Higher
course
specification

Qualifications Scotland
Teisteanasan Alba

Higher Physics, SCQF Level 6 Course Specification

Course code:	C857 76
Course assessment code:	X857 76
SCQF:	level 6 (24 SCQF credit points)
Valid from:	session 2026–27

This document provides detailed information about the course and course assessment to ensure consistent and transparent assessment year on year. It describes the structure of the course and the course assessment in terms of the skills, knowledge and understanding that are assessed.

This document is for teachers and lecturers and contains all the mandatory information you need to deliver the course.

This edition: June 2026 (version 4.0)

Contents

Course overview

The course consists of 24 SCQF credit points which includes time for preparation for course assessment. The notional length of time for candidates to complete the course is 160 hours.

The course assessment has three components.

Component	Marks	Scaled mark	Duration
Question paper Section 1: multiple choice Section 2	20 110	n/a n/a	2 hours and 30 minutes for both sections
Assignment	20	33	8 hours, of which a maximum of 2 hours is allowed for the report stage

Recommended entry	Progression
Entry to this course is at the discretion of the centre. Candidates should have achieved the National 5 Physics course or equivalent qualifications and/or experience prior to starting this course.	♦ Advanced Higher Physics ♦ other qualifications in physics or related areas ♦ further study, employment and/or training

Conditions of award

The grade awarded is based on the total marks achieved across all course assessment components.

Course rationale

National Courses reflect Curriculum for Excellence values, purposes and principles. They offer flexibility, provide time for learning, focus on skills and applying learning, and provide scope for personalisation and choice.

Every course provides opportunities for candidates to develop breadth, challenge and application. The focus and balance of assessment is tailored to each subject area.

Through learning in physics, candidates develop their interest in and understanding of the world. They engage in a wide range of investigative tasks, which allows them to develop important skills to become creative, inventive and enterprising, in a world where the skills and knowledge developed by physics are needed across all sectors of society.

Physics courses should encourage resilience, and give candidates opportunities to think creatively through analysing and solving problems.

The Higher Physics course allows candidates to understand and investigate the world in an engaging and enjoyable way. It develops candidates' ability to think analytically, creatively and independently, and to make reasoned evaluations. The course provides opportunities for candidates to acquire and apply knowledge, to evaluate environmental and scientific issues, to consider risk, and to make informed decisions. This can lead to candidates developing an informed and ethical view of complex issues. Candidates develop skills in communication, collaborative working and leadership, and apply critical thinking in new and unfamiliar contexts to solve problems.

The course uses an experimental and investigative approach to develop knowledge and understanding of concepts in physics.

Due to the interdisciplinary nature of the sciences, candidates may benefit from studying physics along with other subjects from the sciences, technologies and mathematics curriculum areas, as this may enhance their skills, knowledge and understanding.

Purpose and aims

The course develops candidates' interest and enthusiasm for physics in a range of contexts. The skills of scientific inquiry and investigation are developed throughout the course. The relevance of physics is highlighted by the study of the applications of physics in everyday contexts.

The course develops scientific understanding of issues relating to physics. It enables candidates to gain an in-depth knowledge of concepts in physics, and to develop confidence in the skills of scientific inquiry.

Candidates develop their ability to describe and interpret physical phenomena using mathematical skills, and practise scientific methods of investigation from which general relationships are derived and explored.

Candidates gain a deeper insight into the structure of the subject, and reinforce and extend their knowledge and understanding of the concepts of physics.

Advances in physics mean that our view of what is possible is continually being updated. The course allows candidates to deepen their understanding of the processes behind scientific advances, and thus promotes awareness that physics involves interaction between theory and practice.

The course aims to:

- develop and apply knowledge and understanding of physics
- develop an understanding of the role of physics in scientific issues and relevant applications of physics
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills, including scientific evaluation, in a physics context
- develop the skills to use technology, equipment and materials safely, in practical scientific activities
- develop planning skills
- develop problem-solving skills in a physics context
- use and understand scientific literacy to communicate ideas and issues and to make scientifically informed choices
- develop the knowledge and skills for more advanced learning in physics
- develop skills of independent working

Who is this course for?

The course is suitable for candidates who are secure in their attainment of National 5 Physics or an equivalent qualification. It may also be suitable for those wishing to study physics for the first time.

The course emphasises practical and experiential learning opportunities, with a strong skills-based approach to learning. It takes account of the needs of all candidates, and provides sufficient flexibility to enable candidates to achieve in different ways.

Course content

The course content includes the following areas of physics:

Our dynamic Universe

The topics covered are:

- motion — equations and graphs
- forces, energy and power
- collisions, explosions, and impulse
- gravitation
- special relativity
- the expanding Universe

Particles and waves

The topics covered are:

- forces on charged particles
- the Standard Model
- nuclear reactions
- inverse square law
- wave-particle duality
- interference
- spectra
- refraction of light

Electricity

The topics covered are:

- monitoring and measuring AC
- current, potential difference, power, and resistance
- electrical sources and internal resistance
- capacitors
- semiconductors and p-n junctions

Skills, knowledge and understanding

Skills, knowledge and understanding for the course

The following provides a broad overview of the subject skills, knowledge and understanding developed in the course:

- demonstrating knowledge and understanding of physics by making accurate statements
- describing information, providing explanations and integrating knowledge
- applying physics knowledge to new situations, interpreting information and solving problems
- planning and designing experiments/practical investigations to test given hypotheses or to illustrate particular effects
- carrying out experiments/practical investigations safely, recording detailed observations and collecting data
- selecting information from a variety of sources
- presenting information appropriately in a variety of forms
- processing information (using calculations, significant figures and units, where appropriate)
- making predictions from evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- quantifying sources of uncertainty
- evaluating experimental procedures and suggesting improvements
- communicating findings/information effectively

Skills, knowledge and understanding for the course assessment

The following provides details of skills, knowledge and understanding sampled in the course assessment:

Our dynamic Universe

Motion — equations and graphs

Use of appropriate relationships to solve problems involving distance, displacement, speed, velocity, and acceleration for objects moving with constant acceleration in a straight line.

$$d = \bar{v}t$$

$$s = \bar{v}t$$

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

$$s = \frac{1}{2}(u + v)t$$

Interpretation and drawing of motion-time graphs for motion with constant acceleration in a straight line, including graphs for bouncing objects and objects thrown vertically upwards.

Knowledge of the interrelationship of displacement-time, velocity-time and acceleration-time graphs.

Calculation of distance, displacement, speed, velocity, and acceleration from appropriate graphs (graphs restricted to constant acceleration in one dimension, inclusive of change of direction).

Description of an experiment to measure the acceleration of an object down a slope.

Forces, energy, and power

Use of vector addition and appropriate relationships to solve problems involving balanced and unbalanced forces, mass, acceleration and gravitational field strength.

$$F = ma$$

$$W = mg$$

Knowledge of the effects of friction on a moving object (no reference to static and dynamic friction).

Explanation, in terms of forces, of an object moving with terminal velocity.

Interpretation of velocity-time graphs for a falling object when air resistance is taken into account.

Use of Newton's first and second laws to explain the motion of an object.

Our dynamic Universe (continued)

Forces, energy, and power (continued)

Use of free body diagrams and appropriate relationships to solve problems involving friction and tension.

$F = ma$

$W = mg$

Resolution of a vector into two perpendicular components.

Resolution of the weight of an object on a slope into component forces parallel and normal to the surface of the slope.

Use of the principle of conservation of energy and appropriate relationships to solve problems involving work done, potential energy, kinetic energy, and power.

$E_w = Fd$, or $W = Fd$

$E_P = mgh$

$E_k = \frac{1}{2}mv^2$

$P = \frac{E}{t}$

Collisions, explosions, and impulse

Use of the principle of conservation of momentum and an appropriate relationship to solve problems involving the momentum, mass and velocity of objects interacting in one dimension.

$p = mv$

Knowledge of energy interactions involving the total kinetic energy of systems of objects undergoing inelastic collisions, elastic collisions and explosions.

Use of an appropriate relationship to solve problems involving the total kinetic energy of systems of interacting objects.

$E_k = \frac{1}{2}mv^2$

Use of Newton's third law to explain the motion of objects involved in interactions.

Interpretation of force-time graphs involving interacting objects.

Knowledge that the impulse of a force is equal to the area under a force-time graph and is equal to the change in momentum of an object involved in the interaction.

Use of data from a force-time graph to solve problems involving the impulse of a force, the average force and its duration.

Our dynamic Universe (continued)

Collisions, explosions, and impulse (continued)

Use of an appropriate relationship to solve problems involving mass, change in velocity, average force, and duration of the force for an object involved in an interaction.

$$Ft = mv - mu$$

Gravitation

Description of an experiment to measure the acceleration of a falling object.

Knowledge that the horizontal motion and the vertical motion of a projectile are independent of each other.

Knowledge that satellites are in free fall around a planet/star.

Resolution of the initial velocity of a projectile into horizontal and vertical components, and their use in calculations.

Use of resolution of vectors, vector addition, and appropriate relationships to solve problems involving projectiles.

$$d = \overline{v}t$$

$$s = \overline{v}t$$

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

$$s = \frac{1}{2}(u + v)t$$

Use of Newton's Law of Universal Gravitation to solve problems involving force, masses and their separation.

$$F = G\frac{m_1 m_2}{r^2}$$

Special relativity

Knowledge that the speed of light in a vacuum is the same for all observers.

