

# AQA GCSE Physics: Foundation

Advance Information of Assessed Content 2022

Link to specification: <https://filestore.aqa.org.uk/resources/physics/specifications/AQA-8463-SP-2016.PDF>

Link to advance information document: <https://filestore.aqa.org.uk/content/summer-2022/AQA-8463-AI-22.PDF>

Link to revised Physics equation sheet: <https://filestore.aqa.org.uk/resources/physics/AQA-8463-ES-INS.PDF>

AQA GCSE Physics:  
Foundation Tier  
Paper 1

These specification points will be the **major focus** of this paper.

**Exam date: 9<sup>th</sup> June**

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Spec point	Concepts	Bitesize	YouTube
<b>4.1.1</b> Energy changes in a system, and the ways energy is stored before and after such changes	<ul style="list-style-type: none"> <li>identifying the energy changes in systems</li> <li>Calculate, using equations, the amount of energy associated with a moving object, a stretched spring and an object raised above ground level.</li> <li>Calculate, using an equation, the amount of energy stored in or released from a system as its temperature changes</li> <li>Calculate Power</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zskp7p3/revision/1">https://www.bbc.co.uk/bitesize/guides/zskp7p3/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/z8pk3k7/revision/1">https://www.bbc.co.uk/bitesize/guides/z8pk3k7/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/zy8g3k7/revision/1">https://www.bbc.co.uk/bitesize/guides/zy8g3k7/revision/1</a>	<a href="https://www.youtube.com/watch?v=JGwcDceYRYo">https://www.youtube.com/watch?v=JGwcDceYRYo</a>  <a href="https://www.youtube.com/watch?v=zy9eWzmGe4">https://www.youtube.com/watch?v=zy9eWzmGe4</a>  <a href="https://www.youtube.com/watch?v=Qw_9kX9PARc">https://www.youtube.com/watch?v=Qw_9kX9PARc</a>  <a href="https://www.youtube.com/watch?v=63OTidNb-TE">https://www.youtube.com/watch?v=63OTidNb-TE</a>  <a href="https://www.youtube.com/watch?v=EDTODPhaaMY">https://www.youtube.com/watch?v=EDTODPhaaMY</a>
<b>4.1.2</b> Conservation and dissipation of energy	<ul style="list-style-type: none"> <li>Describe the law of the conservation of energy</li> <li>Describe, and give examples of how energy is dissipated, or 'wasted'</li> <li>Explain ways of reducing unwanted energy transfers</li> <li>Describe thermal conductivity in relation to the rate of energy transfer by conduction, through a material</li> <li>Calculate the efficiency of a device, process or system</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/z8hsrwx/revision/1">https://www.bbc.co.uk/bitesize/guides/z8hsrwx/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/zp8jtv4/revision/1">https://www.bbc.co.uk/bitesize/guides/zp8jtv4/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/z2gitv4/revision/1">https://www.bbc.co.uk/bitesize/guides/z2gitv4/revision/1</a>	<a href="https://www.youtube.com/watch?v=H6D_ViW0Ch4">https://www.youtube.com/watch?v=H6D_ViW0Ch4</a>  <a href="https://www.youtube.com/watch?v=Ni5jaeBrIqQ">https://www.youtube.com/watch?v=Ni5jaeBrIqQ</a>  <a href="https://www.youtube.com/watch?v=43XCqAN53Sg">https://www.youtube.com/watch?v=43XCqAN53Sg</a>  <a href="https://www.youtube.com/watch?v=GTdgl-0KckA">https://www.youtube.com/watch?v=GTdgl-0KckA</a>
<b>Required Practical 2:</b> investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material	<ul style="list-style-type: none"> <li>Identify dependent, independent and control variables</li> <li>How to measure the dependent variable</li> <li>Analysing results</li> <li>Plotting graphs</li> <li>Drawing conclusions from data</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/z2gitv4/revision/3">https://www.bbc.co.uk/bitesize/guides/z2gitv4/revision/3</a>	<a href="https://www.youtube.com/watch?v=ILH45loyPUA&amp;t=2s">https://www.youtube.com/watch?v=ILH45loyPUA&amp;t=2s</a>  <a href="https://www.youtube.com/watch?v=MUy1o4ogCvw">https://www.youtube.com/watch?v=MUy1o4ogCvw</a>

