

AQA GCSE Physics: Higher

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>

Physics Paper 1 - H

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

Exam date: 9th June

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Spec point	Concepts	revision guide pages	Bitesize	YouTube
4.1.1 Energy changes in a system, and the ways energy is stored before and after such changes	<ul style="list-style-type: none"> -identifying the energy changes in systems -Calculate, using equations, the amount of energy associated with a moving object, a stretched spring and an object raised above ground level. -Calculate, using an equation, the amount of energy stored in or released from a system as its temperature changes -Calculate Power 	1-5	https://www.bbc.co.uk/bitesize/guides/zskp7p3/revision/1 https://www.bbc.co.uk/bitesize/guides/z8pk3k7/revision/1 https://www.bbc.co.uk/bitesize/guides/zy8g3k7/revision/1	https://www.youtube.com/watch?v=JGwcDceYRYo https://www.youtube.com/watch?v=-zy9eWzmGe4 https://www.youtube.com/watch?v=Qw_9kX9PARc https://www.youtube.com/watch?v=63OTldNb-TE https://www.youtube.com/watch?v=EDT0DPhaaMY
4.1.2 Conservation and dissipation of energy	<ul style="list-style-type: none"> -Describe the law of the conservation of energy -Describe, and give examples of how energy is dissipated, or 'wasted' -Explain ways of reducing unwanted energy transfers -Describe thermal conductivity in relation to the rate of energy transfer by conduction, through a material -Calculate the efficiency of a device, process or system 	1-7	https://www.bbc.co.uk/bitesize/guides/z8hsrwx/revision/1 https://www.bbc.co.uk/bitesize/guides/zp8jtv4/revision/1 https://www.bbc.co.uk/bitesize/guides/z2gjt4/revision/1	https://www.youtube.com/watch?v=H6D_ViW0Ch4 https://www.youtube.com/watch?v=NI5jaeBrlgQ https://www.youtube.com/watch?v=43XCqAN53Sg https://www.youtube.com/watch?v=GTdgl-0KckA

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Required Practical 2: 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"> -Identify dependent, independent and control variables -How to measure the dependent variable -Analysing results -Plotting graphs -Drawing conclusions from data 	7	https://www.bbc.co.uk/bitesize/guides/z2gjt4/revision/3	https://www.youtube.com/watch?v=ILH45loyPUA&t=2s https://www.youtube.com/watch?v=MUY1o4ogCvw
4.2.4 Energy Transfers	<ul style="list-style-type: none"> Use the equation that links energy transferred, charge flow and potential difference -Use the equation that links power, current and potential difference -Describe how electricity is transmitted across the National Grid -Explain the role of step-up and step-down transformers -Explain how the efficiency of energy transfer is increased in the National Grid 	13 ,17, 21, 22, 23	https://www.bbc.co.uk/bitesize/guides/z3xv97h/revision/3 https://www.bbc.co.uk/bitesize/guides/z3xv97h/revision/4	https://www.youtube.com/watch?v=WKvQLrXOqik https://www.youtube.com/watch?v=VTAFjhO1HNn https://www.youtube.com/watch?v=iNvGiTn64fQ

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Required Practical 5: determine the densities of regular and irregular solid objects and liquids.	<ul style="list-style-type: none"> -Method to determine density of regular shaped objects -Method to determine density of irregular shaped objects -Measurements needed to determine mass and volume of objects -Equipment and apparatus 	27,28	https://www.bbc.co.uk/bitesize/guides/zsqngdm/revision/1	https://www.youtube.com/watch?v=ScXOp8Zph28 https://www.youtube.com/watch?v=lvqu6JAbaKc
4.3.1 Changes of state and particle model	<ul style="list-style-type: none"> -Define and calculate the density of a substance or object -recognise/draw simple diagrams to model the difference between solids, liquids and gases -explain the differences in density between the different states of matter in terms of the arrangement of atoms/molecules. -describe how, when substances change state mass is conserved. -Describe changes of state as physical changes 	27,29, 34	https://www.bbc.co.uk/bitesize/guides/zqjy6yc/revision/1 https://www.bbc.co.uk/bitesize/guides/zwwfxfr/revision/1	https://www.youtube.com/watch?v=hkBrw2fG75U https://www.youtube.com/watch?v=-EZmXVOSa20
4.3.2 Internal energy and energy transfers	<ul style="list-style-type: none"> -Define internal energy, specific heat capacity & specific latent heat -Calculate, using an equation, the amount of energy stored in or released from a system as its temperature changes -interpret heating & cooling graphs -Use an equation that links energy transferred, mass and specific latent heat 	30-31,	https://www.bbc.co.uk/bitesize/guides/zcncity/revision/1	https://www.youtube.com/watch?v=4rT7-5yE4pQ https://www.youtube.com/watch?v=5WVT5NR0iLA https://www.youtube.com/watch?v=x7GZ2DXef8

