National Qualifications

Physics
Assignment
General assessment information

This pack contains general assessment information for centres preparing candidates for the assignment Component of National 5 Physics Course assessment.

It must be read in conjunction with the specific assessment task for this Component of Course assessment, which may only be downloaded from SQA's designated secure website by authorised personnel.

This edition: September 2016 (version 1.3)

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Introduction

This is the general assessment information for National 5 Physics assignment.

This assignment is worth 20 marks out of the total of 100 marks available for this Course. The marks contribute 20% of the overall marks for the Course assessment.

This is one of two Components of Course assessment. The other Component is a question paper.

Marks for all Course Components are added up to give a total Course assessment mark which is then used as the basis for grading decisions. The Course will be graded A–D.

The assessment task will be set and externally marked by SQA and conducted in centres under the conditions specified by SQA.

This document describes the general requirements for the assessment of the assignment Component for this Course. It gives general information and instructions for assessors.

It must be read in conjunction with the assessment task for this Component of Course assessment.

Equality and inclusion

This Course assessment has been designed to ensure that there are no unnecessary barriers to assessment. Assessments have been designed to promote equal opportunities while maintaining the integrity of the qualification.

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/sqa/14977.html

Guidance on inclusive approaches to delivery and assessment in this Course is provided in the *Course Support Notes*.

What this assessment covers

This assessment contributes 20% of the total marks for the Course.

The assessment will assess the skills, knowledge and understanding specified for the assignment in the *Course Assessment Specification*. These are:

- applying knowledge of physics to new situations and interpreting information
- selecting information and presenting information appropriately in a variety of forms
- processing the information (using calculations and units, where appropriate)
- drawing valid conclusions and giving explanations supported by evidence/justification
- communicating findings/information

Assessment

Purpose

The purpose of this assessment is to generate evidence for the added value of this Course by means of an assignment.

Assessment overview

Assessment should take place when the candidates are ready to be assessed.

This assignment requires candidates to apply skills, knowledge and understanding to investigate a relevant topic in physics and its effect on the environment and/or society. The effect may be positive and/or negative. The topic should draw on one or more of the key areas of the Course, and should be chosen with guidance from the assessor.

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
- integrates a number of familiar contexts

This assignment has two stages:

- a research stage
- a communication stage

The **research** stage involves gathering information/data from the internet, books, newspapers, journals, experiment/practical activity or any other appropriate source. Candidates must select, use and record at least two referenced sources. An appropriate experiment/practical activity may be used as one of the data sources. Any practical work undertaken will not be assessed.

Candidates may work individually or in small groups as part of the **research** stage when gathering information/data or undertaking an experiment/practical activity, but assessors much ensure that candidates are able individually to meet the evidence requirements of this assessment.

In the course of their assignment, candidates are required to:

- choose, with support, a relevant topic in physics that has an effect on the environment and/or society
- devise an appropriate aim
- describe the relevant application(s) of physics and explain the effect on the environment/society
- research the topic by selecting, processing and presenting relevant data/information

- draw a conclusion
- describe underpinning physics knowledge and understanding and explain its relevance to the topic researched
- communicate the findings of the research in a report

Further information on suggested investigations can be found in the National 5 Physics *Course and Unit Support Notes*. None of these suggested investigations are mandatory. A resource pack for one possible context for this assignment is also included in the *Course and Unit Support Notes*. Assessors and candidates should choose relevant topical contexts appropriate to the learning and teaching.

Assessment conditions

Assessors must exercise their professional responsibility in ensuring that evidence submitted by a candidate is the candidate's own work.

Candidates should start the assignment at an appropriate point in the Course. This will normally be when they have started work on the Units in the course and have sufficient knowledge and skills to undertake the assignment. It is recommended that no more than eight hours is spent on the whole assignment.

This assignment has two stages:

- a research stage
- a communication stage

Candidates may produce their report over a period of time. If the report is done over a number of sessions, then the assessor must retain the candidate's work between sessions. Following completion of the report there should be **no** redrafting.

As a guide, evidence which meets the requirements of this Component of Course assessment should be 500-800 words, excluding tables, charts and diagrams.

