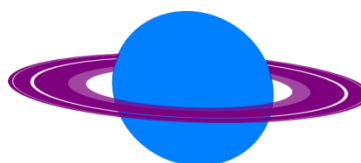




## Our Curriculum Aims:

- Satisfying a student's scientific curiosity and developing it further.
- Highlighting the importance of science and physics to society in the past, present and future.
- Preparing students with a solid foundation for the knowledge and skills required to enter a wide range of technical and scientific professions such as engineering and medical professions.
- Making students aware of the range of technical/ scientific professions available and what is needed to pursue those careers.
- Ensuring a firm knowledge base for the transition to the next Key Stage.
- Development of core scientific and analytical skills and scientific literacy that are essential for informed decision making regardless of career choice.
- Develop an understanding of the big issues in science that affect everybody such as nuclear power / renewable energy and global warming.
- Promoting equal opportunities.



## Year 9

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Space physics (KS3)	the solar system and the universe Gravity, orbital motion	Space test 1 prior to parents evening
HT 2		Seasons, Solar and lunar eclipses phases of moon	End of topic test late December
HT 3	Electricity and Static Electricity (KS4)	charge, current, voltage, Resistance Ohm's law Current-voltage characteristics of components	Electricity part 1 test at end of HT3
HT 4	Electricity and Static Electricity (KS4)	Power, Circuit theory, Domestic electricity	Electricity part 2 test at end of HT4
HT 5	Electricity and Static Electricity (KS4)	Static charge, electric fields  Density	Electricity end of topic test at end of HT3  <b>End of year 9 exam</b>
HT 6	Some parts of: Particle model of matter (KS4)	Heat transfer: Conduction, convection and radiation.	Topic test at end of HT6

### What can parents do to support their sons?

Parents can regularly check and monitor work set on 'Satchel one'. We have a list of resources that students and parents can use such as online Kerboodle and Seneca learning.

**GCSE Physics AQA ([Syllabus code 8463](#))**

## Choosing GCSE 'triple science' or Science 'dual award'

GCSE physics has a broader range of topics than the alternative Dual award physics. This is an advantage for those who wish to have a wider range of 'scientific literacy' and knowledge. It is also beneficial for those who wish go on to study A-level physics. Having said that, the disadvantage of having studied physics in dual award should not be seen as a serious impediment to A-level physics studies. If you take dual award you will be able to take an additional GCSE subject.

### All GCSE Physics students will study:

- Forces
- Energy
- Waves (sound and light)
- Electricity
- Magnetism and electromagnetism
- Particle model of matter
- Atomic structure (nuclear physics)
- Space physics

Dual award science (physics) students will study all of the above topics apart from Space physics. However, most of the topics in dual award are explored in less depth but at the same level of demand and difficulty.

## Key Stage Four Curriculum Overview

**Year 9:** Electricity KS4 – see information above

**year 10:**

	Name of topic	Key Content of the Topic	Assessment points
HT 1	<b>Energy</b>	Energy forms such as kinetic, gravitational potential energy, elastic potential energy. The concept of work done and energy transfers. The law of energy conservation. Power and efficiency.	Topic test: Energy part 1 at end of HT1.
HT 2	<b>Energy</b>	Thermal energy (internal energy). Specific heat capacity, specific latent heat. Changes of state. Energy resources.	End of topic test: mid-December
HT 3	<b>Forces</b>	Vectors and scalars Addition and resolution of vectors Gravity, resultant forces, Motion: kinematics and motion graphs.	Topic test: Forces part 1 at end of HT3
HT 4	<b>Forces</b>	Newton's three laws of motion. Pressure in fluids. Application of forces to stopping distances. Momentum. Moments, levers and gears.	End of topic test at end of HT4
HT 5	<b>Waves</b>	Wave properties, longitudinal and transverse waves, Electromagnetic waves spectrum. Sound waves in fluids and solids.	Waves test 1 at end of HT5
HT 6	<b>Waves</b>	Reflection and Refraction Lenses and ray diagrams Black body radiation	End of topic test at end of HT6

## Year 11:

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Electromagnetism	Permanent magnets, magnetic fields. Motor effect Motor Electromagnetic devices	Y11 trial exam mid-December
HT 2	Electromagnetism	Generator effect. AC generator and DC dynamo Transformers	End of topic test at end of HT 2
HT 3	Atomic structure	The atom, Radioactivity – properties of alpha, beta and gamma Half-life Use of radioisotopes in industry and medicine Nuclear power, fission and fusion	End of topic test at end of HT3
HT 4	Space physics	Red shift, Big bang, satellites, orbits, life cycle of stars.	End of topic test at end HT4
HT 5	Revision		
HT 6	NA		GCSE exams

### Recommended Revision Guides for GCSE

**Online textbook** (which includes revision material) available via 'Kerboodle' login. A range of **Revision guides** and **workbooks** are recommended to students and parents. E.g. **Grade 8-9 booster book** from cgp. Various **past examination questions** are to be found on the Office 365 group 'STU physics GCSE'. We also recommend the sample AQA exam paper packs from CGP, Collins and Letts. The specification should be used as a comprehensive revision list: <http://filestore.aqa.org.uk/resources/physics/specifications/AQA-8463-SP-2016.PDF>

### Support available for GCSE Students

All pupils are invited to **mentoring sessions**; these are held by sixth form mentors on Tuesday and Thursday lunchtimes (12.20-13.00). Pupils are encouraged to **ask their teachers** for additional assistance and can work in the department at any time.

