

International GCSE

Science (Single Award) (9–1)

Getting Started Guide

Pearson Edexcel International GCSE in Science (Single Award) (4SS0)

First teaching September 2017

First examination June 2019

Issue 2





Contents

Introduction	4
Key features of the qualification	5
Qualification overview	8
Assessment guidance	21
Planning.....	25
Delivery of the qualification – transferable skills	33

Science (Single Award) (2017) (4SS0)

Getting Started Guide



Through initiatives such as onscreen marking and administration, Pearson is leading the way in using technology to modernise educational assessment, and to support teachers and learners.

This guide is Issue 2. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson Edexcel website:

<https://qualifications.pearson.com/>

References to third-party material made in this guide are made in good faith. We do not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)

All the material in this publication is copyright.

© Pearson Education Limited 2024

Pearson Edexcel International GCSE Science (Single Award) (2017) – Getting Started Guide – Issue 2 – November 2024

© Pearson Education Limited 2024



Introduction

This Getting Started Guide provides an overview of our International GCSE Science (Single Award) (2017) qualification, to help you get to grips with the changes to content and assessment, and to help you understand what these mean for you and your learners.

Our package of support to help you plan and implement the specification includes:

Planning

We will provide a course planner and an editable scheme of work that you can adapt to suit your department. We also provide training for international and UK-based schools.

Teaching and learning

To support you in delivering this new specification, we will provide suggested resource lists and suggested activities.

Understanding the standard

Sample Assessment Materials and Extra Assessment Materials will be provided.

Tracking learner progress

ResultsPlus provides the most detailed analysis available of your students' examination performance. It can help you identify topics and skills where students could benefit from further learning. We will also offer **examWizard**, which is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiners' reports for a range of GCSE and GCE subjects.

Support

Our subject advisor ensures that you receive help and guidance from us. You can sign up to receive updates at <https://qualifications.pearson.com/en/forms/subject-advisor-updates-for-teachers-andtutors.html> or contact us using the support portal <https://support.pearson.com/uk/s/qualificationcontactus>.



Key features of the qualification

Why choose Pearson Edexcel International GCSE in Science (Single Award) (2017)?

We have listened to feedback from all parts of the international school, UK independent school and language teaching community including a large number of teachers. We have made changes that will engage students and give them skills that will support progression to further study in science and a range of other subjects. Our content and assessment approach has been designed to meet students' needs and be consistent with our approach across the sciences.

Key qualification features

At Pearson, we offer separate science linear (2017) and modular qualifications in Biology, Chemistry and Physics and Double Award Science, as well as a linear Single Award Science qualification – these have been designed to meet different learners' needs. The content and assessment approach for this qualification has been designed to maintain the rigorous standards of all Pearson Edexcel qualifications and meet learner needs in the following ways:

- Content that is interesting and engaging for learners but is also designed to ensure good preparation, both for those continuing to further study and for those wishing to work in a biology-related field.
- There are opportunities to 'localise' the content to make it more relevant for learners in their own country.

Assessment structure

The Pearson Edexcel International GCSE in Science (Single Award) (2017) is a linear qualification. Two untiered written examinations must be taken in the same series at the end of the course of study. The assessment model has three papers – 1 Biology, 1 Chemistry and 1 Physics. Each paper is 1 hour 10 minutes long and assesses content from across the specification. The content assessed is less than that assessed in Science (Double Award). All papers will have a range of question styles and calculators can be used in all papers. Practical skills will be assessed through the written papers; there is no coursework or practical exam.



Clear and straightforward question papers

- Our question papers are clear and accessible for all learners of all ability ranges and learning styles. Our mark schemes are straightforward, so that the assessment requirements are clear.

Broad and deep development of learners' skills

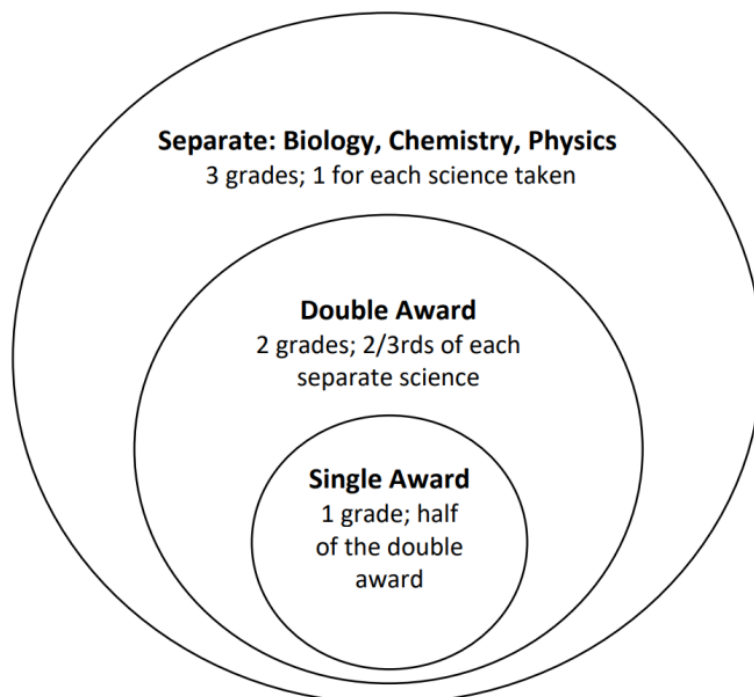
- The design of the international GCSEs aims to extend learners' knowledge and understanding by broadening and deepening skills, for example learners develop the ability to:
 - focus on practical skills through a number of practicals listed in the specification content. These can be supplemented with other suggested practicals. The skills developed will be assessed through questions in written examinations.
 - improve learners' analytical and logic skills by applying understanding of scientific concepts and principles to a range of situations. This will include some examination questions that are more problem solving in style.
 - address the need for mathematical skills to complement learners' science skills by covering a range of mathematical areas.

