National 5
Course
Specification

National 5 Physics

Course code:	C857 75
Course assessment code:	X857 75
SCQF:	level 5 (24 SCQF credit points)
Valid from:	session 2017–18

The course specification 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: April 2017, version 1.0

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 a candidate to complete the course is 160 hours.

The course assessment has two components.

Component	Marks	Scaled mark	Duration
Component 1: question paper	135	100	2 hours and 30 minutes
Component 2: assignment	20	25	8 hours of which a maximum of 1 hour and 30 minutes is allocated to the reporting stage — see course assessment section

Recommended entry	Progression
Entry to this course is at the discretion of the centre. Candidates should have achieved the fourth curriculum level or the National 4 Physics course or equivalent qualifications and/or experience prior to starting this course. Candidates may also progress from relevant biology, chemistry, environmental science or science courses.	♦ other qualifications in physics or related areas ♦ further study, employment 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 more time for learning, more focus on skills and applying learning, and 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.

Physics is the study of matter, energy and the interaction between them. This entails asking fundamental questions and trying to answer them by observing and experimenting. The answers to such questions can lead to advances in our understanding of the world around us and often result in technological improvements which enhance the lives of all. The study of physics is of benefit, not only to those intending to pursue a career in science, but also to those intending to work in areas such as the health, energy, leisure and computing industries.

An experimental and investigative approach is used to develop knowledge and understanding of concepts in physics.

Purpose and aims

The purpose of the course is to develop candidates' interest and enthusiasm for physics in a range of contexts. The skills of scientific inquiry are integrated and developed, throughout the course, by investigating the applications of physics. This enables candidates to become scientifically literate citizens, able to review the science-based claims they will meet.

Physics gives candidates an insight into the underlying nature of our world and its place in the universe. From the sources of the energy we use, to the exploration of space, it covers a range of applications of the relationships that have been discovered through experiment and calculation, including those used in modern technology. An experimental and investigative approach is used to develop knowledge and understanding of physics concepts.

This course enables candidates to develop a deeper understanding of physics concepts and the ability to describe and interpret physical phenomena using mathematical skills. They develop scientific methods of research in which issues in physics are explored and conclusions drawn.

The aims of the course are for candidates to:

- develop and apply knowledge and understanding of physics
- develop an understanding of the impact of physics on everyday life
- develop an understanding of the role of physics in scientific issues and relevant applications of physics, including the impact these could make on society and the environment
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills 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, in everyday contexts, 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

The course enables candidates to make their own decisions on issues within a modern society, where the body of scientific knowledge and its applications and implications are ever developing.

Who is this course for?

The course is suitable for learners who have experienced learning across the sciences experiences and outcomes. The course may be suitable for those wishing to study physics for the first time.

This course has a skills-based approach to learning. It takes account of the needs of all learners and provides sufficient flexibility to enable learners to achieve in different ways.

Course content

Candidates gain an understanding of physics and develop this through a variety of approaches, including practical activities, investigations and problem solving. Candidates research topics, apply scientific skills and communicate information related to their findings, which develops skills of scientific literacy.

The course content includes the following areas of physics:

Dynamics
In this area, the topics covered are: vectors and scalars; velocity–time graphs; acceleration; Newton's laws; energy; projectile motion.

Space
In this area, the topics covered are: space exploration; cosmology.

Electricity
In this area, the topics covered are: electrical charge carriers; potential difference (voltage); Ohm's law; practical electrical and electronic circuits; electrical power.

Properties of matter
In this area, the topics covered are: specific heat capacity; specific latent heat; gas laws and the kinetic model.

Waves
In this area, the topics covered are: wave parameters and behaviours; electromagnetic spectrum; refraction of light.

Radiation
In this area, the topic covered is nuclear radiation.

