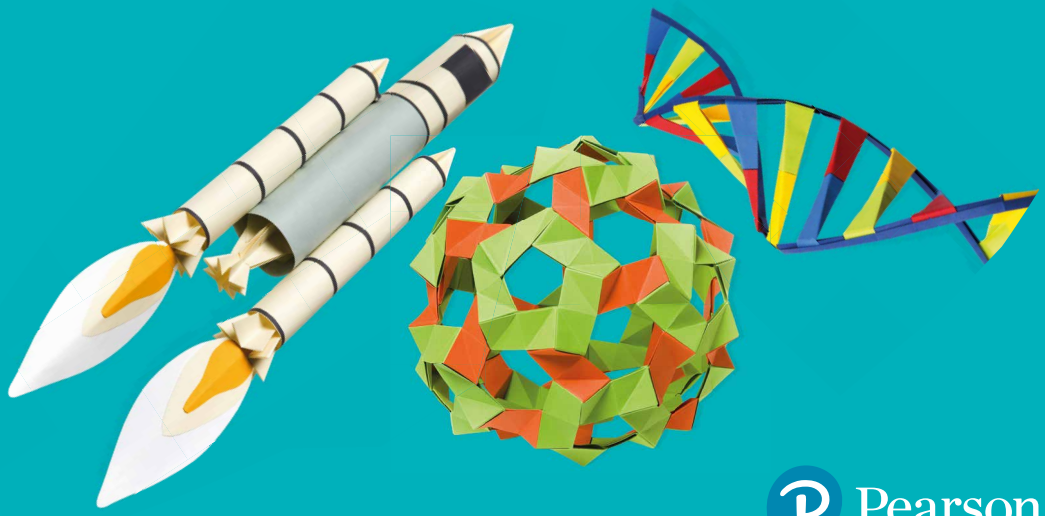
edexcel

Entry Level Certificate in Further Science

Specification

Pearson Edexcel Entry Level Certificate in Further Science (NSF0)

First certification from June 2018 | Issue 1



Pearson

Contents

1 Introduction

Why choose the Pearson Edexcel Entry Level Certificate in Further Science?

We've listened to feedback from all parts of the science community and taken this redevelopment as an opportunity to redesign the Entry Level Certificate so that it complements the GCSE (9–1) Sciences, and supports every student in their enjoyment of science and success in their studies.

Our Entry Level Certificate in Further Science has been designed to closely match the programme of study of and provide a progression route to GCSE Combined Science. The Certificate supports advancement in science by cementing core understanding and maximising engagement with the subject.

Co-teachability with GCSE Combined Science – key aspects of the GCSE Combined Science qualification are reflected in the Entry Level Certificate to help with co-teachability, such as careful selection of practicals and alignment of topics in the two qualifications. This ensures that students can retain the option to attempt the GCSE examinations should they progress well through the Entry Level course.

Assessments designed to encourage progression to GCSE – assessments prepare students for GCSE by drawing on key elements such as the assessment of practical skills, while retaining the flavour of Entry Level with assessments that can be taken at any time during the course.

Supporting you in planning and implementing this qualification

Planning

- Our **Getting Started** guide gives you an overview of the new Entry Level Certificate qualification to help you to get to grips with the changes to content and assessment and to help you understand what these changes mean for you and your students.
- We will give you an editable **course planner** and **scheme of work** that you can adapt to suit your department.

Teaching and learning

There will be lots of free teaching and learning support to help you deliver the new qualification, including:

- a **free teacher guide**, which will include information on language used at each level, more on the assessment of practical skills and general information on the structure of the qualification
- free practical support to help prepare for the changes to practical assessment.

Preparing for exams

We provide a range of support to help you prepare your students for the assessments, including:

- sample assessment materials to support formative assessment practice
- sample practical questions with commentary to help support the inclusion of practical skills in the assessments.

Get help and support

Our subject advisor service, led by Stephen Nugus and Julius Edwards, will ensure that you receive help and guidance, it also allows you to share ideas and information with other teachers.

You can sign up to receive e-newsletters from Kathryn Booth (Head of Science and Technologies team) for qualification updates and product and service news (scienceteamupdates@pearson.com).

Find all of this and more at quals.pearson.com/ELC.

Qualification at a glance

Content and assessment overview

The Pearson Edexcel Entry Level Certificate in Further Science consists of six externally-set tests.

Content overview
Each of the six externally-set tests focuses on a specific area of content from the specification, shown as follows.
Paper 1: Biology 2A – Plants and ecosystems Plants, Ecosystems
Paper 2: Biology 2B – Human biology Hormones, Regulation, Circulation
Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction Group 1, Group 7, Group 0, Heat energy changes in chemical reactions, Rates of reaction
Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere Fuels, Earth's atmosphere
Paper 5: Physics 2A – Electricity and magnets Electrical circuits, Magnets, Electricity in the home
Paper 6: Physics 2B – Energy and particles Work and energy, Particles, Stretching

Information for each test
Externally-set tests, administered and marked by the centre and moderated by Pearson. ***There is no set time for when each test is to be completed or for how long the student takes to complete each test. Please see page 22 for more information.*** ***16.67% of the qualification*** ***25 marks***
Assessment overview Students should answer all questions. The papers consist of: multiple-choice, closed-response, graphical and short-open response questions, and calculations. Calculators may be used in the test. Information on the use of calculators during the examinations for this qualification can be found in *Appendix 2: Calculators*.

