

Exam Board:	AQA
Subject:	Separate Science - Physics
Paper:	Physics Paper 2 (March)
Marks available:	100
Length of paper:	1 hour 45 minutes
Topics:	Forces, Waves, Space, Magnetism and Electromagnetism

Exam Information, guidance and hints

Command words:

- Complete - Fill in gaps/add labels, finish diagrams or graphs
- Give - Recall a simple fact
- Draw - Draw a symbol, diagram or graph
- Describe - Give details about an event, idea or a process
- Explain - Give reasons for an event, idea or process (use because/so)
- Compare - Identify how things are similar/different
- Suggest - Use your own knowledge in an unfamiliar context
- Calculate - Use numbers in a formula
- Complete - Fill the gaps or add to a diagram
- Determine - Work out mathematically
- Evaluate - Compare the pros and cons then give a judgement

Online Resources

- [Cognito past papers](#)

Hints/tips: You need to be able to use the following calculations

- Speed = distance / time
- Acceleration = change in velocity / time
- Weight = mass x gravitational field strength
- Pressure = weight / area
- Period = 1 / frequency
- Force = spring constant x extension
- Force = mass x acceleration
- Work done = force x distance moved
- Moment = force x perpendicular distance
- Wave speed = frequency x wavelength
- $V^2 - U^2 = 2 \times a \times s$
- How to calculate a mean
- How to calculate % change
- Higher only
 - Pressure = height x density x gravitational field strength
 - Calculate uncertainty

Foundation Example Papers and Markschemes

Higher Example Papers and Markschemes

2018 F Paper	Annotated P2	2018 MS	2018 H paper	Annotated P2	2018 MS
2019 F Paper	Annotated P2	2019 MS	2019 H Paper	Annotated P2	2019 MS
2020 F Paper	Annotated P2	2020 MS	2020 H Paper	Annotated P2	2020 MS

PLC Combined Science: Physics Paper 2 - Mock 2

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
				Red	Amber	Green
Forces	Describe how to investigate force and acceleration using a trolley and light gates	R149	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_10.07			
Forces	Calculate force using $F = m \times a$	R138	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.07			
Forces	Identify scalar and vector quantities	R197	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_2.02			
Forces	Calculate distance using $\text{speed} = \text{distance} / \text{time}$	R374	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.01			
Forces	Describe changes in motion/speed using a distance time graph	R908	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.04			
Forces	Identify forces in different scenarios (e.g weight, tension, friction, air resistance)	R853	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_2.01			
Forces	Estimate the typical running and walking speeds for humans	R374	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.01			
Forces	Calculate weight using $\text{weight} = \text{mass} \times \text{gravitational field strength}$	R590	https://www.youtube.com/watch?v=W2aBVbcHr_k&pp=ygUOI2V4cGxhaW5jZW50cmU%3D			
Forces	Calculate pressure using $\text{pressure} = \text{force} / \text{area}$	R564	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.12			
Forces	State how to draw force lines showing pressure	R129	https://www.youtube.com/watch?v=P08-IYPy1hl&t=19s			
Forces	Calculate acceleration using $\text{acceleration} = \text{change in velocity} / \text{time}$	R760	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.02			

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
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Forces	Calculate work done using work done = force x distance	R307	https://www.youtube.com/watch?v=PY80j_iNT9Y			
Forces	Calculate final velocity using $v^2 - u^2 = 2 a s$	R799	https://www.youtube.com/watch?v=qpgWzTwnwUk			
Forces	Apply Newton's first law to explain why objects are stationary	R744 R893	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.07			
Forces	Calculate force using force = spring constant x extension	R598 R353	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_2.08			
Forces	Explain changes in velocity based on changes in forces (using Newton's first law)	R760	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.02 https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.06			
Forces	Calculate moments using Moment = force x perpendicular distance	R563	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.1			
Forces	Explain why the principle of moments is useful when using levers and gears	R324 R473	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.11			
Forces	Explain the link between depth and pressure in fluids	R129	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.12 https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.13			
Forces	Calculate the pressure in a fluid using the equation Pressure = depth x density x gravitational field strength	R129	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_2.12			

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
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Forces	HIGHER: Explain how to calculate acceleration from an average velocity.	R149	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.02 https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_10.07			
Forces	Explain the relationship between incline and acceleration when investigating $F=ma$ with a trolley/ramp setup	R149	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.07 https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_10.07			
Forces	Higher: Calculate distance from a velocity time graph	R176	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.05			
Forces	Calculate acceleration and deceleration from a velocity time graph (HIGHER: including from curved lines)	R663	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.05			
Forces	Explain how different factors affect thinking distance and braking distance	R823 R134 R107	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.09			
Forces	Explain the relationship between acceleration and braking force	R107	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_3.09			
Waves	Describe the properties, uses and dangers of electromagnetic waves	R288 R919 R993	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.05			
Waves	Compare different types of electromagnetic wave	R288	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.05			
Waves	Compare the rate of infrared emission of objects with different temperatures	R699	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_10.18			