Candidates may access any appropriate resources during the research stage of this assignment.

When the assignment includes an experiment/practical activity, the assessor should supply instructions for the experimental procedures.

During the **communication** stage of this assignment, candidates should have access to the following resources:

- Material collected by the candidate during the **research** stage. This may include, for example, statistical, graphical, numerical or experimental data; data/information from the internet; published articles or extracts; notes taken from a visit or talk; notes taken from a written or audio-visual source.

The assessor should check that the material used by the candidate in this communication stage conforms to the criteria above. It must not include a prepared report.

The requirements of the assignment should be made clear to candidates at the outset.

Reasonable assistance may be provided prior to the formal assessment process taking place. Reasonable assistance may be given on a generic basis to a class or group of candidates.

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.

In the **research** stage, reasonable assistance may include:

- directing candidates to the Instructions for Candidates
- clarifying instructions/requirements of the task
- advising candidates on the choice of the topic or issue

In the **communication** stage, reasonable assistance may include:

- directing candidates to the Instructions for Candidates
- clarifying instructions/requirements of the task

At any stage, reasonable assistance may **not** include:

- providing model answers
- providing feedback on drafts

The **research** stage will be conducted under some supervision and control. This means that although candidates may carry out some research outwith the learning and teaching setting, assessors should put in place processes for monitoring progress and ensuring that the work is the candidate’s own and that plagiarism has not taken place.

Assessors should put in place mechanisms to authenticate that the research is the candidate’s own work. For example:

- regular checkpoint/progress meetings with candidates
- short spot-check personal interviews
- checklists which record activity/progress
- photographs, film or audio evidence
- checking candidate lab books/blogs

Candidates may work individually or in small groups as part of the **research** stage. However, there must be clear evidence for each candidate to show that the candidate has met the evidence requirements.

The **communication** stage will be conducted under a high degree of supervision. This means that:

- candidates must be in direct sight of the assessor (or other responsible person) during the period of the assessment
- candidates must not discuss their work with each other

Evidence to be gathered

The following candidate evidence is required for this assessment:

- a report

The report will be submitted to SQA, within a given time frame, for marking. The same report cannot be submitted for more than one subject.

Marking Instructions

General marking principles for National 5 Physics assignment

This information is provided to help understanding of the general principles that will be applied when marking candidate responses in this assignment. These principles must be read in conjunction with the detailed Marking Instructions that will be used to mark the assignment.

- Marks for each candidate response will always be assigned in line with these general marking principles and the detailed Marking Instructions.
- Marking should always be positive, ie marks should be awarded for what is correct and not deducted for errors or omissions.
- Principal Assessors will provide guidance on marking specific candidate responses which are not covered by either the principles or detailed Marking Instructions.

Total marks available	20
Skills	14
Knowledge and understanding	6

Detailed Marking Instructions

These detailed Marking Instructions provide the basis on which the general marking principles should be applied.

Read the whole report before assigning any marks. Credit should be given for appropriate information **wherever** it is given in the report, regardless of the subheadings.

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
1	Devise an appropriate aim for an investigation	States an appropriate aim	1	The aim must describe clearly what is to be investigated	The word 'aim' does not need to be stated. An appropriate title could encompass the aim. Acceptable versions of an aim could be: 'the effect of seatbelts on reducing injuries' or 'to investigate the use of seatbelts'. NOTE: 'seatbelts' alone or 'car safety features' or 'to investigate seatbelts' or to 'investigate car safety features' would not be acceptable.
2	Describe an application of physics and explain its effect on the environment/society	Describes the application	2	**1 mark** for providing a statement of characteristics and/or features of the application **1 mark** for making clear the	**Application (section 2a mark)** Not enough just to state the application, eg 'seatbelts are used in cars' — must describe the application, eg 'seatbelts apply a restraining force'. (It's the 'how it does it'.)