See *Appendix 5: Codes* for a description of all codes relevant to this qualification.

2 Subject content and assessment information

The Pearson Edexcel Entry Level Certificate in Science and the Pearson Edexcel Entry Level in Further Science cover the majority of the Key Stage 4 programme of study in science.

Qualification aims and objectives

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

- acquire a body of basic scientific knowledge and an understanding of some important scientific ideas consistent with the programme of study
- develop basic experimental and investigative abilities
- develop a basic understanding of some of the important technological and environmental applications of science, and the economic, ethical and social implications consistent with the programme of study
- develop an interest in science, leading to further study at a higher level, for example the Edexcel GCSE in Combined Science.

Working scientifically

When studying the content across the biology, chemistry and physics topics, students should also develop the understanding and experience of working scientifically. This is detailed in full in *Appendix 3: Working scientifically*.

Co-teaching with GCSE

This qualification is designed to be co-taught with the Pearson Edexcel Level 1/Level 2 GCSE (9–1) in Combined Science. The common topic areas from the Edexcel Level 1/Level 2 GCSE (9–1) in Combined Science are B2, C2 and P2. In the content section, we have added a column to show the reference to where the content links to the Edexcel GCSE in Combined Science (CS ref), where applicable.

Suggested practicals

Suggested practicals have been given at the end of relevant topics. These are not compulsory practicals but are suggestions for activities to improve students' practical skills. The majority of these practicals are linked to the core practicals in the Pearson Edexcel Level 1/Level 2 GCSE (9–1) in Combined Science specification. To aid co-teaching, these links are shown next to the relevant suggested practical.

Sample assessment materials

A sample test and mark scheme for all of these tests can be found in the *Pearson Edexcel Entry Level Certificate in Further Science Sample Assessment Materials (SAMs)* document on our website. This published SAMs document will contain tests and mark schemes for:

- Paper 1: Biology 2A – Plants and ecosystems
- Paper 2: Biology 2B – Human biology
- Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction
- Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere
- Paper 5: Physics 2A – Electricity and magnets
- Paper 6: Physics 2B – Energy and particles.

Live materials

The live tests and mark schemes for this qualification are available from October 2017 onwards for:

- Paper 1: Biology 2A – Plants and ecosystems
- Paper 2: Biology 2B – Human biology
- Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction
- Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere
- Paper 5: Physics 2A – Electricity and magnets
- Paper 6: Physics 2B – Energy and particles.

We will provide photocopiable tests and mark schemes on the secure area of our website.

Biology

Paper 1: Biology 2A – Plants and ecosystems

Content

Students should:		CS ref
2A.1	Recall that plants and green algae are organisms that undertake photosynthesis	6.1
2A.2	Describe photosynthetic organisms as the main producers of food, and therefore biomass	6.1
2A.3	Recall photosynthesis as a reaction that uses light energy to react carbon dioxide and water to produce glucose and oxygen	6.2
2A.4	Recall the word equation for photosynthesis	
2A.5	Recall that the rate of photosynthesis is affected by: a temperature b light intensity c carbon dioxide concentration	6.3
2A.6	Describe the process of diffusion as the movement of particles from an area of higher concentration to an area of lower concentration	1.15
2A.7	Describe the process of osmosis as the movement of water molecules from an area of higher concentration to an area of lower concentration across a semi-permeable membrane	1.15
2A.8	Describe active transport as a process that uses energy to move a substance from an area of lower concentration to an area of higher concentration	1.15
2A.9	Recall that diffusion, osmosis and active transport are all used to move substances across a cell membrane into a cell	1.15
2A.10	Describe how the large surface area of the root hair cells helps them to absorb water and mineral ions from the soil	6.7
2A.11	Describe the transport of water and mineral ions up the stem of a plant from the roots: a in a part of the plant called the xylem b due to loss of water from the surface of the leaf (transpiration)	6.9
2A.12	Recall that sugar is transported around the plant in the phloem	6.10
2A.13	Recall that plants use sucrose as an energy store	
2A.14	Describe the different levels of organisation in an ecosystem from individual organisms, populations, communities, to the whole ecosystem	9.1