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Waves	Describe and label the structure of transverse and longitudinal waves	R186	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.01			
Waves	Give examples of transverse and longitudinal waves	R186	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.01			
Waves	Calculate period using period = 1/frequency	R103 R569	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.01			
Waves	Calculate wavelength using wave speed = frequency x wavelength	R103 R569	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.01			
Waves	Describe how to use bricks, a wall, a tape measure and a stopwatch to calculate the speed of sound in air	R803	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.16			
Waves	Describe what happens to the wavelength of waves when they move from air to water (more dense to less dense)	R992	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.04			
Waves	Identify the equipment used to detect infrared	R699	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_10.18			
Waves	Understand that visible light is the range of wavelengths of the electromagnetic spectrum that humans can see	R488	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.13			
Waves	Explain how we see colour	R488	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.13			
Waves	Explain how colour filters work	R488	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.13			
Waves	Compare diffuse and specular reflection	R241	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.03			

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Waves	Describe an experiment to investigate the law of reflection	R241	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.03			
Waves	Describe an experiment to investigate refraction in glass blocks	R233	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.04			
Waves	Draw, label and identify ray diagrams for reflection and refraction	R198	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.03 https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.04			
Waves	Explain how seismic waves can be used to demonstrate the structure of the Earth's core	R382	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.19			
Waves	Explain how P and S waves are used to detect earthquakes	R382	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_4.19			
Waves	HIGHER: Explain how radio waves are produced	R556	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-c_4.06			
Magnetism and Electromagnetism	Identify magnetic materials	R882	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.01			
Magnetism and Electromagnetism	Describe how to draw magnetic field lines using plotting compasses for both bar magnets and wires	R847	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.01			
Magnetism and Electromagnetism	Draw and describe magnetic fields including how they interact	R847	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.01			
Magnetism and Electromagnetism	Describe how changes in current can change the magnetic field around an electromagnet	R342 R344	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.03			

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Magnetism and Electromagnetism	HIGHER: Explain how the motor effect works	R766 R931	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.04			
Magnetism and Electromagnetism	HIGHER: Explain how the generator effect works	R717	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.06			
Magnetism and Electromagnetism	HIGHER: Describe how changes in the magnetic field can change the current induced in the generator effect	R717	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.06			
Magnetism and Electromagnetism	HIGHER: Explain how the motor effect is used in loudspeakers	R247	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.08			
Magnetism and Electromagnetism	HIGHER: Explain how the generator effect is used in microphones	R247	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_6.08			
Space	Name our galaxy	R935	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.02			
Space	Describe how stars are formed, including the forces involved	R540	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.01			
Space	Describe the composition of our solar system	R935	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.02			
Space	Explain how black holes are formed	R540	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.01			
Space	Interpret light spectra and what they tell us about red shift	R718	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.04			
Space	Describe what red shift is and explain its effect on the wavelength of light	R718	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.04			

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Space	Explain how stars produce and distribute all elements in the universe	R540	https://cognitoedu.org/coursesubtopic/p2-gcse-aq-a-h-t_9.01			
Scientific Skills	Convert values in standard form between m, km, Mm and Gm	X	https://www.youtube.com/watch?v=1JQAJBtKkOM			
Scientific Skills	Identify proportional and directly proportional relationships from graphs (knowing how they are different)	X	https://www.youtube.com/watch?v=R_Re1g80UmE			
Scientific Skills	Identify variables in experiments	X	https://www.youtube.com/watch?v=nKbUbfadxRU			
Scientific Skills	Calculate a mean	X	https://www.youtube.com/watch?v=nYScfgOdz_A			
Scientific Skills	Describe relationships shown in graphs	X	https://www.youtube.com/watch?v=OzDUYj6nNCA			
Scientific Skills	Calculate % change	X	https://www.youtube.com/watch?v=jAcDJDjQk2g			
Scientific Skills	Write numbers to a specific number of decimal places	X	https://www.youtube.com/watch?v=P7ozJW8LSxw			
Scientific Skills	Write numbers to a specific number of significant figures	X	https://www.youtube.com/watch?v=-X0amVzMKFo			
Scientific Skills	Calculate uncertainty	X	https://www.youtube.com/watch?v=sXeUIGW3nRY			