

Physics in the Sixth Form is both exciting and challenging. Invaluable skills such as problem solving, practical work, ICT (Information and Communications Technologies), communication of ideas, mathematical application and self-study are all developed due to the variety of activities and teaching methods. These skills mean that Physics qualifications are recognised and respected as sound preparation for many scientific and non-scientific careers. In addition, Physics forms a firm basis for further study in areas such as sciences, engineering, architecture, meteorology and medicine, as well as indirectly in other areas such as law and accountancy.

The Course

We follow the **AQA Syllabus A** for Physics which offers a broad foundation in the subject which will equip students for further study at university in **physics** or **engineering** as well as a range of other professional courses.

AS physics consists of three units:

- **Module 1** In this module students unpick the atom and discover that protons and neutrons are made out of smaller particles called quarks. They look at particle accelerators and investigate the weird and wonderful particles produced in them, which help physicists to find out what it was like in the first few milliseconds after the "big bang" (the birth of our Universe). They also investigate how objects emit light and what happens as light is transmitted and absorbed by matter.
- **Module 2** In this module students develop their knowledge of dynamics (motion of objects) through applications such as sprinting, rock climbing, ski-jumping, basket ball and javelin throwing. They apply Newton's laws of motion to free fall, car crashes, rockets, tennis and cricket. Much ICT is used in this module to collect data on the motion of an object, using both motion sensors and video. This unit also looks at the behaviour of gasses as they are heated, focusing particularly on the movement of the molecules themselves.
- **Module 3** In this module students build on GCSE ideas of electricity and investigate the problems of powering satellites in space. They also investigate how materials behave under stress (stretched), focusing on metals, plastics and hip replacement material.

How will students be assessed?

Students will be assessed with three 1 hour written exams linked to each module as well as a practical exam. We start with Module 2 so they will have the opportunity to take the Module 2 exam in January. There module 3 exam is linked with the results from the practical exam to give an overall UMS mark of 120.

PA1	PA2	PA3/W		PA3/P
Module 1 Particles, Radiation and Quantum Physics	Module 2 Mechanics and Kinetic Theory of Gases	Module 3 Electricity and Properties of Materials	+	Practical exam planning (8 marks) practical experiment (22 marks)
8 June 2007 (1 hour)	12 January 2007 (1 hour)	8 June 2007 (1 hour)		16 May 2007 (1h 45m)
30%	30%	25%		15%
90 UMS marks	90 UMS marks	120 UMS marks		

What students should expect from the course and us:

- An exciting course which supports them in achieving their full potential.
- Regular homework will be set, once a week and marked within a week.
- Two drop in lunchtime sessions a week on Wednesdays and Fridays to help students with any areas they are finding difficult.
- A tick list for each unit box, in more detail than the syllabus. So students can track progress through the unit.
- Worked answers to all problem sheets, so answers can be checked.
- Numerous past paper questions sorted into topics. Cross-referenced to the Paper and year so they can refer to the mark schemes.
- Set regular progress tests to monitor their understanding of new ideas.
- Maintain a record with each student that tracks test marks, goals and target grades.
- Make available revision guides for both AS and A2 at a cost of £5

What we should expect from physics students:

- Dedication to do their very best and fulfil your potential.
- Take responsibility for their own learning. Seek help and inform us if they do not understand any part of the topic. Use the lunchtime one to one sessions to help.
- Attend lessons promptly so we can start quickly and make the maximum use of the time allocated.
- Competing all work set to the best of their ability.
- Meet deadlines for work.
- Be organised and keep you notes and files up to date and complete.
- Read through the relevant parts of the textbook in your own time to support your leaning in class.

Other Information

Last year the Physics department achieved excellent results. We had a 100% pass rate at both A2 and AS with 78% of students achieved a grade C or above in A2 and 63% of students achieved a grade B or above in AS.

A level Physics is an excellent qualification, which allows students to access a wide variety of higher education courses and careers.

The two AS and A2 teachers in physics are Mr Boddaert (Head of Physics) and Mr Kitley. If you would like to contact us at any time on your son/daughters progress in Physics then please either phone the school or alternatively e-mail us at dboddaert@westberks.org or rkitley@westberks.org

Also there is further information on the Physics website through www.littleheath.org.uk

AS Qualifications

Exam	Information	Date of exam	Weighting
<p>Unit 1 (PSA1) (36 lessons)</p>	<p>Particles (RKI) Constituents of the atom Evidence for existence of the nucleus, qualitative study of Rutherford scattering Particles, antiparticles and photons Classification of particles Quarks and antiquarks</p> <p>Electromagnetic radiation and quantum phenomena (DBO) Refraction at a plane surface The photoelectric effect Collisions of electrons with atoms Ionisation, excitation Energy levels, photon emission Wave-particle duality</p>	<p>8 June 2007 (1 hour)</p>	<p>30%</p>
<p>Unit 2 (PSA2) (36 lessons)</p>	<p>Mechanics Scalars and vectors (RKI) Conditions for equilibrium for two or three coplanar forces acting at a point (RKI) Turning effects (RKI) Displacement, speed, velocity and acceleration (DBO) Uniform and non-uniform acceleration, representation and interpretation by graphical methods (DBO) Independence of vertical and horizontal motion (projectiles) (DBO) Momentum, conservation of linear momentum (RKI) Newton's laws of motion (RKI) Work, energy, power (RKI) Conservation of energy (RKI) Calculations involving change of energy (RKI)</p> <p>Molecular Kinetic Theory (DBO) Specific Heat capacity and latent heat The equation of state for an ideal gas The molar gas constant R, The Avogadro constant N_A Pressure of an ideal gas Internal energy Relation between temperature and molecular kinetic energy. The Boltzmann constant</p>	<p>12 January 2007 (1 hour)</p>	<p>30%</p>
<p>Unit 3 (PSA3/W) (36 lessons)</p>	<p>Current electricity Charge, current, potential difference (DBO) Resistance, Current/voltage characteristics, Ohm's law (DBO) Resistivity (DBO) Series and parallel resistor circuits (DBO) Energy and power in d.c. circuits (DBO) Kirchhoff's laws (DBO) Potential divider (DBO) Electromotive force E, Internal resistance r (RKI) Alternating currents, Oscilloscope (RKI)</p> <p>Elastic properties of solids Bulk properties of solids (RKI) The Young modulus (RKI)</p>	<p>8 June 2007 (1 hour)</p>	<p>25%</p>
<p>Unit 3 (PSA3/P)</p>	<p>Practical exam 1) planning 8 marks, 2) practical experiment 22 marks)</p>	<p>16 May 2007 (1h 45m)</p>	<p>15%</p>
			<p>100%</p>

Teaching schedule for AS Units

100 lessons available for teaching students. (+ about 6 extra)

Module 2 → Module 3 → Module 1

Module(including extra practical exam practice (RKI))

Module	DBO	RKI
1		
Mock for PSA2 Start of the last week before Christmas holidays.		
PSA2 exam 12 January (am)		

Integration of practical exam practice

DBO	RKI
Interference/Diffraction Jan 2002 Standing waves practical June 2002 Planning (Coloured filters/ spectrometer)	Oscillations June 2002 Qu 2 V-shaped pendulum Jan 2003 Compound Pendulum
Magnetic effects of currents Jan 2004 planning Jan 2003 planning (can do experiment! next lesson)	Gravity Jan 2005 Planning
	Capacitance June 2003 Qu 2 Discharging Capacitors