Progression

The Pearson Edexcel International GCSE in Science (Single Award) qualification is not expected to lead directly to further study in Level 3 science qualifications such as the International Advanced Levels. It provides a solid understanding and appreciation of science that supports further Level 1/2 study or employment opportunities.

Courses to suit your learners' needs and interests

Teachers of science have a choice of International GCSE courses to deliver, each giving different levels of depth to meet learners' needs. As well as the Pearson Edexcel International GCSE in Science (Single Award) (2017), learners can also be taught our International GCSE in Science (Double Award) (2017), International GCSE in Physics (2017), International GCSE in Chemistry (2017), International GCSE in Biology (2017), and their modular equivalents. This course offers a reduced amount of content, as demonstrated in the diagram below.



All these qualifications are assessed to the same standard. Progression routes for this course may vary slightly from those for the Pearson Edexcel International GCSE in Biology, Chemistry, Physics and Science (Double Award).

More information about all our qualifications can be found on our Edexcel International GCSE pages at [qualifications.pearson.com](https://www.pearson.com/qualifications)



Qualification overview

Paper 1	Paper code 4SS0/1B
<ul style="list-style-type: none"> Externally assessed Availability: June First assessment: June 2019 	33.3% of the total International GCSE
Content summary Topics covering core biology content areas: <ol style="list-style-type: none"> The nature and variety of living organisms Structures and functions in living organisms Reproduction and inheritance Ecology and the environment Use of biological resources 	
Assessment <ul style="list-style-type: none"> The paper is assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson. The total number of marks is 60. A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions. A calculator may be used in the examinations. 	

Paper 2	Paper code 4SS0/1C
<ul style="list-style-type: none"> Externally assessed Availability: June First assessment: June 2019 	33.3% of the total International GCSE
Content summary Topics covering core chemistry content areas: <ol style="list-style-type: none"> Principles of chemistry Inorganic chemistry Physical chemistry Organic chemistry 	
Assessment <ul style="list-style-type: none"> The paper is assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson. The total number of marks is 60. A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions. A calculator may be used in the examinations. 	



Paper 3	Paper code 4SS0/1P
<ul style="list-style-type: none">Externally assessedAvailability: JuneFirst assessment: June 2019	33.3% of the total International GCSE
Content summary Topics covering core physics content areas: <ol style="list-style-type: none">Forces and motionElectricityWavesEnergy resources and energy transfersSolids, liquids and gasesMagnetism and electromagnetismRadioactivity and particlesAstrophysics	
Assessment <ul style="list-style-type: none">The paper is assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson.The total number of marks is 60.A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions.A calculator may be used in the examinations.	

Content Overview

The specification content is divided into the topics, to provide centres with a clear view of what is required. Each topic is then divided into a number of key ideas (sub-topics) that give a focus to the content. Each key idea is broken down into detailed content that specifies what must be studied. The word 'including' in the content specifies the detail of what must be covered. Examination questions will be based on this content.



Qualification aims

The aims and objectives of this qualification are to enable learners to:

- learn about unifying patterns and themes in science and use them in new and changing situations
- acquire knowledge and understanding of scientific facts, terminology, concepts, principles and practical techniques
- apply the principles and concepts of science, including those related to the applications of science, to different contexts
- evaluate scientific information, making judgements on the basis of this information
- appreciate the practical nature of science, developing experimental and investigative skills based on correct and safe laboratory techniques
- analyse, interpret and evaluate data and experimental methods, drawing conclusions that are consistent with evidence from experimental activities
- recognise the importance of accurate experimental work and reporting scientific methods in science
- select, organise and present relevant information clearly and logically using appropriate vocabulary, definitions and conventions
- develop a logical approach to problem solving in a wider context
- select and apply appropriate areas of mathematics relevant to science as set out under each topic

Experimental skills

The best way to develop experimental skills is to embed practical investigations in teaching or theory. The development of knowledge and experimental skills can then happen together, leading to secure acquisition of both knowledge and skills.