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Spec point	Concepts	Bitesize	YouTube
4.2.1 Current, potential difference and resistance	<ul style="list-style-type: none"> <li>Define electric current, potential difference and resistance</li> <li>Calculate current, potential difference or resistance</li> <li>Recognise components from their graphs of current against potential difference</li> <li>Describe the application of thermistors and LDRs</li> <li>Draw an appropriate circuit diagram using correct circuit symbols</li> </ul>	<p><a href="#">Electrical circuit symbols - Electric circuits - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p> <p><a href="#">Electrical charge and current - Electric circuits - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p> <p><a href="#">Potential difference and resistance - Electric circuits - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p>	<p><a href="#">GCSE Physics - V = IR Equation &amp; Current/Potential Difference Graphs #15 – YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Resistance" – YouTube</a></p> <p><a href="#">Current &amp; Potential Difference   Electricity   Physics   FuseSchool - YouTube</a></p>
4.2.5 Static electricity	<ul style="list-style-type: none"> <li>Describe how objects can become statically charged</li> <li>describe evidence that charged objects exert forces of attraction or repulsion on one another when not in contact</li> <li>explain how the transfer of electrons between objects can explain the phenomena of static electricity.</li> <li>draw the electric field pattern for an isolated charged sphere</li> <li>explain the concept of an electric field</li> <li>explain how the concept of an electric field helps to explain the non-contact force between charged objects as well as other electrostatic phenomena such as sparking.</li> </ul>	<p><a href="#">Charging by friction - Static electricity - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p> <p><a href="#">Electric fields - Static electricity - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p>	<p><a href="#">GCSE Science Revision Physics Static Electricity (Triple) – YouTube</a></p> <p><a href="#">GCSE Science Revision Physics Electric Fields (Triple) - YouTube</a></p> <p><a href="#">GCSE Physics - Static Electricity #23 – YouTube</a></p> <p><a href="#">GCSE Physics - Electric Fields #24 - YouTube</a></p>

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Spec point	Concepts	Bitesize	YouTube
<b>Required Practical 5:</b> determine the densities of regular and irregular solid objects and liquids.	<ul style="list-style-type: none"> <li>• Method to determine density of regular shaped objects</li> <li>• Method to determine density of irregular shaped objects</li> <li>• Measurements needed to determine mass and volume of objects</li> <li>• Equipment and apparatus</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zsqngdm/revision/1">https://www.bbc.co.uk/bitesize/guides/zsqngdm/revision/1</a>	<a href="https://www.youtube.com/watch?v=ScXOp8Zph28">https://www.youtube.com/watch?v=ScXOp8Zph28</a>  <a href="https://www.youtube.com/watch?v=lvqu6JAbaKc">https://www.youtube.com/watch?v=lvqu6JAbaKc</a>
<b>4.3.1</b> Changes of state and particle model	<ul style="list-style-type: none"> <li>• Define and calculate the density of a substance or object</li> <li>• recognise/draw simple diagrams to model the difference between solids, liquids and gases</li> <li>• explain the differences in density between the different states of matter in terms of the arrangement of atoms/molecules.</li> <li>• describe how, when substances change state mass is conserved.</li> <li>• Describe changes of state as physical changes</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zqjy6yc/revision/1">https://www.bbc.co.uk/bitesize/guides/zqjy6yc/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/zwwfxfr/revision/1">https://www.bbc.co.uk/bitesize/guides/zwwfxfr/revision/1</a>	<a href="https://www.youtube.com/watch?v=hkBrw2fG75U">https://www.youtube.com/watch?v=hkBrw2fG75U</a>  <a href="https://www.youtube.com/watch?v=-EZmXVOSa20">https://www.youtube.com/watch?v=-EZmXVOSa20</a>
<b>4.3.2</b> Internal energy and energy transfers	<ul style="list-style-type: none"> <li>• Define internal energy, specific heat capacity &amp; specific latent heat</li> <li>• Calculate, using an equation, the amount of energy stored in or released from a system as its temperature changes</li> <li>• interpret heating &amp; cooling graphs</li> <li>• Use an equation that links energy transferred, mass and specific latent heat</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zcncjty/revision/1">https://www.bbc.co.uk/bitesize/guides/zcncjty/revision/1</a>	<a href="https://www.youtube.com/watch?v=4rT7-5yE4pQ">https://www.youtube.com/watch?v=4rT7-5yE4pQ</a>  <a href="https://www.youtube.com/watch?v=5WVT5NR0iLA">https://www.youtube.com/watch?v=5WVT5NR0iLA</a>  <a href="https://www.youtube.com/watch?v=x7GZ2DXef84">https://www.youtube.com/watch?v=x7GZ2DXef84</a>

