

Switching to AQA from OCR A and Additional Science (Physics components)

If you're thinking of switching to AQA from OCR Science A and Additional Science (J241 and J242) for teaching from September 2016, this resource will provide a helpful comparison of the subject content and assessment for each awarding body.

It directly compares the Physics components of the current OCR 21st Century Science A and Additional Science A (J241 and J242) with the Physics component of the new AQA GCSE Combined Science: Trilogy specification (8464).

The subject content and required practicals for the GCSE Combined Science: Trilogy are also in the GCSE Physics specification, so there is the flexibility to co-teach or to move students between courses.

Comparison overview

OCR

The OCR specification is modular to fit the three exam papers for each GCSE with the additional Controlled Assessment modules.

AQA

The AQA specification has broad themes, each with an introductory context and is intended to build a deep understanding of science. It is possible to take differing routes through the specification to engage and enthuse students.

Assessment

New AQA specification	Current OCR specification
Two externally assessed written papers (1 hour 15 minutes).	Science A: three externally assessed written papers (1 hour)
Paper 1 assesses sections 6.2, 6.4, 6.6 and 6.7	One is Physics plus controlled assessment.
Paper 2 assesses 6.1, 6.3 and 6.5.	Additional Science A: three externally assessed written papers (1 hour)
Five required practicals should be carried out by students and may be examined in the written papers to	One is Physics plus controlled assessment.

assess practical skills.	There are no mixed papers.
The required practicals are clearly listed, as are opportunities for development of skills identified in the right-hand column of the specification. These should encourage more practical work which will motivate students and encourage the transfer of skills across the subject.	Science: the Controlled Assessment comprises two elements: A Case Study and a Practical data analysis task (25%). Additional Science: one element: a Practical investigation (25%). Each of the units has suggestions for practical work.
The content is organised into seven topics: 1. Forces 2. Energy 3. Waves 4. Electricity 5. Magnetism and electromagnetism 6. Particle model of matter 7. Atomic structure	In each Specification, the content is organised into three units, each covering three modules. Science: P1 The Earth in the Universe P2 Radiation and life P3 Sustainable energy Additional Science: P4 Explaining motion P5 Electric currents P6 Radioactive materials

Content

Working scientifically

New AQA specification	Current OCR specification
Specification reference: WS 1.1 to WS 4.6	Specification references: Ideas about science Controlled assessment tasks (Internal assessment)

<p>'Working Scientifically' is the sum of all the activities that scientists do and is woven throughout the specification and written papers. There are cross-references to relevant activities in the content.</p> <p>The compulsory practicals are listed in 10.2, together with the relevant Physics techniques. They are integrated into the content specification. Overall, questions based on these activities will count for at least 15% of the overall marks.</p> <p>The use of apparatus and techniques specific to physics are listed in 10.1 AT 1 - AT 7.</p>	<p>This specification has interpreted the principles of 'How science works' into a series of Ideas about Science and consider causes and effects, theories and science and society. Each module overview identifies relevant issues. Including opportunities for practical work, mathematics and ICT.</p> <p>Controlled assessments contribute 25% of the total marks.</p>
<p>Unit content identifies opportunities for skill development throughout with references to WS, MS (Mathematical requirements) (9) and Use of apparatus and techniques (10.1).</p> <p>12 Appendix B lists Physics equations</p>	<p>Mathematical skills are listed in Appendix B.</p> <p>Appendix C lists physical quantities and units but not equations.</p> <p>Appendix E lists electrical symbols.</p>

Forces

6.1 Forces

New AQA specification	Current OCR specification
<p>Specification reference: 6.1.1.1 to 6.1.5.2</p>	<p>Specification reference: P4: Explaining motion</p>
<p>Scalar and vector quantities, types of forces; gravity and weight; resultant forces; work done and energy transfer; forces and elasticity; forces and motion; Newton's laws and their applications; momentum.</p>	<p>Specification reference:</p> <ul style="list-style-type: none"> • P4:1.1 to 1.8 Speed and acceleration • P4:1.10 to 1.13 Velocity-time graphs • P4:2.1 to 2.9 forces, friction and resultant forces • P4:3.1 to 3.3 Resultant forces

	<ul style="list-style-type: none"> • P4:3.6 to 11 Momentum • P4:4.1 to 10, 4.13, 4.14 Kinetic energy and work done; conservation of energy.
<p>Required practicals:</p> <p>6.1.3: Investigate the relationship between force and extension for a spring.</p> <p>6.1.6.2.2: Investigate the effect of varying the force and/or mass on the acceleration of an object.</p>	N/A

6.2 Energy

New AQA specification	Current OCR specification
<p>Specification reference:</p> <p>6.2.1.1 to 6.2.3</p>	<p>Specification reference:</p> <p>P3 Sustainable energy</p>
<p>Energy stores and systems; changes in energy, energy changes in systems; work, power, efficiency, conservation and dissipation of energy; national and global energy resources.</p> <p>These AQA topics are not covered in OCR:</p> <ul style="list-style-type: none"> • Energy stores and systems • Changes in energy • Energy changes in systems 	<p>Specification reference:</p> <ul style="list-style-type: none"> • P3:1.1 to 1.3 Sources of energy • P3:1.5 to 1.7 Energy, current and power • P3: 1.13 Efficiency equation • P3:1.14 Reduction of energy usage <p>In OCR but are not specified in AQA:</p> <ul style="list-style-type: none"> • P3.1 Sankey diagrams; $P = VI$ is in AQA 4.4 • P3.3 Choices of energy sources
<p>Required practical:</p> <p>6.2.1.3: Investigate the specific heat capacity of one or more materials.</p>	