Knowledge that measurements of space, time and distance for a moving observer are changed relative to those for a stationary observer, giving rise to time dilation and length contraction.

Our dynamic Universe (continued)

Special relativity (continued)

Use of appropriate relationships to solve problems involving time dilation, length contraction, and speed.

$$t' = \frac{t}{\sqrt{1-\left(\frac{v}{c}\right)^2}}$$

$$l' = l\sqrt{1-\left(\frac{v}{c}\right)^2}$$

The expanding Universe

Knowledge that the Doppler effect causes shifts in wavelengths of sound and light.

Use of an appropriate relationship to solve problems involving the observed frequency, source frequency, source speed and wave speed.

$$f_o = f_s\left(\frac{v}{v \pm v_s}\right)$$

Knowledge that the light from objects moving away from us is shifted to longer wavelengths (redshift).

Knowledge that the redshift of a galaxy is the change in wavelength divided by the emitted wavelength. For slowly moving galaxies, redshift is the ratio of the recessional velocity of the galaxy to the velocity of light.

Use of appropriate relationships to solve problems involving redshift, observed wavelength, emitted wavelength and recessional velocity.

$$z = \frac{\lambda_{observed} - \lambda_{rest}}{\lambda_{rest}}$$

$$z = \frac{v}{c}$$

Use of an appropriate relationship to solve problems involving the Hubble constant, the recessional velocity of a galaxy and its distance from us.

$$v = H_o d$$

Knowledge that the Hubble-Lemaître Law allows us to estimate the age of the Universe.

Knowledge that measurements of the velocities of galaxies and their distance from us lead to the theory of the expanding Universe.

Knowledge that the mass of a galaxy can be estimated by the orbital speed of stars within it.

Our dynamic Universe (continued)

The expanding Universe (continued)

Knowledge that evidence supporting the existence of dark matter comes from estimations of the mass of galaxies.

Knowledge that evidence supporting the existence of dark energy comes from the accelerating rate of expansion of the Universe.

Knowledge that the temperature of stellar objects is related to the distribution of emitted radiation over a wide range of wavelengths.

Knowledge that the peak wavelength of this distribution is shorter for hotter objects than for cooler objects.

Knowledge that hotter objects emit more radiation per unit surface area per unit time than cooler objects.

Knowledge of evidence supporting the Big Bang theory and subsequent expansion of the Universe: cosmic microwave background radiation, the abundance of the elements hydrogen and helium, the darkness of the sky (Olbers' paradox) and the large number of galaxies showing redshift rather than blueshift.

Particles and waves

Forces on charged particles

Knowledge that charged particles experience a force in an electric field.

Knowledge that electric fields exist around charged particles and between charged parallel plates.

Sketch electric field patterns for single-point charges, systems of two-point charges and between two charged parallel plates (ignore end effects).

Determination of the direction of movement of charged particles in an electric field.

Definition of voltage (potential difference) in terms of work done and charge.

Use of appropriate relationships to solve problems involving the charge, mass, speed and energy of a charged particle in an electric field, and the potential difference through which it moves.

$$W = QV$$

$$E_k = \tfrac{1}{2}mv^2$$

Knowledge that a moving charge produces a magnetic field.

Determination of the direction of the force on a charged particle moving in a magnetic field for negative and positive charges.

Particles and waves (continued)

Forces on charged particles (continued)

Knowledge of the basic operation of particle accelerators in terms of acceleration by electric fields, deflection by magnetic fields and high-energy collisions of charged particles to produce other particles.

The Standard Model

Knowledge that the Standard Model is a model of fundamental particles and interactions.

Use of orders of magnitude and awareness of the range of orders of magnitude of length from the very small (sub-nuclear) to the very large (distance to furthest known celestial objects).

Knowledge that evidence for the existence of quarks comes from high-energy collisions between electrons and nucleons, carried out in particle accelerators.

Knowledge that in the Standard Model, every particle has an antiparticle and that the production of energy in the annihilation of particles is evidence for the existence of antimatter.

Description of beta decay as the first evidence for the neutrino.

$${}^{1}_{0}\mathrm{n} \rightarrow {}^{1}_{1}\mathrm{p} + {}^{0}_{-1}\mathrm{e} + \bar{\nu}_{\mathrm{e}}$$

(β+ decay not required)

Knowledge that fermions, the matter particles, consist of quarks (six types: up, down, strange, charm, top, bottom) and leptons (electron, muon and tau, together with their neutrinos).

Knowledge that hadrons are composite particles made of quarks.

Knowledge that baryons are made of three quarks.

Knowledge that mesons are made of quark-antiquark pairs.

Knowledge that the force-mediating particles are bosons: photons (electromagnetic force), W- and Z-bosons (weak force) and gluons (strong force).

Nuclear reactions

Use of nuclear equations to describe radioactive decay, fission (spontaneous and induced) and fusion reactions, with reference to mass and energy equivalence.

Use of an appropriate relationship to solve problems involving the mass loss and the energy released by a nuclear reaction.

$$E = mc^2$$

Knowledge that nuclear fusion reactors require charged particles at a very high temperature (plasma) which have to be contained by magnetic fields.

Particles and waves (continued)

Inverse square law

Knowledge that irradiance is the power per unit area incident on a surface.

Use of an appropriate relationship to solve problems involving irradiance, the power of radiation incident on a surface and the area of the surface.

$$I = \frac{P}{A}$$

Knowledge that irradiance is inversely proportional to the square of the distance from a point source.

Description of an experiment to verify the inverse square law for a point source of light.

Use of an appropriate relationship to solve problems involving irradiance and distance from a point source of light.

$$I = \frac{k}{d^2}$$

$$I_1 d_1^2 = I_2 d_2^2$$

Wave-particle duality

Knowledge that the photoelectric effect is evidence for the particle model of light.

Knowledge that photons of sufficient energy can eject electrons from the surface of materials (photoemission).

Use of an appropriate relationship to solve problems involving the frequency and energy of a photon.

$$E = hf$$

Knowledge that the threshold frequency is the minimum frequency of a photon required for photoemission.

Knowledge that the work function of a material is the minimum energy of a photon required to cause photoemission.

Use of appropriate relationships to solve problems involving the mass, maximum kinetic energy and speed of photoelectrons, the threshold frequency of the material, and the frequency and wavelength of the photons.

$$E_k = hf - hf_0$$

$$E_k = \tfrac{1}{2} mv^2$$

$$v = f\lambda$$

Particles and waves (continued)

Interference

Knowledge that interference is evidence for the wave model of light.

Knowledge that coherent waves have a constant phase relationship.

Description of the conditions for constructive and destructive interference in terms of the phase difference between two waves.

Knowledge that maxima and minima are produced when the path difference between waves is a whole number of wavelengths or an odd number of half-wavelengths respectively.

Use of an appropriate relationship to solve problems involving the path difference between waves, wavelength and order number.

$$\text{path difference} = m\lambda \text{ or } \left(m + \tfrac{1}{2}\right)\lambda \text{ where } m = 0, 1, 2...$$

Use of an appropriate relationship to solve problems involving grating spacing, wavelength, order number and angle to the maximum.

$$d \sin\theta = m\lambda$$

Spectra

Knowledge of the Bohr model of the atom.

Knowledge of the terms ‘ground state’, ‘energy levels’, ‘ionisation’ and ‘zero potential energy’ in relation to the Bohr model of the atom.

Knowledge of the mechanism of production of line emission spectra, continuous emission spectra, and absorption spectra in terms of electron energy level transitions.

Use of appropriate relationships to solve problems involving energy levels and the frequency of the radiation emitted/absorbed.

$$E_2 - E_1 = hf$$
$$E = hf$$

Knowledge that the absorption lines (Fraunhofer lines) in the spectrum of sunlight provide evidence for the composition of the Sun’s outer atmosphere.

Particles and waves (continued)

Refraction of light

Definition of absolute refractive index of a medium as the ratio of the speed of light in a vacuum to the speed of light in the medium.

Use of an appropriate relationship to solve problems involving absolute refractive index, the angle of incidence and the angle of refraction.

$$n = \frac{\sin\theta_1}{\sin\theta_2}$$

Description of an experiment to determine the refractive index of a medium.

Use of appropriate relationships to solve problems involving the angles of incidence and refraction, the wavelength of light in each medium, the speed of light in each medium, and the frequency, including situations where light is travelling from a more dense to a less dense medium.

$$\frac{\sin\theta_1}{\sin\theta_2} = \frac{\lambda_1}{\lambda_2} = \frac{v_1}{v_2}$$

$$v = f\lambda$$

Knowledge that the refractive index of a medium increases as the frequency of incident radiation increases.

Definition of critical angle as the angle of incidence that produces an angle of refraction of 90°.

Knowledge that total internal reflection occurs when the angle of incidence is greater than the critical angle.

Use of an appropriate relationship to solve problems involving critical angle and absolute refractive index.

$$\sin\theta_c = \frac{1}{n}$$

Electricity

Monitoring and measuring AC

Knowledge that AC is a current that changes direction and instantaneous value with time.