Students should:	CS ref
2A.15 Describe how the organisms in a community can be affected by: a temperature b light c water d pollutants	9.2
2A.16 Explain how communities can be affected by other organisms through: a competition for resources b predation	9.2
2A.17 Recall that a community often survives because organisms within it depend on each other (interdependence)	9.3
2A.18 Describe methods for investigating the number of organisms in a given area, including: a quadrats b pitfall-traps	9.6
2A.19 Describe the benefits of the conservation of animal species, including: a preserving the natural habitat b increasing biodiversity c promoting wildlife tourism (an economic benefit)	9.10
2A.20 Recall the benefits of reforestation, including: a providing a habitat for organisms b increasing biodiversity c reducing the effects of climate change	9.10
2A.21 Describe the importance of the carbon cycle, including: a carbon dioxide entering the atmosphere through respiration or combustion b carbon dioxide leaving the atmosphere through photosynthesis c the role of microorganisms as decomposers	9.13

Suggested practicals

- Investigate the effect of pollutants on plant germination and plant growth.
- Investigate osmosis in potatoes (link to CS 1.16).
- Investigate the effect of light intensity on the rate of photosynthesis (link to CS 5.5).
- Investigate the relationship between organisms and their environment, using field-work techniques, including quadrats and belt transects, and pitfall-traps (link to CS 9.5).

Paper 2: Biology 2B – Human biology

Content

Students should:	CS ref
2B.1 Recall that hormones are: a chemical messengers b produced in endocrine glands c transported in the blood	7.1
2B.2 Recall the hormones produced in the following endocrine glands: a ovaries (oestrogen and progesterone) b testes (testosterone) c pancreas (insulin)	7.1
2B.3 Describe the stages of the menstrual cycle, including the roles of the hormones oestrogen and progesterone, in the control of the menstrual cycle	7.4
2B.4 Recall that contraceptives are used to prevent pregnancy	7.6
2B.5 Recall that the (female) contraceptive pill: a contains hormones (progesterone and oestrogen) b affects the menstrual cycle by preventing ovulation	7.6
2B.6 Describe the use of (male) condoms as: a a barrier method of contraception b a method that can prevent the spread of STIs (sexually transmitted infections)	7.7
2B.7 Recall that organisms maintain a constant internal environment in response to internal and external change, including: a body temperature b water c blood sugar level	7.9
2B.8 Recall that insulin is a hormone that has a role in controlling blood sugar levels	7.13
2B.9 Describe type 1 diabetes as a condition that: a is caused because cells in the pancreas that produce insulin do not function b is controlled by insulin injections	7.15
2B.10 Describe type 2 diabetes as a condition that: a is often caused because the body does not respond to the insulin produced b is linked to factors such as diet and obesity c can be controlled by maintaining a low-sugar diet and taking exercise d has a number of side-effects, such as blindness	7.16

Students should:	CS ref
2B.11 Recall that enzymes are biological molecules that help the body break down: a carbohydrates into simple sugars b proteins to amino acids	1.12
2B.12 Describe the mechanism of enzyme action, including: a the active site b enzymes being specific for a particular reaction	1.7
2B.13 Describe the effects of temperature on enzyme activity	1.9
2B.14 Recall that enzymes can be denatured at high temperatures because of changes in the shape of the active site	1.8
2B.15 Describe the need to transport substances into and out of a range of organisms, including oxygen, carbon dioxide, water, dissolved food molecules	8.1
2B.16 Describe how alveoli are adapted for gas exchange by diffusion between air in the lungs and blood in capillaries	8.3
2B.17 Describe how the components of the blood are related to their function: a red blood cells, for carrying oxygen to muscles b white blood cells, for immunity to infections c plasma, for transporting dissolved substances d platelets, for helping the process of blood clotting	8.6
2B.18 Describe how the structure of the blood vessels is related to their function, including: a arteries, with thick muscular walls for carrying blood away from the heart under high pressure b veins, with large diameter to allow flow of blood back to heart, and valves to prevent backflow c capillaries, with thin walls to allow exchange of materials with cells	8.7
2B.19 Describe how the structure of the heart is related to its function, including: a aorta, to carry oxygenated blood away from the heart into the body b vena cava, to carry deoxygenated blood from the body back to the heart c pulmonary artery and vein, to carry blood to and from the lungs d heart valves, to prevent blood flowing the wrong way round the heart	8.8
2B.20 Describe respiration as a reaction that occurs continuously in living cells to release energy	8.9
2B.21 Recall aerobic respiration as the process where glucose and oxygen react to produce carbon dioxide and water, and release energy	8.9

Suggested practicals

- Investigate the effect of pH on enzyme activity (link to CS 1.10).
- Investigate the rate of respiration in living organisms (link to CS 8.11).