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
- demonstrating knowledge and understanding of physics by describing information and providing explanations and integrating knowledge
- applying knowledge of physics to new situations, interpreting information and solving problems
- planning or designing experiments to test given hypotheses or to illustrate particular effects, including safety measures
- carrying out experimental procedures safely
- selecting information from a variety of sources

- presenting information appropriately in a variety of forms
- processing information (using calculations and units, where appropriate)
- making predictions based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- evaluating experimental procedures
- suggesting improvements to experiments/practical investigations
- communicating findings/information

Skills, knowledge and understanding for the course assessment

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

Dynamics
Vectors and scalars
Definition of vector and scalar quantities. Identification of force, speed, velocity, distance, displacement, acceleration, mass, time and energy as vector or scalar quantities. Calculation of the resultant of two vector quantities in one dimension or at right angles. Determination of displacement and/or distance using scale diagram or calculation. Determination of velocity and/or speed using scale diagram or calculation. Use of appropriate relationships to solve problems involving velocity, speed displacement, distance and time. $s = vt$ $s = \bar{v}t$ $d = \bar{v}t$ Description of experiments to measure average and instantaneous speed.
Velocity–time graphs
Drawing or sketching of velocity–time or speed–time graphs from data. Interpretation of a velocity–time graph to describe the motion of an object. Determination of displacement from a velocity–time graph. $s = \text{area under } v\text{-}t \text{ graph.}$
Acceleration
Definition of acceleration in terms of initial velocity, final velocity and time. Use of an appropriate relationship to solve problems involving acceleration, initial velocity (or speed), final velocity (or speed) and time. $a = \frac{v - u}{t}$ Determination of acceleration from a velocity–time graph. $a = \text{gradient of the line on a } v\text{-}t \text{ graph.}$ Description of an experiment to measure acceleration.

Dynamics
Newton's laws
Application of Newton's laws and balanced forces to explain constant velocity (or speed), making reference to frictional forces. Application of Newton's laws and unbalanced forces to explain and/or determine acceleration for situations where more than one force is acting. Use of an appropriate relationship to solve problems involving unbalanced force, mass and acceleration for situations where one or more forces are acting in one dimension or at right angles. $F = ma$ Use of an appropriate relationship to solve problems involving weight, mass and gravitational field strength. $W = mg$ Explanation of motion resulting from a 'reaction' force in terms of Newton's third law. Explanation of free-fall and terminal velocity in terms of Newton's laws.
Energy
Explanation of energy conservation and of energy conversion and transfer. Use of an appropriate relationship to solve problems involving work done, unbalanced force and distance/displacement. $E_w = Fd$, or $W = Fd$ Definition of gravitational potential energy. Use of an appropriate relationship to solve problems involving gravitational potential energy, mass, gravitational field strength and height. $E_p = mgh$ Definition of kinetic energy. Use of an appropriate relationship to solve problems involving kinetic energy, mass and speed. $E_k = \frac{1}{2}mv^2$ Use of appropriate relationships to solve problems involving conservation of energy. $E_w = Fd$, $W = Fd$ $E_p = mgh$ $E_k = \frac{1}{2}mv^2$

Dynamics
Projectile motion
Explanation of projectile motion in terms of constant vertical acceleration and constant horizontal velocity. Use of appropriate relationships to solve problems involving projectile motion from a horizontal launch, including the use of motion graphs. area under v_h-t graphs (horizontal range) area under v_v-t graphs (vertical height) $v_h = \frac{s}{t}$ (constant horizontal velocity) $v_v = u_v + at$ (constant vertical acceleration) Explanation of satellite orbits in terms of projectile motion, horizontal velocity and weight.

