



## Physics Department – Curriculum Intent

January 2026

### Overview of KS4 Curriculum - Physics

**Subject: GCSE Physics (Triple) Exam Board: AQA Head of Department: Mr R Murray**

	Year 9	Year 10	Year 11
<b>Autumn Term</b>	<p>All students begin learning GCSE Physics content in Year 9. Only topics common to both the Combined and Triple Science pathways are taught in Year 9. Students select which science pathway they wish to pursue at GCSE in Year 10</p> <p>Working Scientifically 1 – SI Units, prefixes and formulas            Working Scientifically 2 – Investigating weight and mass            Working Scientifically 3 – Investigating Hooke’s Law 1            Working Scientifically 4 – Investigating Hooke’s Law 2            Working Scientifically 5 – Investigating Density Lesson 1            Working Scientifically 6 – Investigating Density Lesson 2  <b>Working Scientifically – Assessment</b></p> <p>P1.1 Changes in energy Stores            P1.2 Conservation of Energy            P1.3 Energy and Work            P1.4 Gravitational Potential Energy stores            P1.5 Kinetic Energy and Elastic Energy Stores            P1.6 Energy Dissipation</p>	<p>P4.1 Electrical charges and fields            P4.2 Current and Charge            P4.3 Potential Difference and Resistance            P4.4 Component Characteristics            P4.5 Series Circuits            P4.6 Parallel Circuits  <b>Chapter 4 Assessment</b></p> <p>P5.1 Alternating Current            P5.2 Cables and Plugs            P5.3 Electric power and Potential difference            P5.4 Electrical currents and energy transfer            P5.5 Appliances and efficiency  <b>Chapter 5 Assessment</b></p> <p>P6.1 Density            P6.2 States of Matter            P6.3 Changes of State            P6.4 Internal energy            P6.5 Specific latent Heat            P6.6 Gas Pressure and Temperature            P6.7 Gas Pressure and Volume  <b>Chapter 6 Assessment</b></p> <p><b>Career Links:</b>            Electrical Engineer, Electrician, Telecommunications, Gas Engineer</p>	<p>P11.1 Pressure and surfaces            P11.2 Pressure in a liquid at rest            P11.3 Atmospheric pressure            P11.4 Upthrust and flotation  <b>Chapter 11 Assessment</b></p> <p>P12.1 The nature of waves            P12.2 The properties of waves            P12.3 Reflection and refraction            P12.4 More about waves            P12.5 Sound Waves            P12.6 The uses of ultrasound            P12.7 Seismic Waves  <b>Chapter 12 Assessment</b></p> <p>P13.1 The electromagnetic spectrum            P13.2 Light, Infrared, microwaves and radiation            P13.3 Communications            P13.4 Ultraviolet waves, X-rays and Gamma rays            P13.5 X- rays in Medicine  <b>Chapter 13 Assessment</b></p> <p><b>Career Links:</b>            Radiologist, Radiographer, Medicine, Midwife</p>