Use of appropriate relationships to solve problems involving root mean square (rms) and peak values.

$$V_{rms} = \frac{V_{peak}}{\sqrt{2}}$$

$$I_{rms} = \frac{I_{peak}}{\sqrt{2}}$$

Determination of frequency, peak and rms values from graphical data.

$$T = \frac{1}{f}$$

Current, potential difference, power, and resistance

Use of appropriate relationships to solve problems involving potential difference, current, power and resistance. Solutions may involve several steps.

$$V = IR$$

$$P = IV = I^2 R = \frac{V^2}{R}$$

$$R_T = R_1 + R_2 + \ldots$$

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$$

Use of appropriate relationships to solve problems involving potential divider circuits.

$$V_1 = \left(\frac{R_1}{R_1 + R_2}\right) V_S$$

$$\frac{V_1}{V_2} = \frac{R_1}{R_2}$$

Electrical sources and internal resistance

Knowledge of the terms ‘electromotive force’ (EMF), ‘internal resistance’, ‘lost volts’, ‘terminal potential difference’ (t.p.d.), ‘ideal supplies’, ‘short circuit’ and ‘open circuit’.

Use of appropriate relationships to solve problems involving EMF, lost volts, t.p.d., current, external resistance and internal resistance.

$$E = V + Ir$$

$$V = IR$$

Description of an experiment to measure the EMF and internal resistance of a cell.

Determination of EMF, internal resistance, and short circuit current using graphical analysis.

Electricity (continued)

Capacitors

Knowledge that a capacitor of 1 farad will store 1 coulomb of charge when the potential difference across it is 1 volt.

Use of an appropriate relationship to solve problems involving capacitance, charge and potential difference.

$$C = \frac{Q}{V}$$

Use of an appropriate relationship to determine the charge stored on a capacitor for a constant charging current.

$$Q = It$$

Knowledge that the total energy stored in a charged capacitor is equal to the area under a charge-potential difference graph.

Use of appropriate relationships to solve problems involving energy, charge, capacitance and potential difference.

$$E = \tfrac{1}{2}QV = \tfrac{1}{2}CV^2 = \tfrac{1}{2}\frac{Q^2}{C}$$

Knowledge of the variation of current and potential difference with time for both charging and discharging cycles of a capacitor in an RC circuit (charging and discharging curves).

Knowledge of the effect of resistance and capacitance on charging and discharging curves in an RC circuit.

Description of experiments to investigate the variation of current in a capacitor and voltage across a capacitor with time, for the charging and discharging of capacitors.

Semiconductors and p-n junctions

Knowledge of the terms 'conduction band' and 'valence band'.

Knowledge that solids can be categorised into conductors, semiconductors or insulators by their band structure and their ability to conduct electricity. Every solid has its own characteristic energy band structure. For a solid to be conductive, both free electrons and accessible empty states must be available.

Qualitative explanation of the electrical properties of conductors, insulators and semiconductors using the electron population of the conduction and valence bands and the energy difference between the conduction and valence bands. (Reference to Fermi levels is not required.)

The electrons in atoms are contained in energy levels. When the atoms come together to form solids, the electrons then become contained in energy bands separated by gaps.

Electricity (continued)

Semiconductors and p-n junctions (continued)

For metals we have the situation where one or more bands are partially filled.

Some metals have free electrons and partially filled valence bands, therefore they are highly conductive.

Some metals have overlapping valence and conduction bands. Each band is partially filled and therefore they are conductive.

In an insulator, the highest occupied band (called the valence band) is full. The first unfilled band above the valence band is the conduction band. For an insulator, the gap between the valence band and the conduction band is large and at room temperature there is not enough energy available to move electrons from the valence band into the conduction band where they would be able to contribute to conduction. There is no electrical conduction in an insulator.

In a semiconductor, the gap between the valence band and conduction band is smaller and at room temperature there is sufficient energy available to move some electrons from the valence band into the conduction band allowing some conduction to take place. An increase in temperature increases the conductivity of a semiconductor.

Knowledge that, during manufacture, semiconductors may be doped with specific impurities to increase their conductivity, resulting in two types of semiconductor: p-type and n-type.

Knowledge that, when a semiconductor contains the two types of doping (p-type and n-type) in adjacent layers, a p-n junction is formed. There is an electric field in the p-n junction. The electrical properties of this p-n junction are used in a number of devices.

Knowledge of the terms 'forward bias' and 'reverse bias'. Forward bias reduces the electric field; reverse bias increases the electric field in the p-n junction.

Knowledge that LEDs are forward biased p-n junction diodes that emit photons. The forward bias potential difference across the junction causes electrons to move from the conduction band of the n-type semiconductor towards the conduction band of the p-type semiconductor.

Photons are emitted when electrons 'fall' from the conduction band into the valence band either side of the junction.

Knowledge that solar cells are p-n junctions designed so that a potential difference is produced when photons are absorbed. (This is known as the photovoltaic effect.) The absorption of photons provides energy to 'raise' electrons from the valence band of the semiconductor to the conduction band. The p-n junction causes the electrons in the conduction band to move towards the n-type semiconductor and a potential difference is produced across the solar cell.

Units, prefixes and uncertainties

Units, prefixes and scientific notation

Appropriate use of units and prefixes.

SI units should be used with all physical quantities, where appropriate. Prefixes should be used where appropriate. These include pico (p), nano (n), micro (μ), milli (m), kilo (k), mega (M), giga (G) and tera (T).

Use of the appropriate number of significant figures in final answers. This means that the final answer can have no more significant figures than the value with fewest number of significant figures used in the calculation.

Appropriate use of scientific notation.

Uncertainties

Knowledge of scale reading, random and systematic uncertainties in a measured quantity.

All measurements of physical quantities are liable to uncertainty, which should be expressed in absolute or percentage form.

Scale reading uncertainty is an indication of how precisely an instrument scale can be read.

Random uncertainties arise when measurements are repeated and slight variations occur. Random uncertainties may be reduced by increasing the number of repeated measurements.

Use of an appropriate relationship to determine the approximate random uncertainty in a value using repeated measurements.

$$random\ uncertainty = \frac{max.\ value\ \text{-}\ min.\ value}{number\ of\ \ values}$$

or

$$\Delta R = \frac{R_{\max} - R_{\min}}{n}$$

Systematic uncertainties occur when readings taken are either all too small or all too large. This can arise due to measurement techniques or experimental design.

The mean of a set of repeated measurements is the best estimate of the ‘true’ value of the quantity being measured. When systematic uncertainties are present, the mean value will be offset. When mean values are used, the approximate random uncertainty should be calculated.

Appropriate use of uncertainties in data analysis.

When an experiment is being undertaken and more than one physical quantity is measured, the quantity with the largest percentage uncertainty should be identified and this may often be used as a good estimate of the percentage uncertainty in the final numerical result of an experiment. The numerical result of an experiment should be expressed in the form *final value* ± *uncertainty*.

Skills, knowledge and understanding included in the course are appropriate to the SCQF level of the course. The SCQF level descriptors give further information on characteristics and expected performance at each SCQF level, and can be found on the SCQF website.

Skills for learning, skills for life and skills for work

This course helps candidates to develop broad, generic skills. These skills are based on SQA's Skills Framework: Skills for Learning, Skills for Life and Skills for Work and draw from the following main skills areas:

1 Literacy

1.2 Writing

2 Numeracy

2.1 Number processes
2.2 Money, time and measurement
2.3 Information handling

5 Thinking skills

5.3 Applying
5.4 Analysing and evaluating
5.5 Creating

Teachers and/or lecturers must build these skills into the course at an appropriate level, where there are suitable opportunities.

Learning for Sustainability

Qualifications Scotland is committed to identifying opportunities to develop the values, skills, knowledge and understanding of Learning for Sustainability within all National Courses.

Course assessment

Course assessment is based on the information provided in this document.

The course assessment meets the key purposes and aims of the course by addressing:

- breadth — drawing on knowledge and skills from across the course
- challenge — requiring greater depth or extension of knowledge and/or skills
- application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This enables candidates to apply:

- breadth and depth of skills, knowledge and understanding from across the course to answer questions in physics
- skills of scientific inquiry, using related knowledge, to carry out a meaningful and appropriately challenging investigation in physics and communicate findings

The course assessment has three components: a two-section question paper and an assignment. The relationship between these three components is complementary, to ensure appropriate coverage of the knowledge and skills of the course.

Course assessment structure: question paper

Section 1: multiple choice — 20 marks

Section 2: — 110 marks

The question paper has a total allocation of 130 marks. This contributes 80% to the overall marks for the course assessment.

Both sections of the question paper assess breadth, challenge, and application of skills, and knowledge and understanding from across the course. The question paper also assesses scientific inquiry skills and analytical thinking skills.

Section 1 contains multiple-choice questions and has 20 marks.

Section 2 contains restricted-response and extended-response questions and has 110 marks.

A data sheet and a relationships sheet are provided.

The majority of the marks are awarded for applying knowledge and understanding. The other marks are awarded for applying scientific inquiry, scientific analytical thinking and problem-solving skills.

The question paper gives candidates an opportunity to demonstrate the following skills, knowledge and understanding:

- making accurate statements
- providing descriptions and explanations and integrating knowledge
- applying knowledge of physics to new situations, interpreting information and solving problems
- planning or designing experiments/practical investigations to test given hypotheses or to illustrate particular effects, including safety measures
- selecting information from a variety of sources
- presenting information appropriately in a variety of forms
- processing information (using calculations, significant figures and units, where appropriate)
- making predictions from evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- evaluating experimental procedures, identifying sources of uncertainty and suggesting improvements, where appropriate

Setting, conducting and marking the question paper

The question paper is set and marked by Qualifications Scotland, and conducted in centres under conditions specified for external examinations by Qualifications Scotland.