Space
Space exploration
Basic awareness of our current understanding of the universe. Use of the following terms correctly and in context: planet, dwarf planet, moon, Sun, asteroid, solar system, star, exoplanet, galaxy, universe. Awareness of the benefits of satellites: GPS, weather forecasting, communications, scientific discovery and space exploration (for example Hubble telescope, ISS). Knowledge that geostationary satellites have a period of 24 hours and orbit at an altitude of 36 000 km. Knowledge that the period of a satellite in a high altitude orbit is greater than the period of a satellite in a lower altitude orbit. Awareness of the challenges of space travel: ♦ travelling large distances with the possible solution of attaining high velocity by using ion drive (producing a small unbalanced force over an extended period of time) ♦ travelling large distances using a ‘catapult’ from a fast moving asteroid, moon or planet ♦ manoeuvring a spacecraft in a zero friction environment, possibly to dock with the ISS ♦ maintaining sufficient energy to operate life support systems in a spacecraft, with the possible solution of using solar cells with area that varies with distance from the Sun Awareness of the risks associated with manned space exploration: ♦ fuel load on take-off ♦ potential exposure to radiation ♦ pressure differential ♦ re-entry through an atmosphere Knowledge of Newton’s second and third laws and their application to space travel, rocket launch and landing. Use of an appropriate relationship to solve problems involving weight, mass and gravitational field strength, in different locations in the universe. $W = mg$
Cosmology
Use of the term ‘light year’ and conversion between light years and metres. Basic description of the ‘Big Bang’ theory of the origin of the universe. Knowledge of the approximate estimated age of the universe. Awareness of the use of the whole electromagnetic spectrum in obtaining information about astronomical objects. Identification of continuous and line spectra. Use of spectral data for known elements, to identify the elements present in stars.

Electricity

Electrical charge carriers

Definition of electrical current as the electric charge transferred per unit time.
Use of an appropriate relationship to solve problems involving charge, current and time.

$$Q = It$$

Knowledge of the difference between alternating and direct current.
Identification of a source (as a.c. or d.c.) based on oscilloscope trace or image from data logging software.

Potential difference (voltage)

Knowledge that a charged particle experiences a force in an electric field.

Knowledge of the path a charged particle follows: between two oppositely charged parallel plates; near a single point charge; between two oppositely charged points; between two like charged points.

Knowledge that the potential difference (voltage) of the supply is a measure of the energy given to the charge carriers in a circuit.

Ohm's law

Calculation of the gradient of the line of best fit on a *V-I* graph to determine resistance.
Use of appropriate relationships to solve problems involving potential difference (voltage), current and resistance.

$$V = IR$$

$$V_2 = \left(\frac{R_2}{R_1 + R_2}\right)V_s$$

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

Knowledge of the qualitative relationship between the temperature and resistance of a conductor.
Description of an experiment to verify Ohm's law.

Practical electrical and electronic circuits

Measurement of current, potential difference (voltage) and resistance, using appropriate meters in simple and complex circuits.
Knowledge of the circuit symbol, function and application of standard electrical and electronic components: cell, battery, lamp, switch, resistor, voltmeter, ammeter, LED, motor, microphone, loudspeaker, photovoltaic cell, fuse, diode, capacitor, thermistor, LDR, relay, transistor.
For transistors, knowledge of the symbols for an npn transistor and an n-channel enhancement mode MOSFET. Explanation of their function as a switch in transistor switching circuits.

Electricity
Application of the rules for current and potential difference (voltage) in series and parallel circuits. $I_s = I_1 = I_2 = ...$ $V_s = V_1 + V_2 + ...$ $I_p = I_1 + I_2 + ...$ $V_p = V_1 = V_2 = ...$ Knowledge of the effect on the total resistance of a circuit of adding further resistance in series or in parallel. Use of appropriate relationships to solve problems involving the total resistance of resistors in series and in parallel circuits, and in circuits with a combination of series and parallel resistors. $R_T = R_1 + R_2 + ...$ $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + ...$

Electrical power
Definition of electrical power in terms of electrical energy and time. Use of an appropriate relationship to solve problems involving energy, power and time. $P = \frac{E}{t}$ Knowledge of the effect of potential difference (voltage) and resistance on the current in and power developed across components in a circuit. Use of appropriate relationships to solve problems involving power, potential difference (voltage), current and resistance in electrical circuits. $P = IV$ $P = I^2R$ $P = \frac{V^2}{R}$ Selection of an appropriate fuse rating given the power rating of an electrical appliance. A 3 A fuse should be selected for most appliances rated up to 720 W, a 13 A fuse for appliances rated over 720 W.