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<b>Spring Term</b>	<p>P1.7 Energy and efficiency P1.8 Electrical appliances P1.9 Energy and Power <b>Chapter 1 Assessment</b></p> <p>P2.1 Energy Transfer by conduction P2.2 Infrared radiation P2.3 More about infrared radiation P2.4 Specific Heat Capacity P2.5 Heating and insulating buildings <b>Chapter 2 Assessment</b></p>	<p>P7.1 Atoms and Radiation P7.2 The Discovery of the Nucleus P7.3 Changes in the nucleus P7.4 More about Alpha, Beta and Gamma Radiation P7.5 Activity and Half Life P7.6 Nuclear radiation in medicine P7.7 Nuclear fission P7.8 Nuclear Fusion P7.9 Nuclear issues <b>Chapter 7 Assessment</b></p> <p><b>Career Links:</b> Nuclear Physicist, Radiologist, Carbon Dating</p> <p>P8.1 Vectors and Scalars P8.2 Forces between Objects P8.3 Resultant Forces P8.4 Moments at work P8.5 More about levers and Gears P8.6 Centre of mass P8.7 Moments and equilibrium P8.8 The parallelogram of forces P8.9 Resolution of Forces <b>Chapter 8 Assessment</b></p> <p><b>Career Links:</b> Mechanical Engineer, Mechanic, Pilot,</p>	<p>P14.1 Reflection of Light P14.2 Refraction of Light P14.3 Light and colour P14.4 Lenses P14.5 Using Lenses <b>Chapter 14 Assessment</b></p> <p><b>Career Links:</b> Optometrist, Lighting Engineer</p> <p>P15.1 Magnetic Fields P15.2 Magnetic Fields of electric currents P15.3 Electromagnets in devices P15.4 The motor effect P15.5 The generator effect P15.6 Alternating – current generator P15.7 Transformers P15.8 Transformers in action <b>Chapter 15 Assessment</b></p> <p>P16.1 Formation of the Solar system P16.2 The life history of a star P16.3 Planets, satellites and orbits P16.4 The expanding Universe P16.5 The beginning and Future of the Universe</p> <p><b>Career Links:</b> Astrophysicist, Electrical Engineer</p>
<b>Summer Term</b>	<p>P3.1 Energy Demands P3.2 Energy from wind and water P3.3 Power from the Sun and the Earth P3.4 Energy and the environment P3.5 Big Energy issues <b>Chapter 3 Assessment</b></p> <p><b>Career Links:</b> Careers linked to the energy industry (power stations, green energy technologies), building surveyors.</p>	<p>P9.1 Speed and Distance- Time Graphs P9.2 Velocity and Acceleration P9.3 More about velocity – time graphs P9.4 Analysing Motion Graphs <b>Chapter 9 Assessment</b></p> <p>P10.1 Forces and Acceleration P10.2 Weight and Terminal Velocity P10.3 Forces and Braking P10.4 Momentum P10.5 Using conservation of momentum P10.6 Impact Forces</p>	<p>Chapter 16 Assessment Revision</p>



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		P10.7 Safety First P10.8 Forces and Elasticity <b>Chapter 10 Assessment</b>	
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### Overview of KS4 Curriculum