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Spec point	Revision Guide Pages
4.2.1 Current, potential difference and resistance	13-14
4.2.2 Series & parallel circuits	18
4.2.3 Domestic uses and safety	20
4.3.3 Particle model and pressure	29-34
4.4.1 Atoms and isotopes	35,36
4.4.3 Hazards and uses of radioactive emissions and of background radiation	38-46
4.4.4 Nuclear fission and fusion	47,48

Physics Paper 2 - H

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Exam date: 23rd June

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Spec point	Concepts	Pearson revision guide pages	Bitesize	YouTube
4.5.1 Forces and their interactions	<p>Describe the difference between scalar and vector quantities and give examples</p> <ul style="list-style-type: none"> -give examples of contact and non-contact forces -Describe the relationship between mass, weight and gravitational field strength -Use an equation to calculate weight -Calculate the resultant of two forces that act in a straight line. -Use vector diagrams to illustrate the resolving of forces e.g. two components acting at right angles to each other -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 	50-55	<p>https://www.bbc.co.uk/bitesize/guides/zpqngdm/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zyxv97h/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zgncity/revision/1</p>	<p>https://www.youtube.com/watch?v=P1ISWWUkMdQ</p> <p>https://www.youtube.com/watch?v=xxK8N23nx9M</p> <p>https://www.youtube.com/watch?v=W2aBVbcHr_k</p> <p>https://www.youtube.com/watch?v=PL8ATKipoB4</p> <p>GCSE Physics - Vector Diagrams and Resultant Forces #43 – YouTube</p> <p>Resolving Forces using Scale Drawings – YouTube</p>
4.5.2 Work done and energy transfer	<ul style="list-style-type: none"> -Use an equation to calculate the work done to an object -Convert between newton-metres and joules. -Work done against the frictional forces acting on an object causes a rise in the temperature of the object. 	55-58	<p>https://www.bbc.co.uk/bitesize/guides/zgncity/revision/3</p>	<p>https://www.youtube.com/watch?v=JHEmPZ-YnrU</p>

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Spec point	Concepts	Pearson revision guide pages	Bitesize	YouTube
4.5.3 Forces and elasticity	<ul style="list-style-type: none"> -Give examples of the forces involved in stretching, bending or compressing an object -Describe the difference between elastic deformation and inelastic deformation caused by stretching forces. -Describe the relationship between the extension of an elastic object and the force applied, provided that the limit of proportionality is not exceeded. -Use an equation that links force applied, the spring constant and extension of a spring -Calculate work done/energy stored in stretching a spring (up to the limit of proportionality) 	56-58	https://www.bbc.co.uk/bitesize/guides/z9v8msg/revision/1	https://www.youtube.com/watch?v=FAHOI32oAns https://www.youtube.com/watch?v=ACDbJ8rsQDo&t=5s https://www.youtube.com/watch?v=Qw_9kX9PARc&t=44s
4.5.5 Pressure and pressure differences in fluids	<ul style="list-style-type: none"> -Use an equation to calculate the pressure at the surface of a fluid -Use an equation to calculate the pressure due to a column of liquid -calculate the differences in pressure at different depths in a liquid. -Describe the factors which influence floating and sinking. 	62	https://www.bbc.co.uk/bitesize/guides/z93dxfr/revision/1	https://www.youtube.com/watch?v=P08-IYPy1hl https://www.youtube.com/watch?v=9Gw0rIXn6ec