Properties of matter
Specific heat capacity
Knowledge that different materials require different quantities of heat to raise the temperature of unit mass by one degree Celsius. Use of an appropriate relationship to solve problems involving mass, heat energy, temperature change and specific heat capacity. $E_h = cm\Delta T$ Knowledge that the temperature of a substance is a measure of the mean kinetic energy of its particles. Use of the principle of conservation of energy to determine heat transfer.
Specific latent heat
Knowledge that different materials require different quantities of heat to change the state of unit mass. Knowledge that the same material requires different quantities of heat to change the state of unit mass from solid to liquid (fusion) and to change the state of unit mass from liquid to gas (vaporisation). Use of an appropriate relationship to solve problems involving mass, heat energy and specific latent heat. $E_h = ml$
Gas laws and the kinetic model
Definition of pressure in terms of force and area. Use of an appropriate relationship to solve problems involving pressure, force and area. $p = \frac{F}{A}$ Description of how the kinetic model accounts for the pressure of a gas. Knowledge of the relationship between Kelvin and degrees Celsius and the absolute zero of temperature. $0\,\text{K} = -273\,^{\circ}\text{C}$ Explanation of the pressure–volume, pressure–temperature and volume–temperature laws qualitatively in terms of a kinetic model. Use of appropriate relationships to solve problems involving the volume, pressure and temperature of a fixed mass of gas. $p_1V_1 = p_2V_2$ $\frac{p_1}{T_1} = \frac{p_2}{T_2}$ $\frac{V_1}{T_1} = \frac{V_2}{T_2}$ $\frac{pV}{T} = \text{constant}$ Description of experiments to verify the pressure–volume law (Boyle's law), the pressure–temperature law (Gay-Lussac's law) and the volume–temperature law (Charles' law).

Waves
Wave parameters and behaviours
Knowledge that waves transfer energy. Definition of transverse and longitudinal waves. Knowledge that sound is an example of a longitudinal wave and electromagnetic radiation and water waves are examples of transverse waves. Determination of the frequency, period, wavelength, amplitude and wave speed for longitudinal and transverse waves. Use of appropriate relationships to solve problems involving wave speed, frequency, period, wavelength, distance, number of waves and time. $v = \frac{d}{t}$ $f = \frac{N}{t}$ $v = f\lambda$ $T = \frac{1}{f}$ Knowledge that diffraction occurs when waves pass through a gap or around an object. Comparison of long wave and short wave diffraction. Draw diagrams using wavefronts to show diffraction when waves pass through a gap or around an object.
Electromagnetic spectrum
Knowledge of the relative frequency and wavelength of bands of the electromagnetic spectrum. Knowledge of typical sources, detectors and applications for each band in the electromagnetic spectrum. Knowledge that all radiations in the electromagnetic spectrum are transverse and travel at the speed of light.
Refraction of light
Knowledge that refraction occurs when waves pass from one medium to another. Description of refraction in terms of change of wave speed, change in wavelength and change of direction (where the angle of incidence is greater than 0°), for waves passing into both a more dense and a less dense medium. Identification of the normal, angle of incidence and angle of refraction in ray diagrams showing refraction.