Chemistry

Topics common to Chemistry 2A and Chemistry 2B

Content

Students should:		CS ref
0.1	Recall the formulae of elements and simple compounds in this specification	0.1
0.2	Write word equations	0.2
0.3	Describe the use of hazard symbols on containers: a to indicate the dangers associated with the contents b to inform people about safe working precautions with these substances in the laboratory	0.5
0.4	Recognise the risks in a practical procedure and suggest suitable precautions for a range of practicals, including those mentioned in this specification	0.6

Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction

Content

Group 1

Students should:		CS ref
2A.1	Recall that some elements are classified as alkali metals (group 1), halogens (group 7) or noble gases (group 0), based on their position in the periodic table	6.1
2A.2	Recall that alkali metals a are soft b have relatively low melting points	6.2
2A.3	Describe the reactions of lithium, sodium and potassium with water	6.3
2A.4	Describe the pattern in reactivity of the alkali metals, lithium, sodium and potassium, with water; and use this pattern to predict the reactivity of other alkali metals	6.4

Group 7

Students should:		CS ref
2A.5	Recall the colours and physical states of chlorine, bromine and iodine at room temperature	6.6
2A.6	Describe the pattern in the physical properties of the halogens, chlorine, bromine and iodine, and use this pattern to predict the physical properties of other halogens	6.7
2A.7	Describe the chemical test for chlorine	6.8
2A.8	Describe the reactions of the halogens, chlorine, bromine and iodine, with metals to form metal halides, and use this pattern to predict the reactions of other halogens	6.9

Group 0

Students should:		CS ref
2A.9	Explain why the noble gases are chemically inert, compared with the other elements, in terms of the arrangement of their electrons	6.14
2A.10	Describe how the uses of noble gases depend on their inertness, low density and/or non-flammability	6.15

Heat energy changes in chemical reactions

Students should:	CS ref
2A.11 Recall that changes in heat energy accompany the following changes: a salts dissolving in water b neutralisation reactions c combustion and that, when these reactions take place, temperature changes can be measured to reflect the heat changes	7.9 a, b
2A.12 Describe an exothermic change or reaction as one in which heat energy is given out	7.10
2A.13 Describe an endothermic change or reaction as one in which heat energy is taken in	7.11

Rates of reaction

Students should:	CS ref
2A.14 Explain how reactions occur when particles collide and that rates of reaction are increased when the frequency of collisions is increased	7.3
2A.15 Interpret graphs of mass, volume or concentration of reactant or product against time	7.5
2A.16 Explain the effects on rates of reaction of changes in temperature, concentration, surface area in terms of frequency of collisions between particles	7.4
2A.17 Describe a catalyst as a substance that speeds up the rate of a reaction without altering the products of the reaction, without undergoing a permanent change itself	7.6
2A.18 Recall that enzymes are biological catalysts	7.8

Suggested practicals

- Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by measuring the production of a gas (in the reaction between hydrochloric acid and marble chips) (link to CS 7.1a).

Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere

Content

Fuels

Students should:	CS ref
2B.1 Recall that hydrocarbons are compounds that contain carbon and hydrogen only	8.1
2B.2 Describe crude oil as: a a complex mixture of hydrocarbons b an important source of useful substances (fuels and feedstock for the petrochemical industry) c a finite resource	8.2
2B.3 Describe the separation of crude oil into fractions by the process of fractional distillation	8.3
2B.4 Recall the names and uses of the following fractions: a gases, used in domestic heating and cooking b petrol, used as fuel for cars c kerosene, used as fuel for aircraft d diesel oil, used as fuel for some cars and trains e fuel oil, used as fuel for large ships and in some power stations f bitumen, used to surface roads and roofs	8.4
2B.5 Describe the complete combustion of hydrocarbon fuels as a reaction in which: a carbon dioxide and water are produced b energy is given out	8.7
2B.6 Recall that the incomplete combustion of hydrocarbon fuels can produce carbon and carbon monoxide	8.8
2B.7 Recall that carbon monoxide is a toxic gas	8.9
2B.8 Describe the problems caused by incomplete combustion, producing carbon monoxide and soot in appliances that use carbon compounds as fuels	8.10
2B.9 Describe how impurities in some hydrocarbon fuels result in the production of sulfur dioxide	8.11
2B.10 Describe some problems associated with acid rain, caused when sulfur dioxide dissolves in rain water	8.12
2B.11 Recall that when fuels are burned in engines, oxygen and nitrogen can react together at high temperatures to produce oxides of nitrogen, which are pollutants	8.13
2B.12 Describe the advantages and disadvantages of using hydrogen, rather than petrol, as a fuel in cars	8.14

Students should:	CS ref
2B.13 Recall that petrol, kerosene and diesel oil are non-renewable fossil fuels obtained from crude oil and methane is a non-renewable fossil fuel found in natural gas	8.15
2B.14 Describe how cracking involves the breaking down of larger hydrocarbon molecules into smaller, more useful ones.	8.16
2B.15 Explain why cracking is necessary	8.17