Candidates have 2 hours and 30 minutes to complete both sections of the question paper.

A specimen question paper for the Higher course is published on Qualifications Scotland's website. This illustrates the standard, structure and requirements of the question paper candidates sit. The specimen paper also includes marking instructions.

Course assessment structure: assignment

Assignment 20 marks

The assignment has a total allocation of 20 marks. This is scaled to 33 marks by Qualifications Scotland. This contributes 20% to the overall marks for the course assessment.

The assignment assesses the application of skills of scientific inquiry and related physics knowledge and understanding.

It allows assessment of skills that cannot be assessed through the question paper, for example the handling and processing of data gathered from experimental work by the candidate.

Assignment overview

The assignment gives candidates an opportunity to demonstrate the following skills, knowledge and understanding:

- applying physics knowledge to new situations, interpreting information and solving problems
- planning and designing experiments/practical investigations to test given hypotheses or to illustrate particular effects
- recording detailed observations and collecting data from experiments/practical investigations
- selecting information from a variety of sources
- presenting information appropriately in a variety of forms
- processing information (using calculations, significant figures and units, where appropriate)
- drawing valid conclusions and giving explanations supported by evidence/justification
- quantifying sources of uncertainty
- evaluating experimental procedures and suggesting improvements
- communicating findings/information effectively

The assignment offers challenge by requiring candidates to apply skills, knowledge and understanding in a context that is one or more of the following:

- unfamiliar
- familiar but investigated in greater depth
- integrating a number of familiar contexts

Candidates research and report on a topic that allows them to apply skills and knowledge in physics at a level appropriate to Higher.

The topic must be chosen with guidance from teachers and/or lecturers and must involve experimental work.

The assignment has two stages:

- research
- report

The research stage **must** involve experimental work that allows measurements to be made. Candidates must also gather data/information from the internet, books or journals.

Candidates must produce a report on their research.

Setting, conducting and marking the assignment

Setting

The assignment is:

- set by centres within Qualifications Scotland guidelines
- set at a time appropriate to the candidate's needs
- set within teaching and learning and includes experimental work at a level appropriate to Higher

Conducting

The assignment is:

- an individually produced piece of work from each candidate
- started at an appropriate point in the course
- conducted under controlled conditions

Marking

The assignment has a total of 20 marks. The table gives details of the mark allocation for each section of the report.

Section	Expected response	Marks
Aim	An aim that describes clearly the purpose of the investigation.	1
Underlying physics	An account of the physics relevant to the aim of the investigation.	3
Data collection and handling	A brief summary of an approach used to collect experimental data.	1
	Sufficient raw data from the candidate's experiment.	1
	Data, including any mean and/or derived values, presented in correctly produced table.	1
	Data relevant to the experiment obtained from an internet/literature source **or** data relevant to the aim of the investigation obtained from a second experiment.	1
	A citation and reference for a source of internet/literature data or information.	1
Graphical presentation	Axes of the graph have suitable scales.	1
	Axes of the graph have suitable labels and units.	1
	Accurately plotted data points and, where appropriate, a line of best fit.	1
Uncertainties	Scale reading uncertainties and random uncertainties.	2
Analysis	Analysis of experimental data.	1
Conclusion	A valid conclusion that relates to the aim and is supported by all the data in the report.	1
Evaluation	Evaluation of the investigation.	3
Structure	A clear and concise report with an informative title.	1
TOTAL		**20**

The report is submitted to Qualifications Scotland for external marking.

All marking is quality assured by Qualifications Scotland.

Assessment conditions

Controlled assessment is designed to:

- ensure that all candidates spend approximately the same amount of time on their assignments
- prevent third parties from providing inappropriate levels of guidance and input
- mitigate concerns about plagiarism and improve the reliability and validity of Qualifications Scotland awards
- allow centres a reasonable degree of freedom and control
- allow candidates to produce an original piece of work

Detailed conditions for assessment are given in the assignment assessment task.

Time

It is recommended that no more than 8 hours is spent on the **whole** assignment. A maximum of 2 hours is allowed for the report stage.

Supervision, control and authentication

There are two levels of control.

Under a high degree of supervision and control	Under some supervision and control
♦ the use of resources is tightly prescribed ♦ all candidates are within direct sight of the supervisor throughout the session(s) ♦ display materials which might provide assistance are removed or covered ♦ there is no access to e-mail, the internet or mobile phones ♦ candidates complete their work independently ♦ interaction with other candidates does not occur ♦ no assistance of any description is provided	♦ candidates do not need to be directly supervised at all times ♦ the use of resources, including the internet, is not tightly prescribed ♦ the work an individual candidate submits for assessment is their own ♦ teachers and/or lecturers can provide reasonable assistance

The assignment has two stages.

Stage	Level of control
♦ research	conducted under some supervision and control
♦ report	conducted under a high degree of supervision and control

Resources

Please refer to the instructions for teachers and lecturers within the assignment assessment task.

It is not permitted at any stage to provide candidates with a template or model answers.

In the research stage:

- teachers and/or lecturers must ensure that a range of topics is available for candidates to choose from
- teachers and/or lecturers must minimise the number of candidates investigating the same topic within a class
- teachers and/or lecturers must agree the choice of topic with the candidate
- teachers and/or lecturers must provide advice on the suitability of the candidate's aim
- teachers and/or lecturers can supply a basic list of instructions for the experimental procedure(s)
- candidates must undertake research using **only** websites, journals and/or books
- a wide list of URLs and/or a wide range of books and journals may be provided

Teachers and/or lecturers **must not**:

- provide an aim
- provide candidates with a set of experimental data
- provide candidates with a blank or pre-populated table for experimental results
- provide candidates with feedback on their research

The only materials that **can** be used in the report stage are:

- the instructions for candidates, which must not have been altered
- the experimental method(s), if appropriate
- the candidate's raw experimental data which may be tabulated; the table must not have additional blank or pre-populated columns for mean and derived values
- numerical and/or graphical data from the internet/literature which must not include sample calculations
- extract(s) from the internet/literature sources to support the description of the underlying physics which must not include sample calculations
- a record of the source(s) of data or extract(s) from the internet/literature

Candidates **must not** have access to a previously prepared draft of a report or any part of a report.

In addition, candidates **must not** have access to the assignment marking instructions during the report stage.

Candidates **must not** have access to the internet during the report stage.

Teachers and/or lecturers must not provide any form of feedback to a candidate on their report.

Following completion of the report stage candidates must not be given the opportunity to redraft their report.

Teachers and/or lecturers must not read the reports before they are submitted to Qualifications Scotland.

Reasonable assistance

The term ‘reasonable assistance’ is used to describe the balance between supporting candidates and giving them too much assistance. Candidates must undertake the assessment independently. However, reasonable assistance may be provided before the formal assessment process (research stage and report stage) takes place. If candidates have been entered for the correct level of qualification, they will not require more than a reasonable level of assistance to carry out the assignment.

Evidence to be gathered

The following candidate evidence is required for this assessment:

- a report

The report is submitted to Qualifications Scotland, within a given timeframe, for marking.

The same report cannot be submitted for more than one subject.

Volume

There is no word count.

Grading

Candidates’ overall grades are determined by their performance across the course assessment. The course assessment is graded A–D on the basis of the total mark for all course assessment components.

Grade description for C

For the award of grade C, candidates will typically have demonstrated successful performance in relation to the skills, knowledge and understanding for the course.

Grade description for A

For the award of grade A, candidates will typically have demonstrated a consistently high level of performance in relation to the skills, knowledge and understanding for the course.

Equality and inclusion

This course is designed to be as fair and as accessible as possible.

Qualifications Scotland's equality of access to qualifications policy outlines our commitment to:

- the Equality Act 2010
- anti-racist education
- protecting children's rights
- corporate parenting

Teachers and lecturers must consider the needs of individual candidates when planning learning experiences, designing learning resources, or choosing texts.

Guidance on assessment arrangements for disabled candidates and those with additional support needs is available on the assessment arrangements web page.

Further information

The following reference documents provide useful information and background.

- Higher Physics subject page
- Assessment arrangements
- Building the Curriculum 3–5
- Guidance on conditions of assessment for coursework
- Guide to Assessment
- Recent Qualifications Scotland research
- Remote assessment
- SCQF Handbook
- Know Your SCQF Level — Scottish Credit and Qualifications Framework
- Skills for Learning, Skills for Life and Skills for Work framework

The SCQF framework, level descriptors and handbook are available on the SCQF website.

Appendix: course support notes

Introduction

These support notes are not mandatory. They provide advice and guidance to teachers and lecturers on approaches to delivering the course. Teachers and lecturers should read these in conjunction with this course specification and the specimen question paper and the assignment assessment task.

Developing skills, knowledge and understanding

This section provides further advice and guidance about skills, knowledge and understanding that could be included in the course. Teachers and lecturers have considerable flexibility to select contexts that stimulate and challenge candidates, offering both breadth and depth. Flexibility and differentiation of tasks should be built into the course to allow candidates of differing abilities to demonstrate achievement.

Learning and teaching should build on candidates' prior knowledge, skills and understanding. Candidates should be given opportunities to take responsibility for their learning.

An investigative approach is encouraged in physics, with candidates actively involved in developing their skills, knowledge and understanding. A holistic approach, involving a wide range of experimental work, should be adopted to encourage the simultaneous development of candidates' conceptual understanding and skills, rather than practical work being treated as a standalone activity.