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
		Explains the effect on the environment/ society		relationship between the application and its effect on the environment/society	**Effect (section 2b mark)** eg 'Seatbelts are used in cars to save lives'. Effect on environment/society can be positive or negative (or both). Effect on society may include groups within society (eg astronauts).
3	Select relevant sources	Explanation of reasons for selection of at least two sources	2	**2 marks** for explanations of the choice of sources on the basis of the following reasons: ♦ relevance ♦ reliability of sources ♦ similar/different perspectives **1 mark** for each explanation of the choice of sources on the basis of **one** of the above reasons	**There must be at least two different sources. If only one source is given, even with explanation(s) — 0 marks.** Data/information is from the same domain/book/journal etc (eg www.bbc.co.uk/education and www.bbc.co.uk/news) should be considered as the same source. Two experiments/practical activities carried out by the same candidate should be considered as one source. The terms relevant, reliable or perspective **do not** need to be stated, but the explanation must be correct (eg 'the NHTSA website is reputable because it is a government website').

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
					Two explanations could be given for one of the sources. Two explanations could be given for the same reason. The candidate must **explain** why they chose the sources — for example, not just 'source 1 is relevant' or 'source 2 is reliable'; it must be 'source 1 is relevant because…'. 'Source 1 is relevant to my aim' is insufficient as it does not explain why it is relevant. 'Source 1 is relevant because it has data about lives saved due to seatbelts' is acceptable. For sources identified **at this stage** (websites, books, journals, etc), to access these marks the candidate does not have to give details to allow retrieval of the source: eg 'source 1 is the IoP website' with suitable explanation would be acceptable. An answer such as 'the resource pack/notes is reliable as it was **given to me** by my teacher' is **not** acceptable.

<table>
<tr><th></th><th>Skills, knowledge and understanding</th><th>Expected response</th><th>Max mark</th><th>Additional guidance</th><th>Notes to Markers</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
Answers such as ‘it is reliable as it was written by my physics teacher(s)/published book’ are acceptable.

If a candidate explains why the sources have similar/different perspectives it must be clear what aspect of the content of the sources is similar/different.

‘I chose these two sources because they provide similar information about seatbelts’ is not acceptable.

‘I chose these two sources because they provide similar information about lives saved by seatbelts’ is acceptable.

<table>
<tr><th>Number of sources</th><th>Number of correct explanations</th><th>Number of marks</th></tr>
<tr><td>2</td><td>2 (different for each source)</td><td>2</td></tr>
<tr><td>2</td><td>2 (same for each source)</td><td>2</td></tr>
<tr><td>2</td><td>2 (different for same source)</td><td>2</td></tr>
<tr><td>2</td><td>1</td><td>1 or 2*</td></tr>
<tr><td>1</td><td>0/1/2</td><td>0</td></tr>
<tr><td>0</td><td>0/1/2</td><td>0</td></tr>
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	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
					*Note: Where a candidate states 'both sources are ...' or 'source 1 and source 2 are...', a mark should be awarded for each of the sources for which the explanation is correct.
4	Select relevant Information from sources	Selects relevant data/information for inclusion in the report	2	**2 marks** for inclusion in the report of relevant data/information selected from two or more sources This could include raw data from an experiment/practical activity, extracted tables, graphs, diagrams or text	**Data/information must be relevant.** **If no sources are identified anywhere in the report then these marks cannot be accessed.** **If raw data/information is not included — award 0 marks.** Raw data from an experimental/practical activity is the actual measurements taken by the candidate(s). For example, in an experiment to determine resistance, the current and voltage are the raw data. Calculation of the resistance would contribute towards the marks for processing. If a candidate takes raw data from a source and processes it, without including the original raw data, and then claims that this processed data is their raw data then award **0 marks** for this source.

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<tr><th></th><th>Skills, knowledge and understanding</th><th>Expected response</th><th>Max mark</th><th>Additional guidance</th><th>Notes to Markers</th></tr>
<tr><td></td><td></td><td></td><td></td><td>1 mark for relevant data/information selected from only one source</td><td>Two pieces of relevant data/information from two sources (the sources can be identified anywhere in the report, eg in the explanation for selection of relevant sources or in the references or referenced next to the data/information) — 2 marks.

Two pieces of relevant data/information from only one source (only one source is identified throughout the whole report or candidate states both pieces of data come from one source) —
1 mark.