Earth's atmosphere

Students should:	CS ref
2B.16 Recall that the gases produced by volcanic activity formed the Earth's early atmosphere	8.18
2B.17 Describe that the Earth's early atmosphere was thought to contain: a little or no oxygen b a large amount of carbon dioxide c water vapour d small amounts of other gases and interpret evidence relating to this	8.19
2B.18 Recall how condensation of water vapour formed oceans	8.20
2B.19 Recall how the amount of carbon dioxide in the atmosphere was decreased when carbon dioxide dissolved as the oceans formed	8.21
2B.20 Describe how the amount of oxygen in the early atmosphere gradually increased, as a result of photosynthesis by primitive plants	8.22
2B.21 Describe the chemical test for oxygen	8.23
2B.22 Describe how various gases in the atmosphere, including carbon dioxide, methane and water vapour, absorb heat radiated from the Earth, subsequently releasing energy that keeps the Earth warm: this is known as the greenhouse effect	8.24
2B.23 Describe the potential effects on the climate of increased levels of carbon dioxide and methane generated by human activity, including burning fossil fuels and livestock farming	8.26
2B.24 Evaluate the evidence for and against human activity causing climate change	8.25

Suggested practicals

- Investigate the volume of air used up and products formed when candles are burned.
- Carry out the test for oxygen.

Physics

Paper 5: Physics 2A – Electricity and magnets

Content

Electrical circuits

Students should:		CS ref
2A.1	Interpret diagrams that represent electric circuits, using symbols for: a cells (including batteries) b switches c voltmeters d ammeters e resistors f variable resistors g lamps h LED	10.2
2A.2	Describe the differences between series and parallel circuits	10.3
2A.3	Recall that: a voltmeters are used to measure voltage b voltmeters are always connected in parallel	10.4
2A.4	Recall that: a ammeters are used to measure current b ammeters are always connected in series	10.7
2A.5	Be able to use: charge flowing in a circuit = current × time	10.8
2A.6	Recall that a variable resistor can change the current or voltage in a circuit	10.12
2A.7	Be able to use: voltage = current × resistance	10.13
2A.8	Recognise the voltage-current graphs for the following: a filament lamps b fixed resistors	10.18
2A.9	Describe how the resistance changes in a filament lamp when the voltage increases	10.21
2A.10	Recall that a wire (or resistor) gets hot when there is an electric current through it	10.22

Students should:	CS ref
2A.11 Recall that when there is an electric current in a circuit, some electrical energy is transferred to the surroundings as thermal energy	10.23
2A.12 Be able to use: $\text{power} = \frac{\text{energy transferred}}{\text{time taken}}$	10.29
2A.13 Be able to use: electrical power = current × voltage	10.31
2A.14 Recall that a current that changes direction continuously is called alternating current (a.c.)	10.35
2A.15 Recall that current that moves in only one direction is called direct current (d.c.) and this may come from a cell (battery)	10.34

Suggested practical

- Construct electrical circuits to investigate:
  a) how voltage, current and resistance are related
  b) how the resistance of a filament lamp changes with voltage and current (link to CS 10.17).

Magnets

Students should:	CS ref
2A.16 Recall that: a a magnet has a north pole at one end and a south pole at the other end b unlike poles of two magnets attract c like poles of two magnets repel (push away)	12.1
2A.17 Recall that there are only a few materials that are magnetic: iron, cobalt, nickel, and some alloys (steel)	
2A.18 Describe the shape and direction of the magnetic field around a bar magnet	12.4
2A.19 Recall that a wire which carries a current has a magnetic field around it	12.7
2A.20 Recall that the magnetic field is stronger nearer the wire and when the current is larger	12.8

Electricity in the home

Students should:	CS ref
2A.21 Recall that in the UK the mains electricity supply is a.c. and it has a frequency of 50 hertz and a voltage of 230 V	10.36
2A.22 Describe the three wires in the mains wiring: a live b neutral c earth	10.37, 10.38
2A.23 Describe how: a the earth wire is connected to the outer metal case of an appliance b the earth wire prevents a user from getting a shock c a fuse or circuit breaker prevents the appliance from overheating if the current gets too high	10.38
2A.24 Recall that a fuse and a switch are both placed in the live wire so that they can cut off the current	10.39
2A.25 Recall that a transformer can change the size of an a.c. voltage	13.6
2A.26 Describe how electrical energy is transferred from power stations to towns using the National Grid	13.8
2A.27 Recall that using the National Grid helps to reduce the energy lost during transmission	13.8

Paper 6: Physics 2B – Energy and particles

Content

Work and energy

Students should:		CS ref
2B.1	Describe how energy can be transferred, including: a when forces do work b when electrical equipment is switched on c when an object is heated	8.4
2B.2	Be able to use: work done = force × distance	8.6
2B.3	Recall that when work is done there is always some energy transferred which is not useful	8.11
2B.4	Recall that when a force does some work the object and therefore the surroundings become hotter, due to frictional forces	8.11
2B.5	Be able to use: $\text{power} = \frac{\text{work done}}{\text{time taken}}$	8.13
2B.6	Be able to use: $\text{efficiency} = \left(\frac{\text{useful energy output}}{\text{total energy input}}\right) \times 100\%$	8.15

Suggested practical

- Investigate the work done when lifting an object or when pushing or pulling an object.