Candidates should spend a significant proportion of the guided-learning hours for the course carrying out practical work, and developing the skills and knowledge with practical work.

Where appropriate, investigative work/experiments in physics should allow candidates the opportunity to select activities and/or carry out extended study. Investigative and experimental work is part of the scientific methods of working and fulfils a number of educational purposes.

Learning and teaching should offer opportunities for candidates to work collaboratively. Practical activities and investigative work can offer opportunities for group work, which centres should encourage. Group work approaches can be used to simulate real-life situations, share tasks and promote team-working skills.

Laboratory work should include the use of technology and equipment to reflect current practices in physics. Teachers and lecturers are responsible for ensuring that appropriate risk assessment has been undertaken.

In addition to guided-learning hours, candidates are expected to contribute their own time.

Effective partnership working can enhance the learning experience. Guest speakers from industry, further and higher education could be invited to share their knowledge of particular aspects of physics.

Technology makes a significant contribution to the Physics course. In addition to using computers as a learning tool, computer animations and simulations may help develop candidates' understanding of physics principles and processes. Computer interfacing equipment can detect changes in variables, allowing experimental results to be recorded and processed. Results can also be displayed in real time, which helps to improve understanding.

Approaches to learning and teaching

Assessment should be integral to and improve learning and teaching. The approach should involve candidates and provide supportive feedback. Candidates can benefit from self- and peer-assessment techniques, wherever appropriate. Assessment information can be used to set learning targets and next steps.

Teaching should involve a range of approaches to develop knowledge and understanding, and skills for learning, life and work. The mandatory content **can be taught in any order** and may be integrated into a sequence of activities, centred on an idea, theme or application of physics or based on a variety of discrete contexts.

Examples of possible learning and teaching activities can be found in the table overleaf. The first column matches the 'skills, knowledge and understanding for the course assessment' section in this course specification. The second column offers suggestions for activities that could be used to enhance teaching and learning.

All resources named were correct at the time of publication and may be subject to change. Learning should be experiential, active, challenging and enjoyable and must include a wide range of appropriate practical experiments/activities.

Our dynamic Universe Mandatory content	Suggested activities
Motion — equations and graphs	
Use of appropriate relationships to solve problems involving distance, displacement, speed, velocity, and acceleration for objects moving with constant acceleration in a straight line. $d = \bar{v}t$ $s = \bar{v}t$ $v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$ $s = \frac{1}{2}(u + v)t$	Undertake experiments to verify the relationships shown. Use light gates or motion sensors and software/hardware to measure displacement, velocity and acceleration. Use software to analyse videos of motion.
Interpretation and drawing of motion-time graphs for motion with constant acceleration in a straight line, including graphs for bouncing objects and objects thrown vertically upwards. Knowledge of the interrelationship of displacement-time, velocity-time and acceleration-time graphs. Calculation of distance, displacement, speed, velocity, and acceleration from appropriate graphs (graphs restricted to constant acceleration in one dimension, inclusive of change of direction). Description of an experiment to measure the acceleration of an object down a slope.	Use motion sensors to enable graphical representation of motion. Analyse displacement-time graphs. Gradient is velocity. Analyse velocity-time graphs. Area under graph is change in displacement during the selected time interval. Gradient is acceleration. Analyse acceleration-time graphs. Area under graph is change in velocity during the selected time interval. Analyse the motion of athletes and of equipment used in sports. Investigate the initial acceleration of an object projected vertically upwards (for example popper toy). Investigate the variation of acceleration on a slope with the sine of the angle of the slope.

Our dynamic Universe Mandatory content	Suggested activities
Forces, energy, and power	
Use of vector addition and appropriate relationships to solve problems involving balanced and unbalanced forces, mass, acceleration and gravitational field strength. $F = ma$ $W = mg$ Knowledge of the effects of friction on a moving object (no reference to static and dynamic friction). Explanation, in terms of forces, of an object moving with terminal velocity. Interpretation of velocity-time graphs for a falling object when air resistance is taken into account. Use of Newton's first and second laws to explain the motion of an object. Use of free body diagrams and appropriate relationships to solve problems involving friction and tension. $F = ma$ $W = mg$ Resolution of a vector into two perpendicular components.	Analyse forces acting in one or two dimensions. Analyse forces in rocket motion, jet engines, pile driving, scuba diving, lifts, haulage systems and sport. Analyse forces involved in space flight. Analyse forces involved in skydiving and parachuting and falling raindrops. Investigate the effect of the cross-sectional area of a falling object on its terminal velocity. Analyse the motion of a rocket involving a constant force on changing mass as fuel is used up. Analyse situations when forces are exerted by strings, cables, couplings, or by objects in contact.

Our dynamic Universe Mandatory content	Suggested activities
Forces, energy, and power (continued)	
Resolution of the weight of an object on a slope into component forces parallel and normal to the surface of the slope.	Investigate the variation of the force parallel to slope with the sine of the angle of the slope.
Use of the principle of conservation of energy and appropriate relationships to solve problems involving work done, potential energy, kinetic energy, and power. $E_w = Fd$, or $W = Fd$ $E_P = mgh$ $E_k = \frac{1}{2}mv^2$ $P = \frac{E}{t}$	Determine frictional forces acting on a trolley rolling down a slope, by the difference between potential and kinetic energy.
Collisions, explosions, and impulse	
Use of the principle of conservation of momentum and an appropriate relationship to solve problems involving the momentum, mass and velocity of objects interacting in one dimension. $p = mv$	Investigate the conservation of momentum in elastic collisions, inelastic collisions and explosions.
Knowledge of energy interactions involving the total kinetic energy of systems of objects undergoing inelastic collisions, elastic collisions and explosions.	Investigate the conservation of kinetic energy in elastic collisions, the loss of kinetic energy from the system in an inelastic collision, and the gain of kinetic energy to the system in an explosion.

Our dynamic Universe Mandatory content	Suggested activities
Collisions, explosions, and impulse (continued)	
Use of an appropriate relationship to solve problems involving the total kinetic energy of systems of interacting objects. $E_k = \frac{1}{2}mv^2$	
Use of Newton's third law to explain the motion of objects involved in interactions.	Consider propulsion systems such as jet engines and rockets. Investigate collisions using sensors and data loggers.
Interpretation of force-time graphs involving interacting objects.	
Knowledge that the impulse of a force is equal to the area under a force-time graph and is equal to the change in momentum of an object involved in the interaction.	Consider forces in collisions involving hammers and pile drivers.
Use of data from a force-time graph to solve problems involving the impulse of a force, the average force and its duration.	Consider the role of crumple zones and airbags in car safety.
Use of an appropriate relationship to solve problems involving mass, change in velocity, average force, and duration of the force for an object involved in an interaction. $Ft = mv - mu$	

Our dynamic Universe Mandatory content	Suggested activities
Gravitation	
Description of an experiment to measure the acceleration of a falling object.	Experimental determination of the acceleration due to gravity.
Knowledge that the horizontal motion and the vertical motion of a projectile are independent of each other.	Use software to analyse videos of projectile motion.
Knowledge that satellites are in free fall around a planet/star.	Consider Newton's thought experiment and an explanation of why satellites remain in orbit. Consider low orbit and geostationary satellites. Investigate the use of satellites in communication, surveying and environmental monitoring of the conditions of the atmosphere.
Resolution of the initial velocity of a projectile into horizontal and vertical components, and their use in calculations.	
Use of resolution of vectors, vector addition, and appropriate relationships to solve problems involving projectiles. $d = \bar{v}t$ $s = \bar{v}t$ $v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$ $s = \frac{1}{2}(u+v)t$	
Use of Newton's Law of Universal Gravitation to solve problems involving force, masses and their separation. $F = G\frac{m_1 m_2}{r^2}$	Experimental determination of the gravitational field strength on Earth. Consider the Cavendish Boys experiment. Consider Maskelyne's Schiehallion experiment. Consider the use of the slingshot effect in space travel. Consider lunar and planetary orbits, the formation of the Solar System by the aggregation of matter, and stellar formation and collapse.

Our dynamic Universe Mandatory content	Suggested activities
Special relativity	
Knowledge that the speed of light in a vacuum is the same for all observers. Knowledge that measurements of space, time and distance for a moving observer are changed relative to those for a stationary observer, giving rise to time dilation and length contraction. Use of appropriate relationships to solve problems involving time dilation, length contraction, and speed. $t' = \frac{t}{\sqrt{1-\left(\frac{v}{c}\right)^2}}$ $l' = l\sqrt{1-\left(\frac{v}{c}\right)^2}$	Consideration of Galilean invariance, Newtonian relativity and the concept of absolute space. Newtonian relativity can be experienced in an intuitive way. Examples include walking in a moving train and moving sound sources. Use of animations to study length contraction and time dilation, which are non-intuitive relativistic effects. Consider the experimental verification of special relativity — including muon detection at the surface of the Earth and comparison of time measurements on travelling and stationary clocks. Derive the time dilation equation from the geometrical consideration of a light beam moving relative to a stationary observer.
The expanding Universe	
Knowledge that the Doppler effect causes shifts in wavelengths of sound and light. Use of an appropriate relationship to solve problems involving the observed frequency, source frequency, source speed and wave speed. $f_o = f_s\left(\frac{v}{v \pm v_s}\right)$	Investigate the Doppler effect in terms of sound, for example the apparent change in frequency as a source moves towards or away from a stationary observer. Investigate the apparent shift in frequency using a moving sound source and data logger. Consider applications of the Doppler effect, including measurement of speed (radar), echocardiogram and flow measurement. (Note that the Doppler effect relationships used for sound cannot be used with light from fast moving galaxies because relativistic effects need to be taken into account.)