One piece of data/information from one identified source — 1 mark.

Two experiments/practical activities carried out by the same candidate should be considered as one source.

<table>
<tr><th>Data/ information</th><th>No of sources</th><th>No of marks</th></tr>
<tr><td>2</td><td>2</td><td>2</td></tr>
<tr><td>2</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td></tr>
<tr><td>2</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td></tr>
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</td></tr>
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	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
5	Process and present data/information	Processes information from at least two sources by summarising, performing calculations or re-arranging in appropriate format The presentation of this processed data/information must include at least one from graph, table, chart or diagram, and be presented correctly with all appropriate labelling Compares data/information from at least two sources	6	**2 marks** for processing raw data/information or extracted data/information from at least two sources **(section 5a marks)** Processing can include performing calculations, plotting graphs from tables, populating tables from other sources, summarising referenced text —although the marks are awarded for processing, it must be clear where the raw or extracted data/information came from **1 mark** for processing from **only one** source **(section 5a mark)**. **2 marks** for presenting processed data/information in appropriate format(s) from: summary, calculation, graph, table, chart or diagram (one must be graph, table, chart or diagram). In each case, sufficient detail should be included to convey the	**Source 1:** **1 mark** for choosing an appropriate presentation format for the processed data **(section 5b mark).** For a mark to be awarded for presenting by calculation at least one sample calculation must be presented in a logical and coherent manner **(section 5b mark).** In Physics, the calculation of a mean would not, on its own, be evidence of presenting or processing at National 5 level. **1 mark** for the accuracy of processing the raw data **(section 5a mark)**, eg correct calculations, suitable scales, points plotted accurately on line graphs (usual tolerance of plus/minus ½ division for graph paper) with a best fit line (or other appropriate line), bars plotted accurately on bar graphs, (usual tolerance of plus/minus ½ division), pie charts drawn (to usual tolerance of plus/minus 2 degrees) values entered into tables correctly. Almost all (≥90%) processing must be correct (ie calculations, points, bars, sectors). For example, five calculated values and then these five values plotted equates to ten

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
				data/information **(section 5b marks)** **1 mark** for presenting processed data/information only once **(section 5b mark)**	items of processing. If the candidate has not used graph paper to draw a graph or chart the marker must be confident of the accuracy to access the processing marks. No ½ box tolerance if candidate has not used graph paper. If the presentation format is a summary which contains numerical values extracted from a source, then these values must have correct units included, where appropriate, to be considered accurate **(section 5a mark)**. A summary should be more than a generalisation or conclusion for it to be awarded the mark for accurate processing **(section 5a mark)**, eg 'as x increases y decreases' is insufficient. **Source 2 (a different source):** **1 mark** for choosing an appropriate

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
					presentation format for the data **(section 5b mark)**. This may be the same format as for Source 1, provided it is a graph, table, chart or diagram. **1 mark** for the accuracy of processing the raw data **(section 5a mark)**. If **no raw data** was included from the sources then the marks for processing **cannot** be accessed **(section 5a marks).** If the raw data is not included, the marks for presenting **(section 5b marks)** and comparison of data **(section 5d mark)** can still be awarded. If more than one format has been presented for **one** of the sources then mark **all** and award the best mark for that source. If the candidate has processed and presented from **more than two** sources, mark all and award marks for the combination that achieves the highest mark overall. **All** appropriate units, headings and labels for all graphs, tables, charts or diagrams awarded marks in sections 5a and 5b must be

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
					included. If there is no graph, table, chart or diagram this mark cannot be awarded **(section 5c mark)**.
				1 further mark for complete labelling of the graphs, tables, charts or diagrams **(section 5c mark)**	The label and units mark would be applied for the two formats chosen to give the candidate the best mark **(section 5c mark).**
				1 mark for a comparison of data/information from at least two sources **(section 5d mark)**	The comparison mark **(section 5d mark)** is independent of the marks allocated in sections 5a, 5b and 5c. If the two sources cannot be compared then a statement must be given to this effect. The comparison must be between at least any two pieces of raw/processed data/information from **different** sources. The comparison must be valid for the data/information in the report.