The skills developed through these and other practicals will be assessed through written examinations. In the assessment of experimental skills, learners may be tested on their ability to:

- solve problems set in a practical context
- apply scientific knowledge and understanding in questions with a practical context
- devise and plan investigations, using scientific knowledge and understanding when selecting appropriate techniques
- demonstrate or describe appropriate experimental and investigative methods, including safe and skillful practical techniques
- make observations and measurements with appropriate precision, record these methodically and present them in appropriate ways
- identify independent, dependent and control variables



- use scientific knowledge and understanding to analyse and interpret data to draw conclusions from experimental activities that are consistent with the evidence
- communicate the findings from experimental activities, using appropriate technical language, relevant calculations and graphs
- assess the reliability of an experimental activity
- evaluate data and methods taking into account factors that affect accuracy and validity.

Our practical investigations are embedded within the Science content as specification points in italics, and are summarized below:

Biology
<i>2.9 practical: investigate food samples for the presence of glucose, starch, protein and fat</i>
<i>2.12 practical: investigate how enzyme activity can be affected by changes in temperature</i>
<i>2.23 practical: investigate photosynthesis, showing the evolution of oxygen from a water plant, the production of starch and the requirements of light, carbon dioxide and chlorophyll</i>
<i>4.2 practical: investigate the population size of an organism in two different areas using quadrats</i>
<i>5.6 practical: investigate the role of anaerobic respiration by yeast in different conditions</i>
Chemistry
<i>1.13 practical: investigate paper chromatography using inks/food colourings</i>
<i>2.14 practical: determine the approximate percentage by volume of oxygen in air using a metal or a non-metal</i>
<i>3.8 practical: investigate temperature changes accompanying some of the following types of change:</i> <ul style="list-style-type: none">• <i>salts dissolving in water</i>• <i>neutralisation reactions</i>• <i>displacement reactions</i>• <i>combustion reactions.</i>
<i>3.15 practical: investigate the effect of changing the surface area of marble chips and of changing the concentration of hydrochloric acid on the rate of reaction between marble chips and dilute hydrochloric acid</i>



Physics

1.5 practical: investigate the motion of everyday objects such as toy cars or tennis balls

3.17 practical: investigate the refraction of light, using rectangular blocks, semi-circular blocks and triangular prisms

6.6 practical: investigate the magnetic field pattern for a permanent bar magnet and between two bar magnets

7.6 practical: investigate the penetration powers of different types of radiation using either radioactive sources or simulations

Suggested practical investigations

The following suggestions are *additional* practical investigations that exemplify the scientific process. They can be used to supplement learners' understanding of biology, chemistry and physics in addition to the practical investigations found in the main body of the content.

Biology

- Investigate human responses to external stimuli.
- Investigate reaction times.
- Investigate the effect of pollutants on plant germination and plant growth.
- Investigate inheritance using suitable organisms or models.
- Investigate the presence of glucose in simulated urine/body fluids.
- Investigate the effect of exercise on heart rate.
- Investigate the relationship between organisms and their environment, using fieldwork techniques.
- Investigate the distribution of organisms in an ecosystem, using sampling techniques including:
 - pooters
 - sweep nets/pond nets
 - pitfall traps and measure environmental factors including:
 - o temperature
 - o light intensity
 - o pH.
- Investigate plant and animal cells with a light microscope.
- Investigate the effect of glucose concentration on rate of anaerobic respiration in yeast.
- Investigate the effect of different factors on bread making.



- Investigate the use of enzymes in washing powders.
- Investigate temperature loss in beakers of hot water of different sizes.

Chemistry

- Investigate the ease of thermal decomposition of carbonates, including calcium carbonate, zinc carbonate and copper carbonate.
- Compare the temperature rise produced when the same volume of water is heated by different fuels.
- Investigate the volume of air used up and products formed when candles are burned.
- Carry out simple neutralisation reactions of acids, using metal oxides, hydroxides and/or carbonates.
- Investigate the rusting of iron.
- Investigate simple oxidation and reduction reactions, such as burning elements in oxygen or competition reactions between metals and metal oxides.
- Investigate the fractional distillation of synthetic crude oil and the ease of ignition and viscosity of the fractions.
- Investigate the products produced from the complete combustion of a hydrocarbon.
- Investigate the properties of a group of elements, e.g. Group 2.
- Investigate the properties of typical ionic compounds.
- Carry out a series of ion tests to identify unknown compounds.
- Build models of simple covalent molecules.
- Investigate the typical properties of simple and giant covalent compounds.
- Investigate the rate of reactions, such as magnesium and hydrochloric acid, or sodium thiosulfate and hydrochloric acid.