**Subject: GCSE Physics (Combined)      Exam Board: AQA**

	Year 9	Year 10	Year 11
<b>Autumn Term</b>	<p>All students begin learning GCSE Physics content in Year 9. Only topics common to both the Combined and Triple Science pathways are taught in Year 9. Students select which science pathway they wish to pursue at GCSE in Year 10</p> <p>Working Scientifically 1 – SI Units, prefixes and formulas            Working Scientifically 2 – Investigating weight and mass            Working Scientifically 3 – Investigating Hooke’s Law 1            Working Scientifically 4 – Investigating Hooke’s Law 2            Working Scientifically 5 – Investigating Density Lesson 1            Working Scientifically 6 – Investigating Density Lesson 2  <b>Working Scientifically – Assessment</b></p> <p>P1.1 Changes in energy Stores            P1.2 Conservation of Energy            P1.3 Energy and Work            P1.4 Gravitational Potential Energy stores            P1.5 Kinetic Energy and Elastic Energy Stores            P1.6 Energy Dissipation</p>	<p>P4.1 Current and Charge            P4.2 Potential Difference and Resistance            P4.3 Component Characteristics            P4.4 Series Circuits            P4.5 Parallel Circuits  <b>Chapter 4 Assessment</b></p> <p>P5.1 Alternating Current            P5.2 Cables and Plugs            P5.3 Electric power and Potential difference            P5.4 Electrical currents and energy transfer            P5.5 Appliances and efficiency  <b>Chapter 5 Assessment</b></p> <p><b>Career Links:</b>            Electrical Engineer, Electrician, Telecommunications, Gas Engineer</p>	<p>P10.1 Forces and Acceleration            P10.2 Weight and Terminal Velocity            P10.3 Forces and Braking            P10.4 Momentum            P10.5 Forces and Elasticity  <b>Chapter 10 Assessment</b></p> <p>P11.1 The Nature of Waves            P11.2 The Properties of Waves            P11.3 Reflection and Refraction            P11.4 More about waves  <b>Chapter 11 Assessment</b></p> <p><b>Career Links:</b>            Optometrist, Lighting Engineer</p>
<b>Spring Term</b>	<p>P1.7 Energy and efficiency            P1.8 Electrical appliances            P1.9 Energy and Power  <b>Chapter 1 Assessment</b></p> <p>P2.1 Energy Transfer by conduction            P2.2 Infrared radiation            P2.3 More about infrared radiation            P2.4 Specific Heat Capacity            P2.5 Heating and insulating buildings  <b>Chapter 2 Assessment</b></p>	<p>P6.1 Density            P6.2 States of Matter            P6.3 Changes of State            P6.4 Internal energy            P6.5 Specific latent Heat            P6.6 Gas Pressure and Temperature  <b>Chapter 6 Assessment</b></p> <p>P7.1 Atoms and Radiation            P7.2 The Discovery of the Nucleus            P7.3 Changes in the nucleus            P7.4 More about Alpha, Beta and Gamma Radiation            P7.5 Activity and Half Life  <b>Chapter 7 Assessment</b></p>	<p>P12.1 The electromagnetic spectrum            P12.2 Light, infrared, microwaves and radio waves            P12.3 Communications            P12.4 Ultraviolet waves, X-rays and Gamma Rays            P12.5 X-Rays in medicine  <b>Chapter 12 Assessment</b></p> <p>P13.1 Magnetic Fields            P13.2 Magnetic fields of electric currents            P13.3 The Motor effect  <b>Chapter 13 Assessment</b></p> <p><b>Career Links:</b>            Astrophysicist, Electrical Engineer, Electrician</p>



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		<p><b>Career Links:</b> Nuclear Physicist, Radiologist, Carbon Dating</p>	
<b>Summer Term</b>	<p>P3.1 Energy Demands P3.2 Energy from wind and water P3.3 Power from the Sun and the Earth P3.4 Energy and the environment P3.5 Big Energy issues <b>Chapter 3 Assessment</b></p> <p><b>Career Links:</b> Careers linked to the energy industry (power stations, green energy technologies), building surveyors.</p>	<p>P8.1 Vectors and Scalars P8.2 Forces between Objects P8.3 Resultant Forces P8.4 Centre of Mass P8.5 The Parallelogram of Forces P8.6 Resolution of Forces <b>Chapter 8 Assessment</b></p> <p>P9.1 Speed and Distance- Time Graphs P9.2 Velocity and Acceleration P9.3 More about velocity – time graphs P9.4 Analysing Motion Graphs <b>Chapter 9 Assessment</b></p> <p><b>Career Links:</b> Mechanical Engineer, Mechanic, Pilot,</p>	<p><b>Revision</b></p>