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Spec point	Concepts	Bitesize	YouTube
4.4.2 Atoms and nuclear radiation	<ul style="list-style-type: none"> <li>Describe radioactive decay</li> <li>Describe the four types of nuclear radiation and their properties (ionising power and penetration through materials and the air)</li> <li>Definition and units of activity and count rate</li> <li>Write balanced nuclear equations for alpha and beta decay</li> <li>Recall the emission of a gamma ray does not cause the mass or charge of the nucleus to change</li> <li>Define half lives and determine half life from data</li> <li>Describe contamination and irradiation</li> <li>Suggest suitable precautions to take to protect against any hazard associated with contamination and irradiation</li> </ul>	<p><a href="#">Stable nuclei - Radioactive decay - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a> Pages 1 – 4</p> <p><a href="#">Irradiation - Uses and dangers of radiation - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a> Pages 1 – 2 (NOTE page 3 – 4 may be covered by allow tariff/synoptic link question)</p>	<p><a href="#">GCSE Science Revision Physics "Radioactivity" – YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Nuclear Equations" – YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Half Life" – YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Irradiation and Contamination" – YouTube</a></p>

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Spec point
4.2.3 Domestic uses and safety
4.3.3 Particle model and pressure
4.4.1 Atoms and isotopes
4.4.4 Nuclear fission and fusion