Physics

- Investigate the power consumption of low-voltage electrical items.
- Investigate models to show refraction, such as toy cars travelling into a region of sand.
- Investigate the areas beyond the visible spectrum, such as those found by Herschel and Ritter, who discovered infrared and ultraviolet (UV) respectively.
- Investigate the relationship between potential difference (voltage), current and resistance.
- Investigate the relationship between force, mass and acceleration.
- Investigate the forces required to slide blocks along different surfaces, with differing amounts of friction.
- Investigate how crumple zones can be used to reduce the forces in collisions.
- Investigate power by running up the stairs or lifting objects of different weights.
- Investigate the critical angle for Perspex[®]/air, glass/air or water/air boundaries.
- Investigate factors affecting the height of rebound of bouncing balls.



- Investigate the temperature and volume relationship for a gas.
- Investigate the volume and pressure relationship for a gas.
- Investigate the absorption of light by translucent materials in order to simulate the absorption of rays.

Safety is an overriding requirement for all practical work. Centres are responsible for ensuring that whenever their learners complete practical work, appropriate safety procedures are followed.



Mathematical skills

The table below identifies the mathematical skills that will be developed and assessed throughout this qualification. These are not explicitly referenced in the content. Details of the mathematical skills in other science subjects are given for reference:

		B	C	P
1	Arithmetic and numerical computation			
A	Recognise and use numbers in decimal form	✓	✓	✓
B	Recognise and use numbers in standard form	✓	✓	✓
C	Use ratios, fractions, percentages, powers and roots	✓	✓	✓
D	Make estimates of the results of simple calculations, without using a calculator	✓		✓
E	Use calculators to handle $\sin x$ and $\sin^{-1} x$, where x is expressed in degrees			✓
2	Handling data			
A	Use an appropriate number of significant figures	✓	✓	✓
B	Understand and find the arithmetic mean (average)	✓	✓	✓
C	Construct and interpret bar charts	✓	✓	✓
D	Construct and interpret frequency tables, diagrams and histograms	✓		✓
E	Understand the principles of sampling as applied to scientific data	✓		
F	Understand simple probability	✓	✓	✓
G	Understand the terms mode and median	✓		
H	Use a scatter diagram to identify a pattern or trend between two variables	✓	✓	✓
I	Make order of magnitude calculations	✓	✓	✓
3	Algebra			
A	Understand and use the symbols $<$, $>$, \propto , \sim		✓	✓
B	Change the subject of an equation	✓	✓	✓
C	Substitute numerical values into algebraic equations using appropriate units for physical quantities	✓	✓	✓
D	Solve simple algebraic equations	✓	✓	✓
4	Graphs			
A	Translate information between graphical and numerical form	✓	✓	✓
B	Understand that $y = mx + c$ represents a linear relationship		✓	✓
C	Plot two variables (discrete and continuous) from experimental or other data	✓	✓	✓
D	Determine the slope and intercept of a linear graph	✓	✓	✓
E	Understand, draw and use the slope of a tangent to a curve as a measure of rate of change		✓	✓
F	Understand the physical significance of area between a curve and the x -axis, and measure it by counting squares as appropriate			✓



		B	C	P
5	Geometry and trigonometry			
A	Use angular measures in degrees			✓
B	Visualise and represent 2D and 3D objects, including two dimensional representations of 3D objects			✓
C	Calculate areas of triangles and rectangles, surface areas and volumes of cubes	✓		✓

Science (Single Award) (2017) (4SS0)

Getting Started Guide



The Periodic Table

The Periodic Table of the Elements

	1	2	3	4	5	6	7	0										
	7 Li lithium 3	9 Be beryllium 4	11 Na sodium 11	12 Mg magnesium 12	13 Al aluminium 13	14 N nitrogen 7	15 P phosphorus 15	16 S sulfur 16	17 Cl chlorine 17	18 Ar argon 18								
	19 K potassium 19	20 Ca calcium 20	23 Sc scandium 21	24 Ti titanium 22	25 V vanadium 23	26 Cr chromium 24	27 Mn manganese 25	28 Fe iron 26	29 Ni nickel 28	30 Cu copper 29	31 Zn zinc 30	32 Ga gallium 31	33 Ge germanium 32	34 As arsenic 33	35 Se selenium 34	36 Br bromine 35	37 Kr krypton 36	
	37 Rb rubidium 37	38 Sr strontium 38	39 Y yttrium 39	40 Zr zirconium 40	41 Nb niobium 41	42 Mo molybdenum 42	43 Tc technetium [98]	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
	55 Cs caesium 55	56 Ba barium 56	57 La* lanthanum 57	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium [209]	85 At astatine [210]	86 Rn radon [222]
	[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	Elements with atomic numbers 112-116 have been reported but not fully authenticated						

1	H	1
	hydrogen	

relative atomic mass
atomic symbol
name
atomic (proton) number

* The lanthanoids (atomic numbers 58-71) and the actinoids (atomic numbers 90-103) have been omitted.

The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.

Science (Single Award) (2017) (4SS0)

Getting Started Guide



Physics formulae for relationships

The relationships listed below will **not** be provided for students either in the form given or in rearranged form.