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	<p>4.5 Stationary and progressive waves            4.6 More about stationary waves on strings            4.7 Using Oscilloscopes            5.1 Refraction of light            5.2 More about refraction            5.3 Total internal reflection</p>	<p>7.5 Motion graphs            7.6 Calculations on motion along a straight line            8.1 Force and acceleration            8.2 Using <math>F=Ma</math>            8.3 Terminal Speed            8.4 On the Road            8.5 Vehicle Safety            9.1 Momentum and impulse            9.2 Impact forces            9.3 Conservation of momentum            9.4 Elastic and inelastic collisions            9.5 Explosions            10.1 Work and energy            10.2 Kinetic Energy and Potential energy            10.3 Power            10.4 Energy and efficiency</p>	<p>27.2 Binding energy            27.3 Fission and fusion            27.4 The thermal nuclear reactor</p>	<p>2.4 Supernova, neutron stars and black holes             3.1 The Doppler effect            3.2 Hubble's law and beyond            3.3 Quasars</p>
Summer Term	<p>5.4 Double slit interference            5.5 More about interference            5.6 Diffraction            5.7 The diffraction grating</p> <p>19.1 Internal energy and temperature            19.2 Specific heat capacity            19.3 Change of state</p> <p>20.1 The experimental gas laws            20.2 The ideal gas law            20.3 The Kinetic Theory of gases</p>	<p>11.1 Density            11.2 Springs            11.3 Deformation of solids            11.4 More about stress and strain</p> <p>17.1 Uniform Circular motion            17.2 Centripetal acceleration            17.3 On the Road            17.4 At the fairground</p> <p>Additional Practical work</p>	<p>Revision</p>	<p>Revision</p>



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Curriculum Rationale:

### **Why teach AQA?**

Staff members are well versed in AQA exam materials, have been teaching AQA for a very long time, 2 members of staff recently marked for AQA

### **Why Teach 3 year GCSE**

Urmston Grammar School is a selective school and to keep the curriculum challenging and engaging GCSE is taught during Y9. This allows there to be more time to focus on the more challenging topics later in Y10 and Y11 and it also provides more time to develop Working Scientifically skills at a higher GCSE standard.

### **Why is it taught in this sequence?**

No optional content, so all topics must be covered in the specification.

The general structure follows the same order as the student textbook as this is more student friendly, students all have access to their online textbook, they write down the textbook reference code for each lesson at the start of the lesson and are able to look up work that they found difficult in their textbook, it also allows students to read ahead if necessary

### **GCSE Y9:**

Y9 Physics Begins with a practical and working scientifically skills topic. It is important students know the basic practical skills and basic Physics prefixes/SI units from the start of the course as future lessons build on this knowledge. Questions throughout the Physics course will use prefixes, SI units and ask students to analyse data

By starting with Practical Physics promotes engagement from the start.

The energy Topics will build on Work from KS3. We have also decided to start with the energy topic as it is almost the same content for both CS and TS, and students are not Separated until Y10.

### **GCSE Y10:**

The course continues following the structure of the student textbook, more complex practical and Working scientifically skills being developed.

Some Y10 topics require a higher level of maths knowledge that students may not know from Y9 for example rearranging more complex equations such as  $P=I^2R$

Assessments continue to assess Y9 + Y10 content to help memory retention

### **GCSE Y11:**

The course continues following the structure of the student textbook, more complex practical and Working scientifically skills being developed.

Some Y11 topics require a higher level of maths knowledge that students may not know from Y10 for example rearranging more complex equations such as  $V^2-u^2=2as$ , and v-t graphs and d-t graphs which are also covered in Y11 Maths lessons.

Using gradients to calculate spring constant in the force's topic is using Maths skills that they develop later in KS4.

Assessments continue to assess Y9, Y10 and Y11 content to help memory retention.



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### A-level Y12:

Fundamental concepts and Working Scientifically skills are taught in the introductory module taught by teacher 1, This ensures that all students are up to scratch with the relevant Maths skills and students that need support are highlighted from the start.

Starting with particles helps with engagement and helps distinguish between GCSE and A Level

Starting with electricity as reinforces previous knowledge and builds depth to knowledge.

The Mechanics topic is covered in the second half of the year as a similar module is taught in Maths and many students will find the topic easier if they have already developed the basic Maths skills.

Likewise, the Waves topic is taught later on as it requires higher level Maths skills

### A-level Y13:

The most difficult topics have been left for Year 13 as the Topics require the highest level of Maths, knowledge of Logarithms and they also build on prior Physics knowledge,

The Optional module turning Points in Physics has been chosen as it builds and recaps previous topics, this module is taught last as it also aids students with their revision.