

**Unit Code:** J259/01

**Qual Name:** GCSE Physics B (Twenty First Century Science)

**Qual Title:** Breadth in physics (Foundation)

**Tier:** Foundation

Question Set	Q. No	Total Marks	AO	Spec Ref.	Topic	Question Subject, If required	Additional Notes/Comments	Maths Skills	Practical Assessment Skills
1	1a	1	1	1.3.4	Waves	types of waves			
1	1b	2	2	1.3.6	Waves	calculation of wave speed		Y	
2	1ai	2	1	2.2.6	Domestic electricity	Wiring a plug			
2	1aii	1	1	2.2.4	Domestic electricity	Domestic voltage			
2	1b	2	1	2.2.4	Domestic electricity	Domestic supply			
3	1a	1	1	4.2.2	Motion	Estimate typical speeds			
3	1b	1	2	4.2.4	Motion	Estimate typical speeds		Y	
3	1ci	2	1 and 2	4.2.8	Motion	Interpreting speed-time graph		Y	
3	1cii	3	1 and 2	4.2.8	Motion	Calculating acceleration		Y	
4	1	3	1 and 2	4.1.7	Mass and weight	Calculation of weight given a mass	Need to recall an equation	Y	
5	1a	3	1 and 2	4.3.9	Forces & Motion	Moments	Need to recall equation	Y	
5	1b	3	1 and 2	4.3.9	Forces & Motion	Moments	Need to recall equation	Y	
6	1a	2	1 and 2	1.4.1	Light	Ray diagram			
6	1bi	2	1	6.2.2	Particle model explaining the effects of heating	Changes of state			
6	1bii	2	1	1.4.5	Light	Scattering of light			
7	1ai	1	1	6.3.3b	How particle model relates to material under stress	Hooke's Law		Y	Y
7	1aii	3	1 and 2	6.3.5	How particle model relates to material under stress	Calculation of spring constant	Need to recall equation	Y	Y
7	1b	3	1 and 2	6.3.7	How particle model relates to material under stress	Calculation of energy stored		Y	Y
7	1c	1	3	6.3.4	How particle model relates to material under stress	Hooke's Law			Y
7	1d	3	1	2.1.4	How particle model relates to material under stress	Energy transfers			Y
8	1ai	1	1	5.1.6	Radioactivity	Structure of the atom			
8	1aii	1	1	5.1.6	Radioactivity	Structure of the atom			
8	1bi	2	3	5.2.1	Radioactivity	Types of radiation			

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8	1bii	2	3	5.2.1	Radioactivity	Types of radiation			Y
8	1c	2	3	5.2.5	Radioactivity	Hazards of radiation			
9	1ai	1	2	3.2.6	Circuit electricity	Drawing circuits			Y
9	1aii	2	2	3.2.6	Circuit electricity	Variable resistor			Y
9	1bi	4	1 and 2	3.2.4	Circuit electricity	Ohm's Law	Recall and use equation	Y	
9	1bii	1	3	3.2.5	Circuit electricity	Non-Ohmic behaviour			
9	1biii	2	3	3.2.5	Circuit electricity	Non-Ohmic behaviour			
10	1ai	1	1	3.5.2	Magnetism	Magnetic fields			
10	1aii	1	1	3.5.2	Magnetism	Magnetic fields			
10	1b	1	1	3.5.4	Magnetism	Permanent and induced magnetism			
10	1c	2	1 and 2	3.5.3	Magnetism	Magnetism of the Earth			
11	1a	3	3	1.1.5	Electromagnetic waves	Behaviour of electromagnetic radiation			
11	1b	2	1	1.1.5	Electromagnetic waves	Behaviour of electromagnetic radiation			
11	1c	2	3	1.1.5	Electromagnetic waves	Behaviour of electromagnetic radiation			Y
12	1a	2	1	6.5.1	The Solar system	Features of the Solar system	Overlap question		
12	1b	2	1	6.5.1	The Solar system	Formation of the Solar system	Overlap question		
12	1c	1	1	5.3.4	Nuclear reactions	Nuclear fusion	Overlap question		
13	1a	1	1	2.1.1	How much energy do we use?	Energy transfers	Overlap question		
13	1bi	3	1 and 2	3.4.3	Electricity	Calculation of electrical energy	Overlap question	Y	
13	1bii	4	1 and 2	3.2.2	Electricity	Charge and current	Overlap question	Y	
14	1a	2	2	6.1.5	Specific heat capacity	Calculation	Overlap question	Y	
14	1bi	3	1 and 2	2.1.3	Energy and power	Calculation	Overlap question	Y	
14	1bii	1	1	2.1.5	Energy	Energy dissipation	Overlap question		
15	1a	1	1	3.2.1	Circuit electricity	Basic circuit diagram			
15	1b	2	2	3.2.4	Circuit electricity	Ohm's Law calculation		Y	
15	1ci	2	2 and 3	3.2.1	Circuit electricity	Basic circuit diagram			
15	1cii	1	3	3.2.1	Circuit electricity	Basic circuit diagram			Y
16	1ai	1	1	1.1.1	Risks and benefits of using radiations	Electromagnetic waves			
16	1aii	1	1	1.1.2	Risks and benefits of using radiations	Electromagnetic waves			
16	1bi	1	2	4.2.1	How we describe motion	Calculating speed		Y	
16	1bii	1	1	1.1.3	Risks and benefits of using radiations	Electromagnetic waves			
16	1biii	1	1	1.1.3	Risks and benefits of using radiations	Electromagnetic waves			