Our dynamic Universe Mandatory content	Suggested activities
The expanding Universe (continued)	
Knowledge that the light from objects moving away from us is shifted to longer wavelengths (redshift). Knowledge that the redshift of a galaxy is the change in wavelength divided by the emitted wavelength. For slowly moving galaxies, redshift is the ratio of the recessional velocity of the galaxy to the velocity of light. Use of appropriate relationships to solve problems involving redshift, observed wavelength, emitted wavelength and recessional velocity. $z = \frac{\lambda_{observed} - \lambda_{rest}}{\lambda_{rest}}$ $z = \frac{v}{c}$ Use of an appropriate relationship to solve problems involving the Hubble constant, the recessional velocity of a galaxy and its distance from us. $v = H_0 d$	Consider the units used by astronomers — light years and parsecs rather than SI units. Data analysis of measurements of galactic velocity and distance to determine a value for the Hubble constant and an estimate of the age of the Universe.

Our dynamic Universe **Mandatory content**	**Suggested activities**
The expanding Universe (continued)	
Knowledge that the Hubble-Lemaître Law allows us to estimate the age of the Universe. Knowledge that measurements of the velocities of galaxies and their distance from us lead to the theory of the expanding Universe. Knowledge that the mass of a galaxy can be estimated by the orbital speed of stars within it. Knowledge that evidence supporting the existence of dark matter comes from estimations of the mass of galaxies. Knowledge that evidence supporting the existence of dark energy comes from the accelerating rate of expansion of the Universe. Knowledge that the temperature of stellar objects is related to the distribution of emitted radiation over a wide range of wavelengths. Knowledge that the peak wavelength of this distribution is shorter for hotter objects than for cooler objects. Knowledge that hotter objects emit more radiation per unit surface area per unit time than cooler objects.	Consider: ♦ measurements of the velocities of galaxies and their distance from us leading to the theory of the expanding Universe ♦ gravity as the force which slows down the expansion ♦ the eventual fate of the Universe depending on its mass-energy density ♦ the orbital speed of the Sun and other stars giving a way of determining the mass of our galaxy ♦ the Sun's orbital speed being determined almost entirely by the gravitational pull of matter inside its orbit ♦ measurements of the mass of our galaxy and others leading to the conclusion that there is significant mass which cannot be detected — dark matter ♦ measurements of the expansion rate of the Universe leading to the conclusion that it is increasing, suggesting that there is something that overcomes the force of gravity — dark energy ♦ the revival of Einstein's cosmological constant in the context of the accelerating Universe

Our dynamic Universe Mandatory content	Suggested activities
The expanding Universe (continued)	
Knowledge of evidence supporting the Big Bang theory and subsequent expansion of the Universe: cosmic microwave background radiation, the abundance of the elements hydrogen and helium, the darkness of the sky (Olbers' paradox) and the large number of galaxies showing redshift rather than blueshift.	Use of the Hertzsprung-Russell diagram in the study of stellar evolution. Investigate the temperature of hot objects using infrared sensors. Consider the change in colour of steel at high temperatures. Consider the history of cosmic microwave background radiation discovery and measurement, and of the COBE satellite. Consider the peak wavelength of cosmic microwave background radiation. This wavelength corresponds to the temperature that was predicted after the Big Bang. Teaching Astronomy and Space videos are available from the Institute of Physics (IoP), for example: https://www.youtube.com/watch?v=K_xZuopg4Sk https://www.youtube.com/watch?v=jms_vklUeHA

Particles and waves **Mandatory content**	**Suggested activities**
Forces on charged particles	
Knowledge that charged particles experience a force in an electric field. Knowledge that electric fields exist around charged particles and between charged parallel plates. Sketch electric field patterns for single-point charges, systems of two-point charges and between two charged parallel plates (ignore end effects). Determination of the direction of movement of charged particles in an electric field. Definition of voltage (potential difference) in terms of work done and charge. Use of appropriate relationships to solve problems involving the charge, mass, speed and energy of a charged particle in an electric field, and the potential difference through which it moves. $W = QV$ $E_k = \frac{1}{2}mv^2$	Consider electrostatic hazards, for example lightning and potential damage to microchips. Research practical applications that use electric fields, for example precipitators, Xerography, paint spraying, inkjet printing and electrostatic propulsion. Demonstrate electron beams using Teltron tubes.

Particles and waves Mandatory content	Suggested activities
Forces on charged particles (continued)	
Knowledge that a moving charge produces a magnetic field.	
Determination of the direction of the force on a charged particle moving in a magnetic field for negative and positive charges.	Use of the right-hand rule.
Knowledge of the basic operation of particle accelerators in terms of acceleration by electric fields, deflection by magnetic fields and high-energy collisions of charged particles to produce other particles.	Consider: ♦ accelerators, including linear accelerator, cyclotron and synchrotron ♦ medical applications of the cyclotron ♦ the use of accelerators to investigate the structure of matter, for example the LHC at CERN
The Standard Model	
Knowledge that the Standard Model is a model of fundamental particles and interactions.	
Use of orders of magnitude and awareness of the range of orders of magnitude of length from the very small (sub-nuclear) to the very large (distance to furthest known celestial objects).	Consider the scale of our macro world compared to astronomical and sub-nuclear scales. A useful animation that allows candidates to visualise orders of magnitude can be found at: http://htwins.net/scale2/
Knowledge that evidence for the existence of quarks comes from high-energy collisions between electrons and nucleons, carried out in particle accelerators.	Consider experiments carried out in the LHC at CERN.
Knowledge that in the Standard Model, every particle has an antiparticle and that the production of energy in the annihilation of particles is evidence for the existence of antimatter.	Use of the sub-atomic Particle Zoo App (and toys). Consider the uses of the PET scanner.

Particles and waves Mandatory content	Suggested activities
The Standard Model (continued)	
Description of beta decay as the first evidence for the neutrino. $^{1}_{0}n \rightarrow {}^{1}_{1}p + {}^{0}_{-1}e + \bar{\nu}_{e}$ (β+ decay not required) Knowledge that fermions, the matter particles, consist of quarks (six types: up, down, strange, charm, top, bottom) and leptons (electron, muon and tau, together with their neutrinos). Knowledge that hadrons are composite particles made of quarks. Knowledge that baryons are made of three quarks. Knowledge that mesons are made of quark-antiquark pairs. Knowledge that the force-mediating particles are bosons: photons (electromagnetic force), W- and Z-bosons (weak force) and gluons (strong force).	Consideration of the Higgs boson — history, discovery and implications. Discuss the linking of electromagnetic, strong and weak forces, but not, as yet, of gravity.

Particles and waves Mandatory content	Suggested activities
Nuclear reactions	
Use of nuclear equations to describe radioactive decay, fission (spontaneous and induced) and fusion reactions, with reference to mass and energy equivalence. Use of an appropriate relationship to solve problems involving the mass loss and the energy released by a nuclear reaction. $E = mc^2$ Knowledge that nuclear fusion reactors require charged particles at a very high temperature (plasma) which have to be contained by magnetic fields.	Consider examples of radioactive decay series. Compare the energy available from chemical and nuclear sources. Consideration of the magnetic containment of plasma, for example in the Joint European Torus (JET) and ITER tokamak.
Inverse square law	
Knowledge that irradiance is the power per unit area incident on a surface. Use of an appropriate relationship to solve problems involving irradiance, the power of radiation incident on a surface and the area of the surface. $I = \frac{P}{A}$ Knowledge that irradiance is inversely proportional to the square of the distance from a point source.	

Particles and waves Mandatory content	Suggested activities
Inverse square law (continued)	
Description of an experiment to verify the inverse square law for a point source of light. Use of an appropriate relationship to solve problems involving irradiance and distance from a point source of light. $I = \frac{k}{d^2}$ $I_1 d_1^2 = I_2 d_2^2$	Investigate irradiance as a function of distance from a point source of light. Application of the inverse square law to other e-m radiation. Compare irradiance as a function of distance from a point source of light with irradiance as a function of distance from a laser.
Wave-particle duality	
Knowledge that the photoelectric effect is evidence for the particle model of light. Knowledge that photons of sufficient energy can eject electrons from the surface of materials (photoemission). Use of an appropriate relationship to solve problems involving the frequency and energy of a photon. $E = hf$ Knowledge that the threshold frequency is the minimum frequency of a photon required for photoemission. Knowledge that the work function of a material is the minimum energy of a photon required to cause photoemission.	Demonstrate the photoelectric effect using a gold-leaf electroscope. Consider practical applications of photoemission, for example light meters in cameras, channel plate image intensifiers, photomultipliers.

Particles and waves **Mandatory content**	**Suggested activities**
Wave-particle duality (continued)	
Use of appropriate relationships to solve problems involving the mass, maximum kinetic energy and speed of photoelectrons, the threshold frequency of the material, and the frequency and wavelength of the photons. $E_k = hf - hf_0$ $E_k = \frac{1}{2}mv^2$ $v = f\lambda$	
Interference	
Knowledge that interference is evidence for the wave model of light. Knowledge that coherent waves have a constant phase relationship. Description of the conditions for constructive and destructive interference in terms of the phase difference between two waves. Knowledge that maxima and minima are produced when the path difference between waves is a whole number of wavelengths or an odd number of half-wavelengths respectively.	Investigation of interference patterns with microwaves, radio waves, sound, light and electrons. Consider practical applications, for example holography, the industrial imaging of surfaces in stress analysis, and the coating of lenses in optical instruments. Observe interference colours, for example thin films of petrol on water or soap bubbles.