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Paper 2

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Spec point	Concepts	Bitesize	YouTube
4.5.1 Forces and their interactions	<ul style="list-style-type: none"> <li>Describe the difference between scalar and vector quantities and give examples</li> <li>give examples of contact and non-contact forces</li> <li>Describe the relationship between mass, weight and gravitational field strength</li> <li>Use an equation to calculate weight</li> <li>Calculate the resultant of two forces that act in a straight line.</li> <li>Use vector diagrams to illustrate the resolving of forces e.g. two components acting at right angles to each other</li> <li>Use free body diagrams to describe qualitatively examples where several forces lead to a resultant force on an object, including balanced forces when the resultant force is zero</li> </ul>	<p><a href="https://www.bbc.co.uk/bitesize/guides/zpqngdm/revision/1">https://www.bbc.co.uk/bitesize/guides/zpqngdm/revision/1</a></p> <p><a href="https://www.bbc.co.uk/bitesize/guides/zyxv97h/revision/1">https://www.bbc.co.uk/bitesize/guides/zyxv97h/revision/1</a></p> <p><a href="https://www.bbc.co.uk/bitesize/guides/zgncjtyr/revision/1">https://www.bbc.co.uk/bitesize/guides/zgncjtyr/revision/1</a></p>	<p><a href="https://www.youtube.com/watch?v=P1ISWWUkMdQ">https://www.youtube.com/watch?v=P1ISWWUkMdQ</a></p> <p><a href="https://www.youtube.com/watch?v=xxK8N23nx9M">https://www.youtube.com/watch?v=xxK8N23nx9M</a></p> <p><a href="https://www.youtube.com/watch?v=W2aBVbcHr_k">https://www.youtube.com/watch?v=W2aBVbcHr_k</a></p> <p><a href="https://www.youtube.com/watch?v=PL8ATKipoB4">https://www.youtube.com/watch?v=PL8ATKipoB4</a></p> <p><a href="#">GCSE Physics - Vector Diagrams and Resultant Forces #43 – YouTube</a></p> <p><a href="#">Resolving Forces using Scale Drawings – YouTube</a></p>
4.5.2 Work done and energy transfer	<ul style="list-style-type: none"> <li>Use an equation to calculate the work done to an object</li> <li>Convert between newton-metres and joules.</li> <li>Work done against the frictional forces acting on an object causes a rise in the temperature of the object.</li> </ul>	<p><a href="https://www.bbc.co.uk/bitesize/guides/zgncjtyr/revision/3">https://www.bbc.co.uk/bitesize/guides/zgncjtyr/revision/3</a></p>	<p><a href="https://www.youtube.com/watch?v=JHEmPZ-YnrU">https://www.youtube.com/watch?v=JHEmPZ-YnrU</a></p>
4.5.6.1 Describing motion along a line	<ul style="list-style-type: none"> <li>Describe the difference between distance and displacement</li> <li>Use an equation to calculate speed</li> <li>describe the difference between speed and velocity</li> <li>explain that motion in a circle involves constant speed but changing velocity.</li> <li>Interpret distance-time graphs and velocity-time graphs</li> <li>Calculate speed of an accelerating object at any particular time by drawing a tangent and measuring the gradient of the distance–time graph at that time</li> <li>Calculate the distance travelled /displacement of an object by calculating the area under a velocity–time graph.</li> <li>Use an equation to calculate acceleration</li> <li>Describe how an object reaches terminal velocity</li> </ul>	<p><a href="https://www.bbc.co.uk/bitesize/guides/zwc7pbk/revision/1">https://www.bbc.co.uk/bitesize/guides/zwc7pbk/revision/1</a></p> <p><a href="https://www.bbc.co.uk/bitesize/guides/zp2fcj6/revision/1">https://www.bbc.co.uk/bitesize/guides/zp2fcj6/revision/1</a></p>	<p><a href="https://www.youtube.com/watch?v=QaU9jIMHh7gE">https://www.youtube.com/watch?v=QaU9jIMHh7gE</a></p> <p><a href="https://www.youtube.com/watch?v=M_0FRiX8wIM">https://www.youtube.com/watch?v=M_0FRiX8wIM</a></p> <p><a href="https://www.youtube.com/watch?v=DkCw2C-DkT0">https://www.youtube.com/watch?v=DkCw2C-DkT0</a></p> <p><a href="https://www.youtube.com/watch?v=b0VKlpetP9A">https://www.youtube.com/watch?v=b0VKlpetP9A</a></p> <p><a href="https://www.youtube.com/watch?v=Kzx8GBTI5VM">https://www.youtube.com/watch?v=Kzx8GBTI5VM</a></p> <p><a href="https://www.youtube.com/watch?v=YCVSQp428GI">https://www.youtube.com/watch?v=YCVSQp428GI</a></p> <p><a href="https://www.youtube.com/watch?v=VRvjQBji0oY">https://www.youtube.com/watch?v=VRvjQBji0oY</a></p> <p><a href="https://www.youtube.com/watch?v=EkrAPvSin-M">https://www.youtube.com/watch?v=EkrAPvSin-M</a></p>