Particles

Students should:	CS ref
2B.7 Recall that matter exists in one of three states: solids, liquids or gases	14.1
2B.8 Describe the structure of a solid: a particles are closely packed in a regular arrangement b particles vibrate about a fixed position	14.1
2B.9 Describe the structure of a liquid: a particles are closely packed in a random arrangement b particles can move through the liquid c particles can move over each other	14.1
2B.10 Describe the structure of a gas: a particles are far apart b particles move randomly in all directions	14.1
2B.11 Be able to use: $\text{density} = \frac{\text{mass}}{\text{volume}}$	14.2
2B.12 Recall that generally the density of a solid is greater than that of a liquid and the density of a liquid is greater than that of a gas	14.4
2B.13 Recall that: a a solid melts to form a liquid, which boils to form a gas b a gas condenses to form a liquid, which freezes to form a solid	14.5
2B.14 Recall that the changes of state are reversible and are physical, not chemical, changes	14.5
2B.15 Recall that in order to change state, a material must be heated or cooled	14.6
2B.16 Recall that if you give the same amount of thermal energy to the same mass of different materials, some will get hotter than others	14.7
2B.17 Explain how a gas exerts a pressure on the sides of a container because the particles collide with the sides of a container	14.12
2B.18 Describe how, when a gas is heated: a its particles move faster and hit the walls of the container more often b this increases the pressure of the gas	14.13

Suggested practical

- Investigate the densities of solids (link to CS 14.3).

Stretching

Students should:	CS ref
2B.19 Recall that some materials stretch when a force is applied to them	15.1
2B.20 Recall that the increase in length when a material stretches is called extension	15.3
2B.21 Describe that springs return to their original length when they are stretched and released, and that this is called elastic stretching	15.2
2B.22 Describe that plastic loops do not return to their original length when they are stretched and released, and this is called inelastic stretching	15.2

Suggested practical

- Investigate how the length changes when you add weights to a spring and a plastic loop (such as loop of plastic bag) (link to CS 15.6).

Assessment information

The assessment for each paper is a test out of 25 marks.

Test

- Students must answer all questions.
- The test may include multiple-choice, closed-response, graphical and short-open response questions, and calculations.
- The test will include questions that target mathematics, at the level of Key Stage 3 mathematics.
- The test will include questions that target practical skills.
- Calculators may be used in the test. Information on the use of calculators during the tests for this qualification can be found in *Appendix 2: Calculators*.
- There is no set time for when each test is to be completed or for how long the student takes to complete each test.
- The test can be sat in normal classroom conditions but other examination procedures apply regarding invigilation and safeguards against communication between students.
- Students have the opportunity to retake the tests as many times as they like. However, no feedback or guidance on their original answers should be provided.
- There must be a gap of at least two weeks before they can retake the tests.

Master copies

- Centres will be able to download a clean master copy of each test and mark scheme from the secure area of our website.
- These master copies must be kept confidential and must be kept under secure conditions at all times.
- Teachers will need to download a clean copy of the tests to photocopy and give to the students for them to complete each test.
- The tests and mark schemes will remain valid for the lifetime of the qualification.

Marking and moderation

- The tests are to be marked by the teacher according to the published mark scheme and moderated by Pearson.
- It is recommended that students take as many of the six tests as possible. However, students do not need to take all tests for this qualification. The minimum requirement is for students to complete one test.
- The best marks for each test should be selected and submitted as the final marks. We will then moderate the work.
- The final marks awarded for the tests must be submitted to Pearson on the form in *Appendix 1: Assessment authentication sheet*, by May in the year of certification.
- The student's overall level of achievement will be based on the total marks from the tests submitted to us for moderation.
- The student's total mark out of 150 establishes the level they have achieved. See the *Level of achievement* section on *page 24* for further information.

Assessment Objectives

Students must:		% in Entry Level Certificate
AO1	Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures	45
AO2	Apply knowledge and understanding of scientific ideas, enquiry, techniques and procedures	40
AO3	Analyse, interpret and evaluate evidence, draw conclusions, develop experimental procedures	15
	Total	**100%**

Breakdown of Assessment Objectives

Paper	Assessment Objectives			Total for all Assessment Objectives
	AO1 %	AO2 %	AO3 %	
Paper 1: Biology 2A – Plants and ecosystems	6–9.33	6–7.33	1.33–3.33	16.67%
Paper 2: Biology 2B – Human biology	6–9.33	6–7.33	1.33–3.33	16.67%
Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction	6–9.33	6–7.33	1.33–3.33	16.67%
Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere	6–9.33	6–7.33	1.33–3.33	16.67%
Paper 5: Physics 2A – Electricity and magnets	6–9.33	6–7.33	1.33–3.33	16.67%
Paper 6: Physics 2B – Energy and particles	6–9.33	6–7.33	1.33–3.33	16.67%
Total for Entry Level Certificate	36–56	36–44	8–20	**100%**

NB Totals have been rounded either up or down.