Particles and waves Mandatory content	Suggested activities
Interference (continued)	
Use of an appropriate relationship to solve problems involving the path difference between waves, wavelength and order number. $\text{path difference} = m\lambda \; or \; \left(m + \frac{1}{2}\right)\lambda \;\; \text{where } m = 0,1,2...$ Use of an appropriate relationship to solve problems involving grating spacing, wavelength, order number and angle to the maximum. $d \sin\theta = m\lambda$	Investigation with microwaves leading to the relationship between the wavelength, path difference and order number. Investigations using a grating leading to the relationship between the grating spacing, wavelength, and angle to a maximum. Investigate the effect on fringe separation of varying distance between the grating and the screen. Use of interferometers to measure small changes in path difference.
Spectra	
Knowledge of the Bohr model of the atom. Knowledge of the terms 'ground state', 'energy levels', 'ionisation' and 'zero potential energy' in relation to the Bohr model of the atom. Knowledge of the mechanism of production of line emission spectra, continuous emission spectra, and absorption spectra in terms of electron energy level transitions. Use of appropriate relationships to solve problems involving energy levels and the frequency of the radiation emitted/absorbed. $E_2 - E_1 = hf$ $E = hf$ Knowledge that the absorption lines (Fraunhofer lines) in the spectrum of sunlight provide evidence for the composition of the Sun's outer atmosphere.	Use of a spectroscope/spectrometer/spectrophotometer to examine line and continuous spectra, for example from a tungsten filament lamp, an electric heater element, fluorescent tubes, gas discharge tubes, or various salts in a Bunsen flame. Use a sodium discharge lamp to produce a shadow of a sodium flame. Consider practical uses of spectroscopy, for example in extending our knowledge of space.

Particles and waves **Mandatory content**	**Suggested activities**
Refraction of light	
Definition of absolute refractive index of a medium as the ratio of the speed of light in a vacuum to the speed of light in the medium. Use of an appropriate relationship to solve problems involving absolute refractive index, the angle of incidence and the angle of refraction. $n = \frac{\sin\theta_1}{\sin\theta_2}$ Description of an experiment to determine the refractive index of a medium. Use of appropriate relationships to solve problems involving the angles of incidence and refraction, the wavelength of light in each medium, the speed of light in each medium, and the frequency, including situations where light is travelling from a more dense to a less dense medium. $\frac{\sin\theta_1}{\sin\theta_2} = \frac{\lambda_1}{\lambda_2} = \frac{v_1}{v_2}$ $v = f\lambda$ Knowledge that the refractive index of a medium increases as the frequency of incident radiation increases.	Consider applications of refraction, for example lens design and colours seen in cut diamonds. Experiments to determine the refractive index of different transparent materials, for example glass and Perspex.

Particles and waves Mandatory content	Suggested activities
Refraction of light (continued)	
Definition of critical angle as the angle of incidence that produces an angle of refraction of 90°. Knowledge that total internal reflection occurs when the angle of incidence is greater than the critical angle. Use of an appropriate relationship to solve problems involving critical angle and absolute refractive index. $\sin\theta_c = \frac{1}{n}$	Consider applications of total internal reflection, for example reflective road signs, prism reflectors (binoculars, periscopes, SLR cameras), and the use of optical fibres for communications, medicine and sensors. Investigate total internal reflection, including critical angle and its relationship with refractive index.

Electricity **Mandatory content**	**Suggested activities**
Monitoring and measuring AC	
Knowledge that AC is a current that changes direction and instantaneous value with time. Use of appropriate relationships to solve problems involving root mean square (rms) and peak values. $V_{rms} = \frac{V_{peak}}{\sqrt{2}}$ $I_{rms} = \frac{I_{peak}}{\sqrt{2}}$ Determination of frequency, peak and rms values from graphical data. $T = \frac{1}{f}$	Use an oscilloscope to monitor AC signals, including the measurement of frequency, peak and rms values.

Electricity **Mandatory content**	**Suggested activities**
Current, potential difference, power, and resistance	
Use of appropriate relationships to solve problems involving potential difference, current, power and resistance. Solutions may involve several steps. $V = IR$ $P = IV = I^2R = \frac{V^2}{R}$ $R_T = R_1 + R_2 + \ldots$ $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$	Investigate circuits with switches and resistive components.
Use of appropriate relationships to solve problems involving potential divider circuits. $V_1 = \left(\frac{R_1}{R_1 + R_2}\right)V_S$ $\frac{V_1}{V_2} = \frac{R_1}{R_2}$	Use of potential dividers to set and control voltages in circuits.

Electricity Mandatory content	Suggested activities
Electrical sources and internal resistance	
Knowledge of the terms ‘electromotive force (EMF)’, ‘internal resistance’, ‘lost volts’, ‘terminal potential difference (t.p.d.)’, ‘ideal supplies’, ‘short circuit’ and ‘open circuit’. Use of appropriate relationships to solve problems involving EMF, lost volts, t.p.d., current, external resistance and internal resistance. $E = V + Ir$ $V = IR$ Description of an experiment to measure the EMF and internal resistance of a cell. Determination of EMF, internal resistance, and short circuit current using graphical analysis.	Determination of the EMF and internal resistance of cells. Investigate load matching. Maximum power is transferred when internal and external resistances are equal. Investigate the variation of t.p.d. of a low voltage supply as a function of external resistance, including the addition of resistors connected in parallel with the supply.

Electricity **Mandatory content**	**Suggested activities**
Capacitors	
Knowledge that a capacitor of 1 farad will store 1 coulomb of charge when the potential difference across it is 1 volt. Use of an appropriate relationship to solve problems involving capacitance, charge and potential difference. $C = \frac{Q}{V}$ Use of an appropriate relationship to determine the charge stored on a capacitor for a constant charging current. $Q = It$ Knowledge that the total energy stored in a charged capacitor is equal to the area under a charge-potential difference graph. Use of appropriate relationships to solve problems involving energy, charge, capacitance, and potential difference. $E = \frac{1}{2}QV = \frac{1}{2}CV^2 = \frac{1}{2}\frac{Q^2}{C}$ Knowledge of the variation of current and potential difference with time for both charging and discharging cycles of a capacitor in an RC circuit (charging and discharging curves).	Experimental determination of the capacitance of a capacitor. Consider practical uses of capacitors, for example energy storage, flash bulbs, smoothing and suppressing, and in capacitance-based touch screens.

Electricity Mandatory content	Suggested activities
Capacitors (continued)	
Knowledge of the effect of resistance and capacitance on charging and discharging curves in an RC circuit. Description of experiments to investigate the variation of current in a capacitor and voltage across a capacitor with time, for the charging and discharging of capacitors.	Investigate the charging/discharging of a capacitor using data loggers or other methods.
Semiconductors and p-n junctions	
Knowledge of the terms ‘conduction band’ and ‘valence band’. Knowledge that solids can be categorised into conductors, semiconductors or insulators by their band structure and their ability to conduct electricity. Every solid has its own characteristic energy band structure. For a solid to be conductive, both free electrons and accessible empty states must be available. Qualitative explanation of the electrical properties of conductors, insulators and semiconductors using the electron population of the conduction and valence bands, and the energy difference between the conduction and valence bands. (Reference to Fermi levels is not required.) The electrons in atoms are contained in energy levels. When the atoms come together to form solids, the electrons then become contained in energy bands separated by gaps. For metals we have the situation where one or more bands are partially filled.	Consider conducting and insulating materials in terms of the electron population of the conduction band. Consider the breakdown voltage of an insulator, for example in the context of lightning. A computer simulation will be available from Strathclyde University.

Electricity **Mandatory content**	**Suggested activities**
Semiconductors and p-n junctions (continued)	
Some metals have free electrons and partially filled valence bands, therefore they are highly conductive. Some metals have overlapping valence and conduction bands. Each band is partially filled and therefore they are conductive. In an insulator, the highest occupied band (called the valence band) is full. The first unfilled band above the valence band is the conduction band. For an insulator, the gap between the valence band and the conduction band is large and at room temperature there is not enough energy available to move electrons from the valence band into the conduction band where they would be able to contribute to conduction. There is no electrical conduction in an insulator. In a semiconductor, the gap between the valence band and conduction band is smaller and at room temperature there is sufficient energy available to move some electrons from the valence band into the conduction band allowing some conduction to take place. An increase in temperature increases the conductivity of a semiconductor. Knowledge that, during manufacture, semiconductors may be doped with specific impurities to increase their conductivity, resulting in two types of semiconductor: p-type and n-type.	