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17	1a	1	1	5.1.3	What is radioactivity	Size of atom			
17	1b	2	1	5.1.2	What is radioactivity	Models of the atom			
17	1c	2	1	5.1.4	What is radioactivity	Structure of the atom			
17	1di	1	1	5.1.6	What is radioactivity	Mass of nuclei			
17	1dii	1	1	5.1.6	What is radioactivity	Charges of nuclei			
18	1a	3	1	3.5.6	Magnetic fields	Drawing magnetic field lines			
18	1bi	1	1	3.5.7	Magnetic fields	Magnetic field around a current carrying wire			
18	1bii	1	2	3.5.7	Magnetic fields	Magnetic field around a current carrying wire			Y
18	1c	1	1	3.5.3	Magnetic fields	Earths magnetic field			
19	1a	3	1 and 2	6.4.2	Pressure in fluids	Calculation of pressure	Given the equation in the question	Y	
19	1bi	2	1	6.4.4	Pressure in fluids	Particle model			
19	1bii	2	2	6.4.5	Pressure in fluids	Calculation using Boyle's Law	Given the equation in the question	Y	
20	1a	2	2	1.3.1	Wave motion	Finding wavelength		Y	
20	1bi	2	1	1.3.4	Waves	Transverse and longitudinal waves			
20	1bii	2	1	1.3.3	Waves	Transverse and longitudinal waves			
21	1a	2	1 and 2	6.3.1	Materials under stress	Stretching forces			
21	1bi	1	1	6.3.2	Materials under stress	Elastic and plastic deformation			
21	1bii	1	3	6.3.2	Materials under stress	Elastic and plastic deformation			
21	1ci	1	1	6.3.4	Materials under stress	Hooke's Law		Y	
21	1cii	2	3	6.3.4	Materials under stress	Hooke's Law		Y	
22	1ai	2	1	2.2.3	Electricity generation	Difference and similarities of fossil fuels and wind power			
22	1aii	2	1	5.3.4, 6.5.6	Fusion reaction in the Sun	Energy stored in the Sun and how it's converted to radiation			
22	1bi	3	1 and 2	2.1.8	Efficiency	Calculation of efficiency	Need to recall equation	Y	
22	1bii	2	3	2.1.8	Efficiency	Judgement using data			
23	1a	3	2	6.1.5	Specific heat capacity	Calculation of energy	Given the equation to use	Y	
23	1b	3	1 and 2	3.4.4	Electrical power	Calculation of power	Need to recall equation	Y	
23	1ci	2	2	6.1.5	Specific heat capacity	Experiment to measure shc			Y
23	1cii	1	3	6.1.5	Specific heat capacity	Experiment to measure shc			Y
24	1ai	3	1 and 2	4.4.3	Kinetic energy	Calculating kinetic energy. Recall equation		Y	
24	1aii	3	1 and 2	4.4.4	Potential energy	Calculation of height. Recall and rearrange equation		Y	
24	1bi	1	1	4.4.7	Energy stores	Energy stores in a context			