## Key stage 5 Physics curriculum overview

The course is AQA A-level physics 7408 and the specification and other resources can be found on the AQA web site: [AQA | Science | AS and A-level | Physics](#)

The course includes twelve required practicals (RP). The students have a single laboratory book in which they write up all twelve practicals. Students who consistently display the appropriate standards receive a 'practical endorsement' which appears on their A-level certificate. The practicals are judged according to a set of criteria but no grades are awarded for them and they do not count towards the final grade.

There are three exam papers at the end of year 2, the third one has some questions on practical skills and methods. Some of these questions may relate to the required practicals.

We include many other experiments in the course that are just as valuable educationally as the required practicals and AQA expect all schools to be doing this.

There are five possible optional topics. However, we know from experience that we get the best grades if all students in a class study the same topic with a teacher who has experience of teaching that topic. For this reason, each class is presented with a choice of typically Astrophysics or Engineering Physics. We will do the topic that the majority are in favour of. Most schools/colleges do not give students a choice.

In the sixth form we ask all students to purchase copies of the Collins AQA A level Physics texts books for year 1 and year 2. The books are well written and contain a significant amount of background and historical information that puts the examinable material in context.

The students also have access to Kerboodle online which has a number of questions with model answers. Most students will obtain a copy of the CGP revision guide/ workbook for A-level AQA physics. We recommend this for exam revision as it concentrates only on the examinable material.

In the physics department we are moving towards a minimal use of paper. For this reason we ask students to equip themselves with a suitable computer with which they are able to write with a stylus. We have a limited number of ipads for students who do not have a device.

Support is available from teacher during lunchtimes upon request. From March to May in year 13 we have lunchtime sessions where students are given past paper questions and we then go through model answers. Year 13 physics prefects are also available to assist year 12 students.

In the sixth form we always have two teachers assigned to a group. For timetabling reasons, the lesson splits can vary between groups. For instance, a year 12 group may have six lessons per fortnight with one teacher and four with the other. Several examples are given below.

Curriculum plan		Y12 6/4 split	
Teacher 1	4 lessons	Teacher 2	6 lessons
		weeks	weeks
<b>PARTICLES</b> Standard model, Hadrons, mesons (pions and kaons) , baryons, quarks, leptons, Conservation laws, Interactions: weak interaction, strong interaction (12) <b>Test</b>	6	Measurements/ errors: SI units (2) <b>MECHANICS:</b> Vectors, graphs, suvat (12) (RP3 – freefall g)* *Measurements / errors: graphing, estimating uncertainties, error bars. Add absolute uncertainties when 2 metre rules used to measure drop height. (4) <b>Test 1</b>	6
Half term Break up October		Half term Break up October	

<b>QUANTUM:</b> Photo Electric effect (2) spectra, De Broglie (6) <b>MATERIALS:</b> Hooke's law, Young modulus* *Measurements / errors: combining uncertainties e.g.in a YM calculation add % (8)	8	<b>MECHANICS:</b> Moments Newton's laws Momentum (24) <b>Test 2</b>	8
<b>Xmas</b>			
<b>MATERIALS:</b> <b>(RP4 Young modulus) (4) Test</b> <b>ELECTRICITY:</b> Current and charge Emf and potential difference ohm's law, I-V graphs, circuit analysis (6)	5	<b>WAVES:</b> Refraction, optical fibres single slit (13) Double slit theory Diffraction gratings theory (15)	5
Half term: February			
<b>Topic tests on Mechanics, Particles, Quantum, materials, Electricity part 1, waves part 1 completed prior to March parents evening/ data</b>			
<b>ELECTRICITY:</b> Internal resistance Resistivity LDR / thermistor - potential dividers (12)	6	<b>WAVES:</b> Superposition, standing waves (18) <b>Test</b>	6
EASTER March / April			
<b>END OF YEAR EXAMS April</b>			
<b>ELECTRICITY:</b> <b>(RP6 internal resistance)</b> <b>(RP5 resistivity) (10) Test</b>	6	<b>WAVES:</b> <b>RP2 (a) Young's slits, RP2 (b) gratings</b> <b>(RP1 standing waves) (10) Test</b>	6
<b>Y2: THERMAL SECTIONS 3.1 - 3.4 ONLY</b> shc, latent heat (2)		<b>Y2: CIRCULAR MOTION* (8)</b>	
(Half term: May/June)			
<u>Empirical</u> gas laws <b>(RP8 Boyle, Charles).</b> Pressure law (CVGT). (10) TEST	5	<b>SHM* (RP7 SHM)</b> <b>DAMPING AND RESONANCE * (15)</b> <b>*STANDARD TESTS MUST BE DONE</b>	5
<b>End of term July</b>			