- (1) the relationship between average speed, distance moved and time taken:

$$\text{average speed} = \frac{\text{distance moved}}{\text{time taken}}$$

- (2) the relationship between force, mass and acceleration:

$$\text{force} = \text{mass} \times \text{acceleration}$$

- (3) the relationship between acceleration, change in velocity and time taken:

$$\text{acceleration} = \frac{\text{change in velocity}}{\text{time taken}}$$

- (4) the relationship between work done, force and distance moved:

$$\text{work done} = \text{force} \times \text{distance moved}$$

- (5) the energy relationships:

$$\text{energy transferred} = \text{work done}$$

$$\text{kinetic energy} = \frac{1}{2} \times \text{mass} \times \text{speed}^2$$

$$\text{gravitational potential energy} = \text{mass} \times g \times \text{height}$$

- (6) the relationship between mass, weight and gravitational field strength:

$$\text{weight} = \text{mass} \times \text{gravitational field strength}$$

- (7) the relationship between an applied force, the area over which it acts and the resulting pressure:

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$



(8) the relationship between charge, current, voltage, resistance and electrical power:

$$\text{charge} = \text{current} \times \text{time}$$

$$\text{voltage} = \text{current} \times \text{resistance}$$

$$\text{electrical power} = \text{voltage} \times \text{current}$$

(9) the relationship between speed, frequency and wavelength of wave:

$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

(14) the relationship for efficiency:

$$\text{efficiency} = \frac{\text{useful energy output}}{\text{total energy output}} \times 100\%$$



Electrical circuit symbols

Description	Symbol
Conductors crossing with no connection	
Junction of conductors	
Open switch	
Cell	
Battery of cells	
Power supply (DC)	
Power supply (AC)	
Transformer	
Ammeter	
Voltmeter	
Fixed resistor	
Variable resistor	

Description	Symbol
Heater	
Thermistor	
Light-dependent resistor (LDR)	
Diode	
Light-emitting diode (LED)	
Lamp	
Loudspeaker	
Microphone	
Electric bell	
Earth or ground	
Motor	
Generator	
Fuse/circuit breaker	

Although these are the forms of circuit symbols that will be used in examination papers, there may be other internationally agreed symbols acceptable in learner answers.



Assessment guidance

Assessment requirements

Paper number	Level	Assessment information	Number of marks allocated in the paper
Paper 1	1/2	Assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson. The paper is weighted at 33.3% of the qualification. A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions.	60
Paper 2	1/2	Assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson. The paper is weighted at 33.3% of the qualification. A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions.	60
Paper 3	1/2	Assessed through a 1-hour and 10-minute written examination paper set and marked by Pearson. The paper is weighted at 33.3% of the qualification. A mixture of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions.	60

The total number of marks for this qualification is 180. This total is obtained by adding up the marks for Paper 1B, Paper 1C and Paper 1P (each out of 60 marks). The marks for the papers are not scaled. Based on the overall mark, students will be awarded a grade. The grades available range from 9 to 1, where 9 is the highest grade.

Science (Single Award) (2017) (4SS0)

Getting Started Guide



Assessment objectives and weightings

		International GCSE
AO1	Knowledge and understanding of science	38–42%
AO2	Application of knowledge and understanding, analysis and evaluation of science	38–42%
AO3	Experimental skills, analysis and evaluation of data and methods in science	19–21%
		100%

Relationship of assessment objectives to units

Unit number	Assessment objective		
	AO1	AO2	AO3
Paper 1	12.7–14.0%	12.7–14.0%	6.3–7.0%
Paper 2	12.7–14.0%	12.7–14.0%	6.3–7.0%
Paper 3	12.7–14.0%	12.7–14.0%	6.3–7.0%
Total for International GCSE	38–42%	38–42%	19–21%

Sample assessment materials

Sample and mark schemes can be found in the Pearson Edexcel International GCSE in Science (Single Award) Sample Assessment Materials (SAMs) document.

Calculators

Learners will be expected to have access to a suitable electronic calculator for all unit assessments. Calculators that allow for the retrieval of text or formulae or QWERTY keyboards will not be allowed for use in examinations.

Command word taxonomy

This table lists the command words that could be used in the examinations for this qualification and their definitions