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Spec point	Concepts	revision guide pages	Bitesize	YouTube
4.5.6.1: Describing motion along a line	<ul style="list-style-type: none"> -Describe the difference between distance and displacement -Use an equation to calculate speed -describe the difference between speed and velocity -explain that motion in a circle involves constant speed but changing velocity. -Interpret distance-time graphs and velocity-time graphs -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 -Calculate the distance travelled /displacement of an object by calculating the area under a velocity–time graph. -Use an equation to calculate acceleration -Describe how an object reaches terminal velocity 	63-68	https://www.bbc.co.uk/bitesize/guides/zwc7pbk/revision/1 https://www.bbc.co.uk/bitesize/guides/zp2fcj6/revision/1	https://www.youtube.com/watch?v=QaU9jMHh7gE https://www.youtube.com/watch?v=M_OFRIX8wIM https://www.youtube.com/watch?v=DkCw2C-DkTO https://www.youtube.com/watch?v=b0VKIpetP9A https://www.youtube.com/watch?v=Kzx8GBTI5VM https://www.youtube.com/watch?v=YCVSQp428GI https://www.youtube.com/watch?v=VRvjQBji0oY https://www.youtube.com/watch?v=EKrAPvSin-M
4.5.7 Momentum	<ul style="list-style-type: none"> -Use an equation to calculate the momentum of an object from its mass and velocity -Describe the law of the conservation of momentum -Explain examples of momentum in an event, such as a collision -Calculate change in momentum -explain safety features with reference to the concept of rate of change of momentum. 	75-76	https://www.bbc.co.uk/bitesize/guides/zytb8mn/revision/1	GCSE Science Revision Physics "Momentum" – YouTube GCSE Physics - Momentum Part 1 of 2 - Conservation of Momentum Principle #59 – YouTube GCSE Physics - Momentum Part 2 of 2 - Changes in Momentum #60 – YouTube

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4.6.1 Waves in air, fluids and solids	<ul style="list-style-type: none"> -Describe the differences between transverse and longitudinal waves and give examples -Define the property terms of waves -Compare properties of waves -Use an equation to calculate a time period -Use an equation that links wave speed, frequency and wavelength -describe a method to measure the speed of sound waves in air -describe a method to measure the speed of ripples on a water surface. -construct ray diagrams to illustrate the reflection of a wave at a surface. -describe the effects of reflection, transmission and absorption of waves at material interfaces. 	78-85	<p>https://www.bbc.co.uk/bitesize/guides/zgf97p3/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/z9bw6yc/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/1</p>	<p>https://www.youtube.com/watch?v=aCu4VRKMstA</p> <p>https://www.youtube.com/watch?v=8K6gOST8pZk</p> <p>https://www.youtube.com/watch?v=wO49W5lsP0s</p>
Required practical 9: investigate the reflection of light by different types of surface and the refraction of light by different substances.	<ul style="list-style-type: none"> -Identify dependent, independent and control variables -How to measure the dependent variable -Analysing results -Plotting graphs -Drawing conclusions from data 	83	<p>https://www.bbc.co.uk/bitesize/guides/zw42ng8/revision/3</p>	<p>https://www.youtube.com/watch?v=2fN_jvf4fw8</p> <p>https://www.youtube.com/watch?v=tiqiN3y1ze4</p>

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4.8.1 Solar system, stability of orbital motions, satellites	<ul style="list-style-type: none"> -Describe the structure of the universe and our solar system -Describe the life cycle of a star -explain how fusion processes lead to the formation of new elements. -describe the similarities and distinctions between the planets, their moons, and artificial satellites. -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. 	104-106	<p>https://www.bbc.co.uk/bitesize/guides/zt2fcj6/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zpxv97h/revision/1</p>	<p>https://www.youtube.com/watch?v=mndRVjMvQk</p> <p>https://www.youtube.com/watch?v=V0Y1JlVuin4</p> <p>https://www.youtube.com/watch?v=okMA18ppu98</p>
4.8.2 Red shift	<ul style="list-style-type: none"> -Explain how red-shift provides evidence for the expansion of the universe and the Big Band model -Describe the Big Bang theory -Explain that the change of each galaxy's speed with distance is evidence of an expanding universe - Explain how scientists are able to use observations to arrive at theories such as the Big Bang theory 	107	<p>https://www.bbc.co.uk/bitesize/guides/zstb8mn/revision/1</p>	<p>https://www.youtube.com/watch?v=C90DOE87TYc</p> <p>https://www.youtube.com/watch?v=bWEtm-7cYzM</p>

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Spec point	Pearson Revision Guide Pages
4.5.4 Moments, levers and gears	59-60
4.6.2 Electromagnetic waves	86-87
4.6.3 Black body radiation	93
4.7.1 Permanent and induced magnetism, magnetic forces and fields	95-99