Curriculum plan	Y12	5/5 split			
Teacher 1	5	wee ks	Teacher 2	5	we eks
<b>PARTICLES</b> Standard model, Hadrons, mesons (pions and kaons) , baryons, quarks, leptons, Conservation laws, Interactions: weak interaction, strong interaction (12)  <b>QUANTUM:</b> Photo electric effect (2)		7	Measurements/ errors: SI units (2) <b>MECHANICS:</b> Vectors, graphs, suvat (12) <b>(RP3 – freefall g)*</b> *Measurements / errors: graphing, estimating uncertainties, error bars. Add absolute uncertainties when 2 metre rules used to measure drop height. (4) <b>Test 1</b>		7
Half term Break up October			Half term Break up October		
spectra, De Broglie equation (6)  <b>MATERIALS:</b>		7	<b>MECHANICS:</b> Moments Newton's laws		7

Hooke's law, Young modulus* *Measurements / errors: combining uncertainties e.g.in a YM calculation add % (8)		Momentum (17) <b>Test 2</b>	
<b>Xmas</b>			
<b>MATERIALS:</b> (RP4 Young modulus) (4) <b>Test</b>	5	<b>WAVES:</b> Refraction, optical fibres single slit (13) Double slit theory Diffraction gratings theory (15)	5
<b>ELECTRICITY:</b> Current and charge Emf and potential difference ohm's law, I-V graphs, circuit analysis (6)			
Half term: February			
<b>Topic tests on Mechanics, Particles, Quantum, materials, Electricity part 1, waves part 1 completed prior to parents evening/ data in March</b>			
<b>ELECTRICITY:</b> Internal resistance Resistivity LDR / thermistor - potential dividers (12)	6	<b>WAVES:</b> Superposition, standing waves (18)	6
EASTER March / April			
<b>END OF YEAR EXAMS April</b>			
<b>ELECTRICITY:</b> (RP6 internal resistance) (RP5 resistivity) (10) <b>Test</b>	6	<b>WAVES:</b> RP2 (a) Young's slits, RP2 (b) gratings (RP1 standing waves) (10) <b>Test</b>	6
<b>Y2: THERMAL SECTIONS 3.1 - 3.4 ONLY</b> shc, latent heat (2)		<b>Y2: CIRCULAR MOTION* (8)</b>	
(Half term: May/June)			
<u>Empirical</u> gas laws (RP8 Boyle, Charles). Pressure law (CVGT). (10) <b>TEST</b>	5	<b>SHM* (RP7 SHM)</b> <b>DAMPING AND RESONANCE * (15)</b> *STANDARD TESTS MUST BE DONE	5
<b>End of term July</b>			

Y13 curriculum plan 6 / 3 split			
<b>Teacher 1: 6 lessons</b>	<b>Weeks (LESSONS)</b>	<b>Teacher 2: 3 lessons</b>	<b>Weeks (LESSONS)</b>
<b>GRAVITATIONAL FIELDS</b> Newton's law of gravitation Gravitational field strength Gravitational potential <b>Test Gravitational fields</b>	6 (18)	<b>THERMAL:</b> SECTION 3.5 ONWARDS Ideal gasses Kinetic theory	6(9)
Half term Break-up October			
<b>ELECTRIC FIELDS</b> Coulomb's law Electric field strength Electrical potential <b>Test electric fields</b>	6 (18)	<b>THERMAL</b>  <b>Test all of thermal</b>	6(9)

PARENTS EVE / DATA December			
<b>MAGNETIC FIELDS</b> F=BIL, F= BQV Flux linkage Induction AC	2(6)	<b>NUCLEAR</b> Properties of nuclear radiation Inverse Square law RP Radioactive decay	2(3)
<b>Xmas</b>			
<b>MAGNETIC FIELDS</b> Transformers F=BIL RP search coil RP	2 (6)	<b>NUCLEAR</b> Nuclear fission / fusion <b>Test</b> <b>CAPACITORS</b> Capacitor charging and discharging	2(3)
<b>EXAMS - late Jan/ early Feb</b>			
<b>MAGNETIC FIELDS</b> F=BIL RP Search coil RP Test	1(3)	<b>CAPACITORS:</b> capacitor RP <b>Test</b>	1(1)
Half term February			
<b>OPTION: Engineering / Astrophysics</b>	6 (18)	<b>Revision and exam practice</b>	6(9)
<b>EASTER March/April</b>			
<b>Revision and exam practice</b>	4 (12)	<b>Revision and exam practice</b>	4(6)
Study leave mid-May			