

KS4 Science

St Peter's Centre 2020-21



Biology, chemistry and physics should be studied in ways that help students to develop curiosity about the natural world, an insight into how science works and an appreciation of the relevance to their everyday lives. At St Peter's the students are taught the essential aspects of the knowledge, methods, processes and uses of science. The syllabus is compressed into a year for teaching as students are only with us for a year leading up to GCSE's.

In Biology we start with the cell biology topic as this review's previous knowledge from KS3 and builds on this. Cell structure, respiration and photosynthesis are biological concepts that will be needed in the rest of the course. The organisation topic concentrates on human anatomy and how the body works. Later topics build on this looking in more detail at hormones and the nervous system and genetics. Plant biology is covered in detail in the bioenergetics topic and the ecology topic looks at plants and animals and their place in the environment.

In Chemistry we start with the atomic structure and periodic table topic. This extends knowledge gained at KS3 and covers the basic concepts needed for the later topics in the chemistry course. Structure and bonding covered in the second topic is also needed to be able to access the concepts in later topics. Once the basics are understood the chemistry syllabus looks at chemical reactions, organic chemistry and chemistry of the atmosphere. The final topic shows how chemistry is useful to our everyday lives in areas such as water treatment and recycling.

The Physics syllabus is divided into more distinct topics and builds on many concepts that will have been met at KS3. The particle model of matter topic is taught first as it has the most fundamental ideas on how matter is arranged and why. It introduces density as a concept needed in other topics and how to use simple equations in calculations. The atomic structure topic is taught next as this introduces the concept of nuclear radiation which will be new to the students and it coincides with the atomic structure topic in chemistry which is also useful here. The other topics which include magnetism, forces, waves, energy and electricity all involve some mathematical ideas and the use of equations and by teaching these later in the course they will have covered algebra in maths which helps with understanding.

The schemes of work for the three subjects have been compressed to be covered in 39 lessons over the year. Time will need to be taken to complete assessments and homework tasks can extend the work covered in the lessons by looking at exam type questions and for further research.

AQA Combined Science GCSE Overview

Term	Biology	Chemistry	Physics
Summer 2 July	B1. Cell biology	C1 Atomic structure and the Periodic table	P3. Particle model of matter
Autumn 1 September – October	B1. Cell biology continued B2. Organisation	C2 Bonding, structure, and the properties of matter	P4. Atomic structure P7. Magnetism and electromagnetism
Autumn 2 November – December	B2. Organisation continued B3. Infection and response	C4. Chemical changes C3. Quantitative chemistry C5. Energy changes	P5. Forces
Spring 1 January – February	B4. Bioenergetics B5. Homeostasis and response	C6. The rate and extent of chemical change C7. Organic chemistry C8. Chemical analysis	P6. Waves P1. Energy
Spring 2 February – March	B6. Inheritance, variation and evolution B7. Ecology	C9. Chemistry of the atmosphere C10. Using resources	P1 Energy continued P2. Electricity
Summer 1 April – May	Revision and past papers	Revision and past papers	Revision and past papers

Exams

Paper	What is assessed?	How it is assessed?	Question types.
Biology Paper 1	Biology Topics 1 to 4: Cell Biology Organisation Infection and Response Bioenergetics	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.
Biology Paper 2	Biology Topics 5 to 7: Homeostasis and response Inheritance, variation and evolution Ecology	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.
Chemistry Paper 1	Chemistry topics 1–5: Atomic structure and the periodic table Bonding, structure, and the properties of matter Quantitative chemistry Chemical changes Energy changes	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.
Chemistry Paper 2	Chemistry topics 6–10: The rate and extent of chemical change Organic chemistry Chemical analysis Chemistry of the atmosphere Using resources	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.
Physics Paper 1	Physics topics 1–4: Energy Electricity Particle model of matter Atomic structure	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.
Physics Paper 2	Physics topics 5–7: Forces Waves Magnetism and electromagnetism	<ul style="list-style-type: none"> • Written exam: 1 hour 15 minutes • Foundation and Higher Tier • 70 marks • 16.7% of GCSE 	Multiple choice, structured, closed short answer, and open response.