Radiation
Nuclear radiation
Knowledge of the nature of alpha (α), beta (β) and gamma (γ) radiation. Knowledge of the term ‘ionisation’ and the effect of ionisation on neutral atoms. Knowledge of the relative ionising effect and penetration of alpha, beta and gamma radiation. Definition of activity in terms of the number of nuclear disintegrations and time. Use of an appropriate relationship to solve problems involving activity, number of nuclear disintegrations and time. $A = \frac{N}{t}$ Knowledge of sources of background radiation. Knowledge of the dangers of ionising radiation to living cells and of the need to measure exposure to radiation. Use of appropriate relationships to solve problems involving absorbed dose, equivalent dose, energy, mass and weighting factor. $D = \frac{E}{m}$ $H = Dw_r$ Use of an appropriate relationship to solve problems involving equivalent dose rate, equivalent dose and time. $\dot{H} = \frac{H}{t}$ Comparison of equivalent dose due to a variety of natural and artificial sources. Knowledge of equivalent dose rate and exposure safety limits for the public and for workers in the radiation industries in terms of annual effective equivalent dose. ♦ Average annual background radiation in UK: 2·2 mSv. ♦ Annual effective dose limit for member of the public: 1 mSv. ♦ Annual effective dose limit for radiation worker: 20 mSv. Awareness of applications of nuclear radiation: electricity generation, cancer treatment and other industrial and medical uses. Definition of half-life. Use of graphical or numerical data to determine the half-life of a radioactive material. Description of an experiment to measure the half-life of a radioactive material. Qualitative description of fission, chain reactions, and their role in the generation of energy. Qualitative description of fusion, plasma containment, and their role in the generation of energy.
Units, prefixes and scientific notation
Use of appropriate SI units and the prefixes nano (n), micro (μ), milli (m), kilo (k), mega (M), giga (G). 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 least number of significant figures used in the calculation. Appropriate use of scientific notation.

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 (www.scqf.org.uk).

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:

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

These skills must be built into the course where there are appropriate opportunities and the level should be appropriate to the level of the course.

Further information on building in skills for learning, skills for life and skills for work is given in the course support notes.

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
- apply 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 two components, a question paper and an assignment. The relationship between these two components is complementary, to ensure full coverage of the knowledge and skills of the course.

Course assessment structure: question paper

Question paper 135 marks

The purpose of the question paper is to assess breadth, challenge and application of skills, knowledge and understanding from across the course.

The question paper also assesses scientific inquiry skills and analytical thinking skills.

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

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

The question paper has a total of 135 marks and contributes 80% of the overall marks for external assessment.

The question paper has two sections:

- Section 1 (objective test) has 25 marks.
- Section 2 contains restricted and extended response questions and has 110 marks. This is scaled to 75 marks.

The majority of marks are awarded for demonstrating and applying knowledge and understanding. The other marks are awarded for applying scientific inquiry and analytical thinking skills.

A data sheet containing relevant data and a relationships sheet are provided.

Setting, conducting and marking the question paper

The question paper is set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA. The question paper is 2 hours and 30 minutes in duration.

Specimen question papers for National 5 courses are published on SQA's website. These illustrate the standard, structure and requirements of the question papers candidates sit. The specimen papers also include marking instructions.

Course assessment structure: assignment

Assignment 20 marks

The purpose of the assignment is to assess the application of skills of scientific inquiry and related physics knowledge and understanding.

This component allows assessment of skills which cannot be assessed through the question paper, for example the handling and processing of data gathered as a result of experimental and research skills.

Assignment overview

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

- applying knowledge of physics to new situations, interpreting information and solving problems
- planning, designing and safely carrying out experiments/practical investigations to test given hypotheses or to illustrate particular effects
- selecting information from a variety of sources
- presenting information appropriately in a variety of forms
- processing the information (using calculations and units, where appropriate)
- making predictions based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- suggesting improvements to experiments/practical investigations
- communicating findings/information

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

- unfamiliar
- familiar but investigated in greater depth
- familiar but integrates a number of concepts

Candidates will research and report on a topic that allows them to apply skills and knowledge in physics at a level appropriate to National 5.

The topic should be chosen with guidance from the teacher/lecturer and must involve experimental work.

The assignment has two stages:

- research
- report

The research stage must involve an experiment which allows measurements to be made. Candidates must also gather data from the internet, books or journals to compare against their experimental results.