Electricity Mandatory content	Suggested activities
Semiconductors and p-n junctions (continued)	
Knowledge that, when a semiconductor contains the two types of doping (p-type and n-type) in adjacent layers, a p-n junction is formed. There is an electric field in the p-n junction. The electrical properties of this p-n junction are used in a number of devices. Knowledge of the terms 'forward bias' and 'reverse bias'. Forward bias reduces the electric field; reverse bias increases the electric field in the p-n junction.	
Knowledge that LEDs are forward biased p-n junction diodes that emit photons. The forward bias potential difference across the junction causes electrons to move from the conduction band of the n-type semiconductor towards the conduction band of the p-type semiconductor. Photons are emitted when electrons 'fall' from the conduction band into the valence band either side of the junction.	Investigate the operation of a Hall effect sensor. Investigate the variation in resistance of a negative temperature coefficient thermistor as a function of its temperature. Investigate the switch on voltage of LEDs emitting different frequencies of light.
Knowledge that solar cells are p-n junctions designed so that a potential difference is produced when photons are absorbed. (This is known as the photovoltaic effect.) The absorption of photons provides energy to 'raise' electrons from the valence band of the semiconductor to the conduction band. The p-n junction causes the electrons in the conduction band to move towards the n-type semiconductor and a potential difference is produced across the solar cell.	Investigate the variation in the output voltage of a solar cell as a function of the irradiance and frequency of incident light.

Units, prefixes and uncertainties Mandatory content	Suggested activities
Units, prefixes and scientific notation	
Appropriate use of units and prefixes. SI units should be used with all physical quantities, where appropriate. Prefixes should be used where appropriate. These include pico (p), nano (n), micro (μ), milli (m), kilo (k), mega (M), giga (G) and tera (T). Use of the appropriate number of significant figures in final answers. This means that the final answer can have no more significant figures than the value with the fewest number of significant figures used in the calculation. Appropriate use of scientific notation	
Uncertainties	
Knowledge of scale reading, random and systematic uncertainties in a measured quantity. All measurements of physical quantities are liable to uncertainty, which should be expressed in absolute or percentage form. Scale reading uncertainty is an indication of how precisely an instrument scale can be read. Random uncertainties arise when measurements are repeated and slight variations occur. Random uncertainties may be reduced by increasing the number of repeated measurements.	

Units, prefixes and uncertainties Mandatory content	Suggested activities
Uncertainties (continued)	
Use of an appropriate relationship to determine the approximate random uncertainty in a value using repeated measurements. $$random\ uncertainty = \frac{max.\ value\ -\ min.\ value}{number\ of\ values}$$ or $$\Delta R = \frac{R_{\max} - R_{\min}}{n}$$ Systematic uncertainties occur when readings taken are either all too small or all too large. This can arise due to measurement techniques or experimental design. The mean of a set of repeated measurements is the best estimate of the 'true' value of the quantity being measured. When systematic uncertainties are present, the mean value will be offset. When mean values are used, the approximate random uncertainty should be calculated. Appropriate use of uncertainties in data analysis.	

Units, prefixes and uncertainties Mandatory content	Suggested activities
Uncertainties (continued)	
When an experiment is being undertaken and more than one physical quantity is measured, the quantity with the largest percentage uncertainty should be identified and this may often be used as a good estimate of the percentage uncertainty in the final numerical result of an experiment. The numerical result of an experiment should be expressed in the form *final value ± uncertainty.* The mean of a set of repeated measurements is the best estimate of the 'true' value of the quantity being measured. When systematic uncertainties are present, the mean value will be offset. When mean values are used, the approximate random uncertainty should be calculated. Appropriate use of uncertainties in data analysis. When an experiment is being undertaken and more than one physical quantity is measured, the quantity with the largest percentage uncertainty should be identified and this may often be used as a good estimate of the percentage uncertainty in the final numerical result of an experiment. The numerical result of an experiment should be expressed in the form *final value ± uncertainty.*	

Preparing for course assessment

Each course has additional time which may be used at the discretion of teachers and/or lecturers to enable candidates to prepare for course assessment. This time may be used near the start of the course and at various points throughout the course for consolidation and support. It may also be used towards the end of the course, for further integration, revision and preparation.

The question papers assess a selection of knowledge and skills acquired in the course. It also provides opportunities to apply skills in a range of contexts, some of which may be unfamiliar.

During delivery of the course, teachers and lecturers should give candidates opportunities to:

- identify particular aspects of work requiring reinforcement and support
- develop skills of scientific inquiry and investigation in preparation for the assignment
- practise responding to multiple-choice, short-answer, extended-answer and open-ended questions
- improve exam technique

Developing skills for learning, skills for life and skills for work

Teachers and/or lecturers should identify opportunities throughout the course for candidates to develop skills for learning, skills for life and skills for work.

Candidates should be aware of the skills they are developing and you can provide advice on opportunities to practise and improve them.

Qualifications Scotland does not formally assess skills for learning, skills for life and skills for work.

There may also be opportunities to develop additional skills depending on approaches being used to deliver the course in each centre. This is for individual teachers and lecturers to manage.

During this course, candidates should significantly develop the following skills for learning, skills for life and skills for work:

Literacy

Writing means the ability to create texts which communicate ideas, opinions and information, to meet a purpose and within a context. In this context, 'texts' are defined as word-based materials (sometimes with supporting images) which are written, printed, Braille or displayed on screen. These will be technically accurate for the purpose, audience and context.

1.2 Writing

Candidates develop the skills to effectively communicate key areas of physics, make informed decisions and describe physics issues in various media forms.

Candidates have the opportunity to communicate applied knowledge and understanding throughout the course, with an emphasis on applications.

Candidates have opportunities to develop literacy skills of listening and reading, when gathering and processing information in physics.

Numeracy

This is the ability to use numbers in order to solve problems by counting, doing calculations, measuring, and understanding graphs and charts. This is also the ability to understand the results.

Candidates have opportunities to extract, process and interpret information presented in numerous formats including tabular and graphical. Practical work will provide opportunities to develop time and measurement skills.

2.1 Number processes

Number processes means solving problems arising in everyday life through carrying out calculations, when dealing with data and results from experiments/investigations and everyday class work, making informed decisions based on the results of these calculations and understanding these results.

2.2 Money, time and measurement

This means using and understanding time and measurement to solve problems and handle data in a variety of physics contexts, including practical and investigative.

2.3 Information handling

Information handling means being able to interpret physics data in tables, charts and other graphical displays to draw sensible conclusions throughout the course. It involves interpreting the data and considering its reliability in making reasoned deductions and informed decisions. It also involves an awareness and understanding of the chance of events happening.

Thinking skills

This is the ability to develop the cognitive skills of remembering and identifying, understanding and applying.

The course allows candidates to develop skills of applying, analysing and evaluating. Candidates can analyse and evaluate practical work and data by reviewing the process, identifying issues and forming valid conclusions. They can demonstrate understanding and application of key areas and explain and interpret information and data.

5.3 Applying

Applying is the ability to use existing information to solve physics problems in different contexts, and to plan, organise and complete a task such as an investigation.

5.4 Analysing and evaluating

Analysis is the ability to solve problems in physics and make decisions that are based on available information. It may involve the review and evaluation of relevant information and/or prior knowledge to provide an explanation.

It may build on selecting and/or processing information, so is a higher-level skill.

5.5 Creating

This is the ability to design something innovative or to further develop an existing thing by adding new dimensions or approaches. Candidates can demonstrate their creativity, in particular, when planning and designing physics experiments or investigations. Candidates have the opportunity to be innovative in their approach. Candidates also have opportunities to make, write, say or do something new.

Candidates also have opportunities to develop working with others and citizenship.

Working with others

Learning activities provide many opportunities, in all areas of the course, for candidates to work with others. Practical activities and investigations, in particular, offer opportunities for group work, which is an important aspect of physics, and which centres should encourage.

Citizenship

Candidates develop citizenship skills, when considering the applications of physics on our lives, as well as environmental and ethical implications.

Administrative information

Published: June 2026 (version 4.0)

History of changes

Version	Description of change	Date
2.0	Course support notes added as appendix.	September 2018
3.0	‘Mandatory knowledge’ sub-sections: Hubble’s Law has been renamed as the Hubble-Lemaître Law. Assignment section, ‘Resources’ sub-section: ♦ information added that there must be a range of topics available for candidates to choose from and that teachers/lecturers must minimise the numbers investigating the same topic within a class ♦ teachers/lecturers can supply a basic list of instructions for the experimental procedure ♦ information added to the bullet points about raw experimental data, internet/literature data and extracts ♦ candidates must undertake research using only websites, journals and/or books ♦ list of items that candidates cannot have access to in the report stage replaced with ‘Candidates **must not** have access to a previously prepared draft of a report or any part of a report.’	September 2019
4.0	We’ve changed the course assessment from two question papers and an assignment to one question paper comprising two sections, and an assignment. For the question paper, we’ve: ♦ reduced the marks for Section 1 from 25 to 20, and removed the scaling ♦ reduced the marks from Section 2 from 130 to 110, and removed the scaling ♦ reduced the combined duration of the question paper from 3 hours to 2 hours 30 minutes for both sections	June 2026

Version	Description of change	Date
4.0 (cont)	The assignment still has 20 marks, and we've changed the scaling from 30 to 33. We've amended the details in the 'Course overview' and 'Course assessment' sections accordingly. We've added information to the 'Appendix' section to support teachers and lecturers. We've changed references to 'SQA' to 'Qualifications Scotland' throughout. We've updated the title to include the SCQF level. We've added a new 'Learning for Sustainability' section and updated the 'Equality and inclusion' and 'Further information' sections. We've made changes to the format and layout of the document to improve accessibility. **What you need to do differently** You must give candidates the opportunity to carry out a wide range of experimental work. You may wish to update prelims to match the updated format and duration of the question paper.	June 2026 (cont)

Note: please check Qualifications Scotland's website to ensure you are using the most up-to-date version of this document.