Command word	Definition
Add/Label	Requires the addition or labelling of a stimulus material given in the question, for example labelling a diagram or adding units to a table.
Calculate	Obtain a numerical answer, showing relevant working.
Comment on	Requires the synthesis of a number of variables from data/information to form a judgement.
Complete	Requires the completion of a table/diagram.
Deduce	Draw/reach conclusion(s) from the information provided.
Describe	To give an account of something. Statements in the response need to be developed, as they are often linked but do not need to include a justification or reason.
Determine	The answer must have an element that is quantitative from the stimulus provided, or must show how the answer can be reached quantitatively. To gain maximum marks, there must be a quantitative element to the answer.
Design	Plan or invent a procedure from existing principles/ideas.
Discuss	<ul style="list-style-type: none"> Identify the issue/situation/problem/argument that is being assessed within the question. Explore all aspects of an issue/situation/problem/argument. Investigate the issue/situation etc. by reasoning or argument.
Draw	Produce a diagram either using a ruler or freehand.
Estimate	Find an approximate value, number or quantity from a diagram/given data or through a calculation.
Evaluate	Review information (e.g. data, methods) then bring it together to form a conclusion, drawing on evidence including strengths, weaknesses, alternative actions, relevant data or information. Come to a supported judgement of a subject's quality and relate it to its context.
Explain	An explanation requires a justification/exemplification of a point. The answer must contain some element of reasoning/justification – this can include mathematical explanations.
Give/State/Name	All of these command words are really synonyms. They generally all require recall of one or more pieces of information.
Give a reason/reasons	When a statement has been made and the requirement is only to give the reason(s) why.
Identify	Usually requires some key information to be selected from a given stimulus/resource.



Command word	Definition
Justify	Give evidence to support (either the statement given in the question or an earlier answer).
Plot	Produce a graph by marking points accurately on a grid from data that is provided and then draw a line of best fit through these points. A suitable scale and appropriately labelled axes must be included if these are not provided in the question.
Predict	Give an expected result.
Show that	Verify the statement given in the question.
Sketch	Produce a freehand drawing. For a graph, this would need a line and labelled axes with important features indicated. The axes are not scaled.
State what is meant by	When the meaning of a term is expected but there are different ways for how these can be described.
Suggest	Use your knowledge to propose a solution to a problem in a novel context.
Verb preceding a command word	
Analyse the data/graph to explain	Examine the data/graph in detail to provide an explanation.
Multiple choice questions	
What, Why, Which	Direct command words used for multiple-choice questions.



Planning

We have provided a course planner and an editable scheme of work to support you in delivering this qualification.

This section contains a 2-year course planner for the International GCSE Science (Single Award) (2017) qualification. It follows the specification and scheme of work to cover each of the units.

The course planner summarises what can be covered in each term to enable completion of the content and preparation for assessment at the end of each year. It assumes that each year is split into 3 terms and that each week accounts for roughly 2 Guided Learning Hours over 60 weeks of teaching to give a total of 120 hours for the Science (Double Award) (2017). How this time is divided up to cover the three sciences will vary from centre to centre, but this planner is based on dividing the total time into roughly three equal parts.

This is only a suggested course planner with suggested timings, and it does not need to be followed. You may decide to start teaching content earlier if you would like more time. You will find a more detailed lesson plan in the scheme of work document, which gives suggested teaching times for each unit. This is editable so that you can customise it to meet your own needs.

Year	Term	Week	Topic/Sub-topic	Spec points/practicals
Chemistry				
1	1	1	<u>Section 1: Principles of chemistry</u> a) States of matter b) Elements, compounds and mixtures	1.1, 1.2, 1.3, 1.8, 1.9
1	1	2	b) Elements, compounds and mixtures	1.10, 1.11, 1.12, 1.13 <i>Practical: investigate paper chromatography using inks/food colourings</i>
1	1	3	c) Atomic structure d) The Periodic Table	1.14, 1.15, 1.16, 1.17, 1.18, 1.21
1	1	4	f) Ionic bonding	1.37, 1.38, 1.39, 1.41, 1.42



1	1	5	Consolidation & Assessment Feedback	
1	1	6	e) Chemical formulae, equations and calculations g) Covalent bonding	1.25, 1.26, 1.44, 1.47, 1.49
1	1	7	<u>Section 2: Inorganic chemistry</u> a) Group 1 (alkali metals) b) Group 7 (halogens)	2.1, 2.2, 2.3, 2.5, 2.6
1	1	8	c) Gases in the atmosphere	2.9, 2.10, 2.11, 2.13, 2.14 <i>Practical: determine the approximate percentage by volume of oxygen in air using a metal or a non-metal</i>
1	1	9	d) Reactivity series	2.15, 2.17, 2.18, 2.19
1	1	10	e) Acids and alkalis Consolidation & assessment	2.28, 2.29, 2.30, 2.31, 2.32
1	1	11	Feedback	
Physics				
1	1	11	<u>Section 1: Forces and movement</u> a) Units b) Movement and position	1.1, 1.3, 1.4
1	2	1	b) Movement and position	1.5, 1.6, 1.7, 1.8, 1.9 <i>Practical: investigate the motion of everyday objects such as toy cars or tennis balls</i>
1	2	2	c) Forces and movement	1.11, 1.12, 1.16, 1.17, 1.18
1	2	3	c) Forces and movement <u>Section 2: Electricity</u> c) Current and voltage in circuits	1.19, 1.20, 2.12, 2.14, 2.16
1	2	4	a) Units c) Current and voltage in circuits	2.1, 2.8, 2.9, 2.10, 2.13, 2.19