6.3 Waves

New AQA specification	Current OCR specification
<p>Specification reference: 6.3.1.1 to 6.3.2.4</p>	<p>Specification reference:</p> <ul style="list-style-type: none"> • P1 The Earth in the Universe • P2 Radiation and Life
<p>Transverse and longitudinal waves, properties of waves; types, properties and uses of electromagnetic waves.</p> <p>In AQA but not specified in OCR:</p> <ul style="list-style-type: none"> • Transverse and longitudinal waves, properties of waves, reflection of waves; sound waves; 	<p>Specification reference:</p> <ul style="list-style-type: none"> • P1:2.17 The wave equation • P1:2.19 to 2.25 Properties of waves • P2:1.4 to 1.6 Electromagnetic spectrum <p>In OCR but not specified in AQA:</p> <ul style="list-style-type: none"> • P1.2 Wegener's theory; tectonic plates and the rock cycle. • P2.1 Use of the term 'photon' • P2.2.8-9 The ozone layer • P2.3 Global warming • P2.4.2-12 Details of analogue/digital information transmission

6.4 Electricity

New AQA specification	Current OCR specification
<p>Specification reference: 6.4.1.1 to 6.4.4.3</p>	<p>Specification reference: P5 Electric circuits</p>

<p>Electrical charge, current, resistance, potential difference, resistors; series and parallel circuits; direct and alternating current; mains electricity, fuses, insulation and circuit breakers; power, energy transfers in everyday devices.</p> <p>A table of standard circuit symbols is provided (6.4.1.1).</p>	<p>Specification reference:</p> <ul style="list-style-type: none"> • P5 1.5 to 1.6 Charge and current • P5:1.11 Use of ammeter • P5 2.1 to 2.3 Resistance and voltage • P5:2.6 to 2.7 Power, voltage and current • P5:210 to 2.16 Resistance in different components • P5 3.1 to 3.7 Voltage in a circuit • P5:4 .14 to 4.17 Direct and alternating current <p>Standard circuit symbols are given in Appendix E.</p>
<p>Required practicals:</p> <p>6.4.1.3: Investigate, using circuit diagrams to set up a circuit, the factor(s) that affect the resistance of an electrical component.</p> <p>6.4.1.4: Investigate, using circuit diagrams to construct circuits, the V-I characteristics of a filament lamp. A diode and a resistor at constant temperature.</p>	<p>N/A</p>

6.5 Magnetism and electromagnetism

New AQA specification	Current OCR specification
<p>Specification reference:</p> <p>6.5.1.1 to 6.5.2.3</p>	<p>Specification reference:</p> <ul style="list-style-type: none"> • P3 Sustainable energy • P5 Electric circuits
<p>Poles of a magnet, magnetic fields, electromagnetism, solenoids; Fleming's left-hand rule, electric motors.</p> <p>Not specified by OCR: Fleming's left-hand rule; loudspeakers, microphones</p>	<p>Specification reference:</p> <ul style="list-style-type: none"> • P3 2.4 to 2.12 Details of electricity generation, including from various sources

	<ul style="list-style-type: none"> • P5 4.1 to 4.5 Electromagnetic induction of
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6.6 Particle model of matter

New AQA specification	Current OCR specification
Specification reference: 6.6.1.1 to 6.6.3.1	Specification reference: Physics only
Changes of state, density of materials; internal energy, specific heat capacity and temperature changes in a system, specific latent heat; particle motion in gases, pressure in gases.	N/A
Required practical: 6.6.1.1: Investigate using appropriate apparatus, the densities of regular and irregular solid objects and liquids, making and recording appropriate measurements.	N/A

6.7 Atomic Structure

New AQA specification	Current OCR specification
Specification reference: 6.7.1.1 to 6.7.2.4 6.7.1.1 to 3 (Structure of an atom) is common content with Chemistry 5.1.1.3 to 6	Specification reference: <ul style="list-style-type: none"> • P2 Radiation and Life (2.10 to 2.12) (ionisation only) • P3 Sustainable energy • P6 Radioactive materials
Structure of an atom, mass number, atomic number, isotopes; the development of the model of the atom; radioactive decay and nuclear radiation; nuclear equations; half-lives; radioactive contamination.	Specification reference: <ul style="list-style-type: none"> • P2 2.6, 2.7 Gamma radiation • P3 2.9, 2.10 Radioactive contamination and cancer • P6 1.1 to 1.4 Radioactivity and the structure of the atom • P6:1.8 to 1.17 Properties of radioactive substances; half-life • P6 2.1 to 2.9 Uses and risks of

	<p>radioactive substances</p> <p>In OCR but not specified in in AQA:</p> <p>P2.1.7 to 9 Intensity of radiation</p>
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New AQA Specification	Current OCR Specification
N/A	<p>P1: The Earth in the Universe:</p> <p>1.1 Space science</p> <p>1.2 Geology elements</p>
N/A	<p>P2: Radiation and Life:</p> <p>2.2 Damage caused by e-m waves</p> <p>2.3 Global warming</p> <p>2.4 Details of communications using electromagneticwaves</p>
N/A	<p>P3: Sustainable energy:</p> <p>3.2 Details of electricity generation</p> <p>3.3 Details of energy sources</p>