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Spec point	Concepts	Bitesize	YouTube
<b>4.6.1</b> Waves in air, fluids and solids	<ul style="list-style-type: none"> <li>Describe the differences between transverse and longitudinal waves and give examples</li> <li>Define the property terms of waves</li> <li>Compare properties of waves</li> <li>Use an equation to calculate a time period</li> <li>Use an equation that links wave speed, frequency and wavelength</li> <li>describe a method to measure the speed of sound waves in air</li> <li>describe a method to measure the speed of ripples on a water surface.</li> <li>construct ray diagrams to illustrate the reflection of a wave at a surface.</li> <li>describe the effects of reflection, transmission and absorption of waves at material interfaces.</li> </ul>	<p><a href="https://www.bbc.co.uk/bitesize/guides/zgf97p3/revision/1">https://www.bbc.co.uk/bitesize/guides/zgf97p3/revision/1</a></p> <p><a href="https://www.bbc.co.uk/bitesize/guides/z9bw6yc/revision/1">https://www.bbc.co.uk/bitesize/guides/z9bw6yc/revision/1</a></p> <p><a href="https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/1">https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/1</a></p>	<p><a href="https://www.youtube.com/watch?v=aCu4VRKMstA">https://www.youtube.com/watch?v=aCu4VRKMstA</a></p> <p><a href="https://www.youtube.com/watch?v=8K6gOST8pZk">https://www.youtube.com/watch?v=8K6gOST8pZk</a></p> <p><a href="https://www.youtube.com/watch?v=wO49W5lsP0s">https://www.youtube.com/watch?v=wO49W5lsP0s</a></p>
<b>4.6.2</b> Electromagnetic Waves	<ul style="list-style-type: none"> <li>Describe electromagnetic waves as transverse and that they form a continuous spectrum that travel the same velocity through a vacuum (space) or air.</li> <li>Describe the 7 electromagnetic waves in order of increasing wavelength or frequency</li> <li>Describe how EM waves can be absorbed, transmitted or reflected and how refraction is due to differences in velocities of the waves in different substances</li> <li>construct ray diagrams to illustrate the refraction of a wave at the boundary between two different media.</li> <li>Describe the uses and dangers of EM waves</li> <li>Recall 1000 millisieverts (mSv) = 1 sievert (Sv)</li> <li>Construct ray diagrams for converging and diverging lenses</li> <li>Calculate magnification of images</li> <li>Describe how colour filters work by absorbing certain wavelengths of light</li> <li>If all wavelengths are reflected equally the object appears white. If all wavelengths are absorbed the objects appears black.</li> </ul>	<p><a href="#">Reflection of waves - Reflection and refraction - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p> <p><a href="#">Convex and concave lenses - Lenses - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</a></p>	<p><a href="#">GCSE Science Revision Physics "Electromagnetic Waves" - YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Uses of EM waves" - YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Convex Lenses" (Triple) - YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Concave Lenses" (Triple) - YouTube</a></p> <p><a href="#">GCSE Science Revision Physics "Visible Light" (Triple) - YouTube</a></p>

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Spec point	Concepts	Bitesize	YouTube
<b>Required practical 9:</b> investigate the reflection of light by different types of surface and the refraction of light by different substances.	<ul style="list-style-type: none"> <li>Identify dependent, independent and control variables</li> <li>How to measure the dependent variable</li> <li>Analysing results</li> <li>Plotting graphs</li> <li>Drawing conclusions from data</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/3">https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/3</a>	<a href="https://www.youtube.com/watch?v=2fN_jvf4fw8">https://www.youtube.com/watch?v=2fN_jvf4fw8</a>  <a href="https://www.youtube.com/watch?v=tiqiN3y1ze4">https://www.youtube.com/watch?v=tiqiN3y1ze4</a>
<b>4.8.1</b> Solar system, stability of orbital motions, satellites	<ul style="list-style-type: none"> <li>Describe the structure of the universe and our solar system</li> <li>Describe the life cycle of a star</li> <li>explain how fusion processes lead to the formation of new elements.</li> <li>describe the similarities and distinctions between the planets, their moons, and artificial satellites.</li> <li>explain qualitatively how for circular orbits, the force of gravity can lead to changing velocity but unchanged speed, for a stable orbit, the radius must change if the speed changes.</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/zt2fcj6/revision/1">https://www.bbc.co.uk/bitesize/guides/zt2fcj6/revision/1</a>  <a href="https://www.bbc.co.uk/bitesize/guides/zpxv97h/revision/1">https://www.bbc.co.uk/bitesize/guides/zpxv97h/revision/1</a>	<a href="https://www.youtube.com/watch?v=mndRVjMovQk">https://www.youtube.com/watch?v=mndRVjMovQk</a>  <a href="https://www.youtube.com/watch?v=VOY1JlVuin4">https://www.youtube.com/watch?v=VOY1JlVuin4</a>  <a href="https://www.youtube.com/watch?v=okMA18ppu98">https://www.youtube.com/watch?v=okMA18ppu98</a>

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Spec point
<b>4.5.4</b> Moments, levers and gears
<b>4.6.2.2</b> Forces, accelerations and Newton's Laws of motion
<b>4.5.6.3</b> Forces and braking
<b>4.6.3</b> Black body radiation
<b>4.8.2</b> Red-shift