1	2	5	b) Mains electricity Consolidation & assessment	2.4, 2.6
1	2	6	Feedback <u>Section 3: Waves</u> a) Units b) Properties of waves	3.1, 3.3, 3.4
1	2	7	b) Properties of waves c) The electromagnetic spectrum	3.5, 3.7, 3.10, 3.11, 3.12, 3.13
1	2	8	b) Properties of waves c) The electromagnetic spectrum d) Light and sound	3.9, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15, 3.17 <i>Practical: investigate the refraction of light, using rectangular blocks, semicircular blocks and triangular prisms</i>
1	2	9	d) Light and sound <u>Section 4: Energy and energy transfers</u> a) Units b) Energy transfers	3.20, 3.21, 3.23, 4.1, 4.2, 4.3
1	1	8	c) Gases in the atmosphere	2.9, 2.10, 2.11, 2.13, 2.14 <i>Practical: determine the approximate percentage by volume of oxygen in air using a metal or a non-metal</i>
1	1	9	d) Reactivity series	2.15, 2.17, 2.18, 2.19
1	1	10	e) Acids and alkalis Consolidation & assessment	2.28, 2.29, 2.30, 2.31, 2.32
1	1	11	Feedback	
Physics				
1	1	11	<u>Section 1: Forces and movement</u> a) Units b) Movement and position	1.1, 1.3, 1.4

Science (Single Award) (2017) (4SS0)

Getting Started Guide



1	2	1	b) Movement and position	1.5, 1.6, 1.7, 1.8, 1.9 <i>Practical: investigate the motion of everyday objects such as toy cars or tennis balls</i>
1	2	2	c) Forces and movement	1.11, 1.12, 1.16, 1.17, 1.18
1	2	3	c) Forces and movement <u>Section 2: Electricity</u> c) Current and voltage in circuits	1.19, 1.20, 2.12, 2.14, 2.16
1	2	4	a) Units c) Current and voltage in circuits	2.1, 2.8, 2.9, 2.10, 2.13, 2.19
1	2	5	b) Mains electricity Consolidation & assessment	2.4, 2.6
1	2	6	Feedback <u>Section 3: Waves</u> a) Units b) Properties of waves	3.1, 3.3, 3.4
1	2	7	b) Properties of waves c) The electromagnetic spectrum	3.5, 3.7, 3.10, 3.11, 3.12, 3.13
1	2	8	b) Properties of waves c) The electromagnetic spectrum d) Light and sound	3.9, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15, 3.17 <i>Practical: investigate the refraction of light, using rectangular blocks, semicircular blocks and triangular prisms</i>
1	2	9	d) Light and sound <u>Section 4: Energy and energy transfers</u> a) Units b) Energy transfers	3.20, 3.21, 3.23, 4.1, 4.2, 4.3
1	2	10	b) Energy transfers c) Work and power	4.4, 4.5, 4.11, 4.12, 4.13
1	3	1	c) Work and power	4.14, 4.15, 4.16, 4.17
1	3	2	Consolidation & assessment	



			Feedback	
Biology				
1	3	3	<u>Section 1: The nature and variety of living organisms</u> a) Characteristics of living organisms b) Variety of living organisms	1.1, 1.2, 1.3
		4	b) Variety of living organisms <u>Section 2: Structures and functions in living organisms</u> a) Levels of organisation b) Cell structure	1.4, 2.1, 2.2, 2.3, 2.4
1	3	5	c) Biological molecules	2.7, 2.8, 2.9 <i>Practical: investigate food samples for the presence of glucose, starch, protein and fat</i>
1	3	6	c) Biological molecules d) Movement of substances into and out of cells	2.10, 2.11, 2.12, 2.13, 2.15 <i>Practical: investigate how enzyme activity can be affected by changes in temperature</i>
1	3	7	d) Movement of substances into and out of cells Consolidation & assessment	2.16
1	3	8	Feedback e) Nutrition	2.18, 2.19, 2.20
1	3	9	e) Nutrition	2.21, 2.23 <i>Practical: investigate photosynthesis, showing the evolution of oxygen from a water plant, the production of starch and the requirements of light, carbon dioxide and chlorophyll</i>



1	3	10	e) Nutrition f) Respiration	2.27, 2.29, 2.34, 2.35, 2.36, 2.37, 2.38
2	1	1	g) Gas exchange h) Transport	2.46, 2.47, 2.48, 2.51, 2.52, 2.59, 2.60, 2.61
2	1	2	h) Transport	2.62, 2.65, 2.68, 2.69
2	1	3	Consolidation & assessment Feedback	
Chemistry				
2	1	4	<u>Section 2: Inorganic chemistry</u> f) Chemical tests	2.44, 2.45, 2.46
2	1	5	f) Chemical tests <u>Section 3: Physical chemistry</u> a) Energetics	2.48, 2.49, 3.1, 3.2, 3.3
2	1	6	a) Energetics	3.2, 3.3, 3.8 <i>Practical: investigate temperature changes accompanying some of the following types of change:</i> <ul style="list-style-type: none"> • Salts dissolving in water • Neutralisation reactions • Displacement reactions • Combustion reactions
2	1	7	b) Rates of reaction	3.9, 3.10, 3.12, 3.15 <i>Practical: investigate the effect of changing the surface area of marble chips and of changing the concentration of hydrochloric acid on the rate of reaction between marble chips and dilute hydrochloric acid</i>
2	1	8	<u>Section 4: Organic chemistry</u> a) Introduction b) Crude oil c) Alkanes	4.1, 4.2, 4.7, 4.9, 4.10, 4.19, 4.20, 4.21



