PCA) to prepare for the demands of the SCA. There are 3 parts; A, B and C. For Parts A and B students will be expected to formulate their own hypotheses, plan an experiment, make predictions and carry out their practical in a group or pair. They will need to take measurements and compare their primary data to secondary data. Part C is done under controlled conditions.

Literacy:

The GCSE course facilitates to develop strong literacy cognition within students. Students will:

- write legibly, with accurate use of spelling, grammar and punctuation, in order to make the meaning clear
- select and use a form and style of writing appropriate to purpose and to complex subject matter
- organise relevant information clearly and coherently, using specialist vocabulary when appropriate.

Numeracy:

The course has a strong numeracy basis. Biology, Chemistry and especially Physics have high levels of numeracy within them and any scientific experiment will involve the usage of data collection and analysis to draw conclusions. Students will:

- use numeracy in the precise measurements that lead them to the collection of good valid scientific data. This can be as simple as measuring the temperature of water correctly to more complicated data collection such as calculation the concentration of chemicals in chemistry titrations.
- then present this data in graphical form following numeracy rules on how to do so before using the graphical information to analyse data and identify patterns or trends within it and drawing conclusions.

ICT:

- The GCSE curriculum is based on around the Edexcel ActiveTeach which is a powerful electronic learning resource that combines innovative teaching materials with the flexibility and is used for front of class delivery and planning, with access for teachers. Our students can view the interactive eBook. The ActiveTeach includes an extension bank of captivating BBC video clips to help ensure that the lessons are more relevant from both perspectives of SMSC and from life in modern Britain.
- The ICT resources enable the teachers to provide a fully **differentiated and inspiring material** that allow students of all ability levels to reach their potential. We are expanding our ICT provision to fully incorporate it into the school VLE which can be accessed by home.

Life in Modern Britain:

The course provides ample opportunities to discuss and teach aspects of life in modern Britain. Instances include:

- *Criminal and Civil law:* themes - drug misuse, illegal hunting of endangered animals, pollution of protected ecosystems and environments.
- *Institution and services:* themes – discussion of local government policy with regards to issues such as limestone quarrying and other environmental issues.
- *Democracy and democratic values:* themes - development of socio-political policy to problems such as the greenhouse effect and acid rain through scientific guidance.
- *Individual liberty:* themes – promote dialogue and debate in issues such as stem cell research and genetic manipulation.
- *Respect and tolerance of multi-faith society:* themes – discussing the religious implications of bioethics and energy resources.

Safeguarding and resilience to propaganda: themes – critically analysing the misuse of science in history such as nuclear radiation.

SMSC:

The GCSE curriculum provides innumerable opportunities for students to progress in all aspects of spiritual, social, moral and cultural issues (SMSC). Examples of SMSC covered in the additional science:

- *Biology related themes:* such as ecosystems, human nutrition, stem cell and genetic research.
- *Chemistry related themes:* such as renewable resources, pollution in the environment, a focus on the development and misuse of drugs.

Physics related themes: such as the question of the origin of the universe, dangers associated to EMS especially ionising radiation such as Gamma ray.

Meeting the needs of individual students & Additional Support:

- Yr11 – Compulsory science extension
- Yr11 – Academic tutor one to one support during after school hours.
- Yr11 – Option/targeted 3 hour Saturday booster sessions with science teachers and academic tutors.
- Yr10 & Y11 - Logon science online resource used for homework and revision activities
- Yr10 - booster lessons

Extra-Curricular Activities & Club:

Activities include:

- The department is hoping to extend the after school 'Science Club' to Yr10 students and provide them the opportunity to work towards the BSA silver Crest award.
- Students have the opportunities to participate in STEM, G&T, university science seminars and workshops throughout the KS4 curriculum.

Independent Study/ Homework:

The course requires students to involve in independent studies on their own, outside of the classroom which is of crucial importance. It reinforces understanding, learning, and helps students to practice skills used in lessons. Moreover, it encourages creativity and promotes good independent and higher order learning skills such as analysis, evaluation and synthesis that are vital to future success. Students are required to do at least 3-4 hours of homework and revision a week.

Resources for Learning Support and VLE:**Book:**

- [1] Edexcel GCSE Science: *Science Student Book* - Author: Mark Levesley and others - ISBN: 9781846908897
- [2] Edexcel GCSE Science: *Additional Science Student Book* - Author: Mark Levesley and others - ISBN: 9781846908835
- [3] Edexcel GCSE Science: *Extension Units Student Book* - Author: Mark Levesley and others - ISBN: 9781846908866
- [4] Collins Revision - GCSEs Science and Additional Science Edexcel - ISBN: 978-0-00-741604-2

Websites:

Educational sites:

- [1] <http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/>
- [2] <http://www.s-cool.co.uk/gcse>

Specification and other material:

- [3] <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/science-2011-individual.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification-and-sample-assessments>

Exam material

- [4] <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/science-2011-individual.coursematerials.html#filterQuery=Pearson-UK:Category%2FExam-materials>