3 Administration and general information

Entries

Details of how to enter students for the examinations for this qualification can be found in our *UK Information Manual*. A copy is made available to all examinations officers and is available on our website: qualifications.pearson.com

Level of achievement

Marks for the externally-set tests are combined to give a maximum total mark of 150.

The student's total mark out of 150 then establishes the level a student has achieved as shown in the table below.

The level of achievement is given below:

Level	Minimum total marks required
Entry Level 1	30/150
Entry Level 2	65/150
Entry Level 3	100/150

The marks awarded for the tests must be submitted to Pearson on the form in *Appendix 1: Assessment record sheet*.

Calculating the overall mark

The marks awarded for up to the total of six externally-set test marks from different topics will be used to determine the level of achievement.

It is recommended that students take as many of the six assessments as possible. However, students do not need to take all assessments for this qualification. The minimum requirement is for the students to complete one assessment.

The student's total mark out of 150 then establishes the level a student has achieved as shown in the table above.

Retaking of assessment

If work submitted by students on any of the externally-set tests is inadequate or incomplete, students may be allowed (at the discretion of the centre) to retake it. However, no feedback or guidance on their original answers should be provided.

There must be a gap of at least two weeks between the original assessment and the retake.

Alternatively, centres can disregard the original assessment and students could be examined on a different topic.

Access arrangements, reasonable adjustments, special consideration and malpractice

Equality and fairness are central to our work. Our equality policy requires all students to have equal opportunity to access our qualifications and assessments, and our qualifications to be awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Language of assessment

Assessment of this qualification will be available in English. All student work must be in English.

Access arrangements

Access arrangements are agreed before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

The intention behind an access arrangement is to meet the particular needs of an individual student with a disability, without affecting the integrity of the assessment.
Access arrangements are the principal way in which awarding bodies comply with the duty under the Equality Act 2010 to make 'reasonable adjustments'.

Access arrangements should always be processed at the start of the course. Students will then know what is available and have the access arrangement(s) in place for assessment.

Reasonable adjustments

The Equality Act 2010 requires an awarding organisation to make reasonable adjustments where a person with a disability would be at a substantial disadvantage in undertaking an assessment. The awarding organisation is required to take reasonable steps to overcome that disadvantage.

A reasonable adjustment for a particular person may be unique to that individual and therefore might not be in the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, including:

- the needs of the student with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the student with the disability and other students.

An adjustment will not be approved if it involves unreasonable costs to the awarding organisation, or affects timeframes or the security or integrity of the assessment. This is because the adjustment is not 'reasonable'.

Special consideration

Special consideration is a post-examination adjustment to a student's mark or grade to reflect temporary injury, illness or other indisposition at the time of the examination/ assessment, which has had, or is reasonably likely to have had, a material effect on a candidate's ability to take an assessment or demonstrate their level of attainment in an assessment.

Further information

Please see our website for further information about how to apply for access arrangements and special consideration.

For further information about access arrangements, reasonable adjustments and special consideration, please refer to the Joint Council for Qualifications (JCQ) website: www.jcq.org.uk.

Malpractice

Candidate malpractice

Candidate malpractice refers to any act by a candidate that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

Candidate malpractice in assessments discovered before the candidate has signed the declaration of authentication form does not need to be reported to Pearson.

Candidate malpractice found in assessments after the declaration of authenticity has been signed, and in examinations **must** be reported to Pearson on a *JCQ Form M1* (available at www.jcq.org.uk/exams-office/malpractice). The completed form can be emailed to pqsmalpractice@pearson.com or posted to: Investigations Team, Pearson, 190 High Holborn, London, WC1V 7BH. Please provide as much information and supporting documentation as possible. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report candidate malpractice constitutes staff or centre malpractice.

Staff/centre malpractice

Staff and centre malpractice includes both deliberate malpractice and maladministration of our qualifications. As with candidate malpractice, staff and centre malpractice is any act that compromises or seeks to compromise the process of assessment or undermines the integrity of the qualifications or the validity of results/certificates.

All cases of suspected staff malpractice and maladministration **must** be reported immediately, before any investigation is undertaken by the centre, to Pearson on a *JCQ Form M2(a)* (available at www.jcq.org.uk/exams-office/malpractice). The form, supporting documentation and as much information as possible can be emailed to pqsmalpractice@pearson.com or posted to: Investigations Team, Pearson, 190 High Holborn, London, WC1V 7BH. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice itself constitutes malpractice.

More detailed guidance on malpractice can be found in the latest version of the document *General and Vocational Qualifications Suspected Malpractice in Examinations and Assessments Policies and Procedures,* available at www.jcq.org.uk/exams-office/malpractice.

Student recruitment and progression

Pearson follows the JCQ policy concerning recruitment to our qualifications in that:

- they must be available to anyone who is capable of reaching the required standard
- they must be free from barriers that restrict access and progression
- equal opportunities exist for all students.