2	1	9	a) Introduction b) Crude oil d) Alkenes	4.2, 4.11, 4.12, 4.13, 4.23, 4.24, 4.25, 4.26, 4.28
2	1	10	b) Crude oil c) Synthetic polymers	4.14, 4.15, 4.16, 4.44, 4.45, 4.46, 4.47
2	1	11	Consolidation & assessment Feedback	
Physics				
2	2	1	<u>Section 5: Solids, liquids, and gases</u> a) Units b) Density and pressure c) Ideal gas molecules	5.1, 5.5, 5.6, 5.15, 5.16, 5.17, 5.18
2	2	2	c) Ideal gas molecules <u>Section 6: Magnetism and electromagnetism</u> a) Units b) Magnetism	5.19, 5.20, 6.1, 6.4, 6.6, 6.7 <i>Practical: investigate the magnetic field pattern for a permanent bar magnet and that between bar magnets</i>
2	2	3	c) Electromagnetism	6.8, 6.12, 6.13, 6.14
2	2	4	<u>Section 7: Radioactivity and particles</u> a) Units b) Radioactivity	7.1, 7.2, 7.3, 7.4, 7.5, 7.6 <i>Practical: investigate the penetration powers of different types of radiation using either radioactive sources or simulations</i>
2	2	5	b) Radioactivity	7.10, 7.12, 7.14, 7.15, 7.16
2	2	6	c) Fission and fusion <u>Section 8: Astrophysics</u> a) Units b) Motion in the universe	7.17, 7.18, 7.19, 7.22, 7.25, 8.1, 8.2, 8.3, 8.4, 8.5
2	2	7	c) Stellar evolution Consolidation & assessment	8.7, 8.8, 8.9



Biology				
2	2	8	<u>Section 3: Reproduction and inheritance</u> a) Reproduction	3.1, 3.2, 3.3, 3.4, 3.8, 3.13
2	2	9	b) Inheritance	3.15, 3.19, 3.20, 3.23, 3.25, 3.26, 3.27, 3.31
2	2	10	b) Inheritance <u>Section 4: Ecology and the environment</u> a) The organism in the environment	3.33, 3.38, 4.1, 4.5
2	3	1	a) The organism in the environment b) Feeding relationships	4.2, 4.6, 4.7, 4.8, 4.9 <i>Practical: investigate the population size of an organism in two different areas using quadrats</i>
2	3	2	c) Cycles within ecosystems <u>Section 5: Use of biological resources</u> a) Food production	4.10, 5.1, 5.2
2	3	3	a) Food production b) Genetic modification (genetic engineering)	5.5, 5.6, 5.12, 5.13 <i>Practical: investigate the role of anaerobic respiration by yeast in different conditions</i>
2	3	4	b) Genetic modification (genetic engineering) Consolidation & assessment	5.14, 5.15, 5.16
2	3	5	Feedback Revision	
2	3	6	Revision	

We also have a dedicated scheme of work for this qualification [here](#).



Delivery of the qualification – transferable skills

The need for transferable skills

In recent years, higher education institutions and employers have consistently flagged the need for learners to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as ‘the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning.’[1]

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, we identified the National Research Council’s (NRC) framework [2] as the most evidence-based and robust skills framework, and have used this as a basis for our adapted skills framework.



The framework includes cognitive, intrapersonal skills and interpersonal skills.

The NRC framework is included alongside literacy and numeracy skills.

The skills have been interpreted for this specification to ensure they are appropriate for the subject. All of the skills listed are evident or accessible in the teaching, learning and / or assessment of the qualification. Some skills are directly assessed. Pearson materials will

support you in identifying these skills and developing these skills in learners.

A full subject interpretation of each skill, with mapping to show opportunities for learner development is given on the subject pages of our website: qualifications.pearson.com

For information about Pearson Qualifications, including Pearson Edexcel and BTEC qualifications, visit [qualifications.pearson.com](https://www.pearson.com/qualifications)

Edexcel and BTEC are registered trademarks of Pearson Education Limited

Pearson Education Limited. Registered in England and Wales No. 872828
Registered Office: 80 Strand, London WC2R 0RL

VAT Reg No GB 278 537121

Getty Images: Alex Belmonlinsky