Candidates must produce a report on their research.

Setting, conducting and marking the assignment

Setting

The assignment is:

- set by centres within SQA 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 National 5

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 below gives details of the mark allocation for each section of the report.

Section	Expected response	Max marks
Title	The report has an informative title.	1
Aim	A description of the purpose of the investigation.	1
Underlying physics relevant to the aim	A description of the physics relevant to the aim which shows understanding.	3
Data collection and handling	A brief description of the experiment.	1
	Sufficient raw data from the experiment.	1
	Raw data presented in a table with headings and units.	1
	Values correctly calculated from the raw data.	1
	Data from an internet/literature source.	1
	A reference for the internet/literature source.	1
Graphical presentation	The correct type of graph used to present the experimental data.	1
	Suitable scales.	1
	Suitable labels and units on axes.	1
	All points plotted accurately, with line or curve of best fit if appropriate.	1
Analysis	Experimental data compared to data from internet/literature source.	1
Conclusion	A conclusion related to the aim and supported by data in the report.	1
Evaluation	A discussion of a factor affecting the reliability, accuracy or precision of the results.	2
Structure	A report which can be easily followed.	1
		20

The report is submitted to SQA for external marking.

All marking is quality assured by SQA.

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 SQA 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. This includes a maximum of 1 hour and 30 minutes which is allocated to the reporting 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/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 within the assignment assessment task.

In the research stage:

- teachers/lecturers must agree the choice of topic with the candidate
- teachers/lecturers must provide advice on the suitability of the candidate's aim
- teachers/lecturers can supply instructions for the experimental procedure
- candidates must undertake research using only websites, journals and/or books, to find secondary data/information
- a wide list of URLs and/or a wide range of books and journals may be provided

Teachers/lecturers **must not**:

- provide an aim
- provide candidates with a set of experimental data for the candidate's experiment
- provide candidates with a set of experimental data to compare with the candidate's own data
- provide a blank or pre-populated table for experimental results

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

- the instructions for candidates
- the candidate's raw experimental data
- the internet or literature data (including a record of the source of the data)
- information on the underlying physics
- the experimental method, if appropriate

Candidates **must not** have access to a previously prepared:

- draft of a report
- draft of a description of the underlying physics
- specimen calculation or set of calculations for mean or derived values
- graph
- comparison of data
- conclusion
- evaluation of an experimental procedure

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

Reasonable assistance

Candidates must undertake the assessment independently. However, reasonable assistance may be provided prior to the formal assessment process taking place. The term 'reasonable assistance' is used to try to balance the need for support with the need to avoid giving too much assistance. If any candidates require more than what is deemed to be 'reasonable assistance', they may not be ready for assessment or it may be that they have been entered for the wrong level of qualification.

The assignment assessment task provides guidance on reasonable assistance.

Evidence to be gathered

The following candidate evidence is required for this assessment:

- a report

The report is submitted to SQA, within a given time frame, for marking.

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

Volume

There is no word count.

Grading

A candidate's overall grade is 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 with no unnecessary barriers to learning or assessment.

For guidance on assessment arrangements for disabled candidates and/or those with additional support needs, please follow the link to the assessment arrangements web page: www.sqa.org.uk/assessmentarrangements.

Further information

The following reference documents provide useful information and background.

- National 5 Physics subject page
- Assessment arrangements web page
- Building the Curriculum 3–5
- Design Principles for National Courses
- Guide to Assessment
- SCQF Framework and SCQF level descriptors
- SCQF Handbook
- SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work
- Coursework Authenticity: A Guide for Teachers and Lecturers
- Educational Research Reports
- SQA Guidelines on e-assessment for Schools
- SQA e-assessment web page

Administrative information

Published: April 2017 (version 1.0)

History of changes to course specification

Version	Description of change	Authorised by	Date

Note: You are advised to check SQA's website to ensure you are using the most up-to-date version of the course specification.