Prior learning and other requirements

There are no prior learning or other requirements for this qualification.

Progression

Students can progress from this qualification to:

- a GCSE in Combined Science
- vocational Level 1 or Level 2 qualifications such as Applied Science.

Appendices

Appendix 1: Assessment authentication sheet

Pearson Edexcel Entry Level Certificate in Further Science (NSF0)		
Centre name:		Centre number:
Candidate name:		Candidate number:
Test		**Mark awarded**
Paper 1: Biology 2A – Plants and ecosystems		**/25**
Paper 2: Biology 2B – Human biology		**/25**
Paper 3: Chemistry 2A – Chemical reactions: patterns, energy and rates of reaction		**/25**
Paper 4: Chemistry 2B – Chemistry in our world: fuels and the Earth's atmosphere		**/25**
Paper 5: Physics 2A – Electricity and magnets		**/25**
Paper 6: Physics 2B – Energy and particles		**/25**
Total marks	**Total for up to the six best tests**	**/150**

Teacher declaration

I declare that the work submitted for assessment has been carried out without assistance other than that which is acceptable according to the rules of the specification.

Teacher name:			
Teacher signed:		Date:	

Candidate declaration

I certify that the work submitted for this assessment is my own. I have clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.

Candidate signed:		Date:	

Appendix 2: Calculators

Students may use a calculator in assessments for this qualification. Centres are responsible for making sure that calculators used by their students meet the requirements highlighted in the table below.

Students must be told these regulations beforehand and they must be familiar with them before their assessments for this qualification.

Students must have a calculator with them for their examinations which they may use.

<table>
<tr>
<td>Calculators must be:
of a size suitable for use on a desk
either battery or solar powered
free of lids, cases and covers that have printed instructions or formulae.</td>
<td rowspan="2">Calculators must not:
be designed or adapted to offer any of these facilities:
language translators
symbolic algebraic manipulation
symbolic differentiation or integration
communication with other machines or the internet
be borrowed from another candidate during an examination for any reason*
have retrievable information stored in them, including:
databanks
dictionaries
mathematical formulae
text.</td>
</tr>
<tr>
<td>The candidate is responsible for:
the calculator’s power supply
the calculator’s working condition
clearing anything stored in the calculator.</td>
</tr>
</table>

*An invigilator may give a student a replacement calculator if needed.

Appendix 3: Working scientifically

Through the content across biology, chemistry and physics, students should be taught so that they develop understanding and experience of:

1 The development of scientific thinking:

a the ways in which scientific methods and theories develop over time

b using a variety of concepts and models to develop scientific explanations and understanding

c appreciating the power and limitations of science and considering ethical issues that may arise

d explaining everyday and technological applications of science

e evaluating risks in practical science

2 Experimental skills and strategies

a using scientific theories and explanations to develop hypotheses

b planning experiments to make observations, test hypotheses or explore phenomena

c applying a knowledge of a range of apparatus to select those appropriate for experiments

d carrying out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations

e making and recording observations and measurements using a range of apparatus and methods

f evaluating methods and suggesting possible improvements and further investigations

3 Analysis and evaluation

Applying the cycle of collecting, presenting and analysing data, including:

a presenting observations and other data using appropriate methods

b translating data from one form to another

c carrying out and representing mathematical and statistical analysis

d representing distributions of results and making estimations of uncertainty

e interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions

f presenting reasoned explanations, including relating data to hypotheses

g being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility

4 Vocabulary, units, symbols and nomenclature

a developing their use of scientific vocabulary and nomenclature

b recognising the importance of scientific quantities and understanding how they are determined

c using SI units and IUPAC chemical nomenclature unless inappropriate

d using prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano)

e interconverting units

f using an appropriate number of significant figures in calculations.

Appendix 4: Taxonomy

The following table lists the command words used in the external assessments.

Command word	Definition
Calculate	Obtain a numerical answer, showing relevant working. If the answer has a unit, this must be included. This can include using an equation to calculate a numerical answer.
Complete	Requires the completion of a table/diagram.
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.
Draw	Produce a neat freehand drawing, paying attention to shape (and scale where appropriate).
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.

Appendix 5: Codes

Type of code	Use of code	Code
Regulated Qualifications Framework (RQF) codes	Each qualification title is allocated an Ofqual Regulated Qualifications Framework (RQF) code. The RQF code is known as a Qualification Number (QN). This is the code that features in the DfE Section 96 and on the LARA as being eligible for 16–18 and 19+ funding, and is to be used for all qualification funding purposes. The QN will appear on students' final certification documentation.	The QN for this qualification is: 603/0993/3
Subject codes	The subject code is used by centres to enter students for a qualification. Centres will need to use the entry codes only when claiming students' qualifications.	Entry Level Further Science – NSF0

Db090217Z:\LT\PD\EDEXCEL ENTRY LEVEL\
9781446943335_ENTRY_LEVEL_FURSCIENCE.DOC.1–40/0

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