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24	1bii	1	1	4.4.7	Energy stores	Energy stores in a context			
24	1biii	2	3	4.4.7	Energy stores	Interpreting data on graph		Y	
25	1a	3	1 and 2	6.1.6	Specific heat capacity	Calculation of energy	Overlap question	Y	
25	1b	2	2	2.1.6	Thermal energy transfer	Ice cubes on different materials	Overlap question		
25	1ci	2	3	2.1.6	Thermal energy transfer	Improvements to an experiment	Overlap question		Y
25	1cii	1	3	6.1.3	Thermal energy transfer	Developing an experiment	Overlap question		Y
26	1ai	1	2	4.1.3	Forces	Drawing force arrows on diagram	Overlap question		
26	1aii	1	2	4.1.2	Forces	Drawing force arrows on diagram	Overlap question		
26	1bi	2	1	4.1.1	Forces	Newton's 3rd Law	Overlap question		
26	1bii	1	2	4.1.1	Forces	Newton's 3rd Law	Overlap question		
27	1a	2	1	5.2.2	Radioactivity	Contamination or irradiation	Overlap question		
27	1b	1	1	5.2.4	Radioactivity	Hazards of using radioactive materials	Overlap question		
27	1c	2	3	5.2.5	Radioactivity	Different types of radiation	Overlap question		
28	1ai	1	1	6.1.1	Density	How to measure mass			Y
28	1aii	1	1	6.1.1	Density	How to measure volume of liquid			Y
28	1b	2	1	6.1.1	Density	How to measure volume of solid			Y
28	1c	2	2	6.1.2	Density	Calculation of density.	Equation given in question	Y	
28	1d	2	2	6.1.1	Density	Measuring volume of irregular solid			Y
29	1ai	1	1	5.3.1	Nuclear reactions	Nuclear fission			
29	1aii	1	1	5.3.1	Nuclear reactions	Nuclear fission			
29	1b	2	1	5.3.2	Nuclear reactions	Nuclear fission			
29	1ci	2	1	5.3.4	Nuclear reactions	Nuclear fusion			
29	1cii	1	1	5.3.4	Nuclear reactions	Nuclear fusion			
30	1a	2	1	1.3.3	Waves	Transverse and longitudinal waves			
30	1bi	2	1	1.3.7	Waves	Finding wavelength		Y	
30	1bii	1	3	1.3.7	Waves	Timing			Y
30	1c	2	2	1.3.6	Waves	Calculating wave speed	Equation is given in question	Y	
30	1d	2	2	1.3.2	Waves	Nature of waves			Y
31	1ai	1	1	2.1.1	Energy transfers	Stored energy used by wind turbines			
31	1aii	1	1	2.1.1	Energy transfers	Stored energy in a battery			
31	1b	2	2	2.1.5	Energy transfers	Energy transfers with battery powered vacuum cleaner			
31	1c	3	1 and 2	3.4.4	Energy transfers	Calculation of electrical power	Equation given in question	Y	
31	1di	3	1 and 2	3.4.2	Energy transfers	Calculation of energy	Need to recall equation	Y	

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31	1dii	2	2	2.1.2	Energy transfers	Power and energy transfer comparison			
32	1a	1	1	4.1.5	Mass and weight	definition of weight			
32	1bi	1	1	4.1.6	Mass and weight	measuring instrument for weight			Y
32	1bii	1	1	4.1.6	Mass and weight	finding weight of a bag			Y
32	1c	3	1 and 2	4.1.7	Mass and weight	Calculation of mass	Need to recall and rearrange equation	Y	
33	1a	1	2	2.1.9	Energy transfers	Sankey diagram		Y	
33	1b	3	1 and 2	2.1.8	Energy transfers	Calculation of efficiency	Equation given in question.	Y	
34	1a	2	2	4.3.1	Forces	Forces on a paper clip			
34	1b	2	1	4.1.3	Forces	Newton's 3rd Law			
34	1ci	1	3	4.3.6	Forces	Newton's first law			
34	1cii	1	3	4.3.6	Forces	Newton's first law			
35	1a	3	1 and 2	6.3.7	Energy stored in a spring	Calculation of energy	Equation given in question	Y	
35	1bi	2	2	2.1.4	Energy transfers	Stored elastic energy of spring changing			
35	1bii	1	2	2.1.4	Energy transfers	Total energy of a closed system			
36	1a	2	1	4.2.1	Speed of sound	Calculation of speed	Equation given in question	Y	
36	1bi	1	3	1aS 2.9	Accuracy and precision	Accuracy			Y
36	1bii	1	3	1aS 2.9	Accuracy and precision	Precision			Y
36	1ci	1	3	1.3.7(a)	Speed of sound	Improvement to a method			Y
36	1cii	1	3	1.3.7(a)	Speed of sound	Improvement to a method			Y
37	1a	3	1	6.3.3 (b)	Extension of a spring	Investigating extension of a spring			Y
37	1b	3	1 and 2	6.3.5	Extension of a spring	Calculation of spring constant	Need to recall equation	Y	
37	1ci	1	1	6.3.3 (b)	Extension of a spring	Calculation of median		Y	
37	1cii	1	1	6.3.3 (b)	Extension of a spring	Calculation of mean		Y	
38	1a	2	3	2.1.7, 1.1.5	Energy transfers	Thermal insulation experiment	Overlap question		Y
38	1bi	2	1	2.1.7	Energy transfers	Thermal insulation experiment	Overlap question		Y
38	1bii	1	2	2.1.7	Energy transfers	Thermal insulation experiment	Overlap question		Y
39	1ai	1	3	2.2.7	Energy resources	Trend shown in a graph showing percentage of UK energy supplied from low carbon sources over time	Overlap question		
39	1aii	1	3	2.2.7	Energy resources	Reason for trend	Overlap question		

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39	1bi	2	3	2.2.7	Energy resources	Evaluating evidence	Overlap question		
39	1bii	1	3	2.2.7	Energy resources	Interpreting graph	Overlap question		
39	1biii	1	2	2.2.7	Energy resources	Extracting data from graph	Overlap question	Y	
40	1a	2	1	1.1.7	Electromagnetic radiation	Ultraviolet radiation	Overlap question		
40	1bi	2	1	1.1.8	Electromagnetic radiation	Ultraviolet radiation	Overlap question		
40	1bii	1	3	1.1.8	Electromagnetic radiation	Ultraviolet radiation	Overlap question		
40	1c	2	1	5.2.1	Radioactivity	Alpha radiation	Overlap question		