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
6	Draw a valid conclusion	States a valid conclusion	1	**1 mark** for drawing a conclusion that relates to the aim and is supported by evidence from the candidate's research	Conclusion must relate to aim. If the candidate states multiple aims then conclusion must relate to all aims given (unless the candidate stated that the aim was modified to narrow the focus). Although the conclusion may relate to the aim it must be supported by evidence/information in their report, otherwise the conclusion mark cannot be accessed.
7	Apply knowledge and understanding of physics	Explains the underlying physics as it relates to the topic	3	Maximum of **3 marks** for an explanation of the underlying physics The response might include a statement of the principles involved and include, for example, the laws of physics and/or relationships with quantities defined. The candidate must use physics terms/ideas at a depth appropriate to National 5 Physics **3 marks** should be awarded to candidates who demonstrate a good understanding of the	If the underlying physics has been copied verbatim from a reference or website then the candidate is not demonstrating understanding and should be awarded **0 marks**. Information which is quoted from references in this section and then explained or expanded upon by the candidate is acceptable. If any of the candidate's explanation of the underlying physics has been given credit elsewhere in the report (eg in section 2a, for the application), then that piece of information should not be considered when awarding marks for the underlying physics.

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
				physics involved (this does not mean the answer has to be 'excellent' or 'complete'). This means that the candidate: ♦ shows a comprehension of the physics of the situation by providing a logically correct explanation of the physics involved ♦ uses physics terms/ideas which are mostly at a depth appropriate to National 5 Physics and are mostly correct **2 marks** should be awarded to candidates who demonstrate a reasonable understanding of the physics involved. This means that the candidate: ♦ makes some statement(s) which is/are relevant to the situation, showing that they understand the underlying physics ♦ uses physics terms/ideas, some of which are at a depth appropriate to	

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
				National 5 Physics, most of which are correct **1 mark** should be awarded to candidates who demonstrate a limited understanding of the physics involved. This means that the candidate: ♦ has made some statement(s) which is/are relevant to the situation, showing that they understand at least a little of the underlying physics (although some of the physics given might be incomplete, wrong or contradictory) ♦ uses physics terms/ideas which are mostly not at a depth appropriate to National 5 Physics, or mostly incorrect	

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
8	Structure of the report	Report has an appropriate structure At least two relevant sources of information/data are recorded appropriately Report is clear and concise	3	Maximum of **3 marks** for the structure of the report. **1 mark** for each of: ♦ appropriate and informative title **(section 8a mark)** ♦ at least two references to the sources used in the report should be given in sufficient detail to allow them to be retrieved by a third party. There is no need to follow a formal referencing system. If one of the sources is an experiment/practical activity, then the title, aim and raw data should be recorded **(section 8b mark)** ♦ report is clear and concise **(section 8c mark)**	The structure of the report does not need to follow the structure listed in the Marking Instructions or Instructions for candidates. An appropriate title could encompass the aim. If one of the sources is the candidate's own experiment/practical activity, then **only** the title and aim are required as raw data has been dealt with elsewhere. The candidate may have more than two sources, but only two of these sources must have sufficient detail to allow them to be retrieved by a third party. Sources may be identified anywhere in the report (ie any two, anywhere). References of websites must have the complete URL address (or short URL). 'Wikipedia'/search engine/homepage/'bbc' etc are **not** acceptable. References of text books must include title, author, page number and either ISBN number or version/edition number. References of journals must include title, author, volume and page number. At least two references must be given

	Skills, knowledge and understanding	Expected response	Max mark	Additional guidance	Notes to Markers
					correctly to access this mark. If more than one URL from the same domain is referenced (eg www.bbc.co.uk/education and www.bbc.co.uk/news) then these should be considered as one reference.

Administrative information

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History of changes

Version	Description of change	Authorised by	Date
1.1	Detailed Marking Instructions updated.	Qualifications Manager	September 2014
1.2	Detailed Marking Instructions updated to further clarify Marking Instructions	Qualifications Manager	September 2015
1.3	Detailed Marking Instructions updated to further clarify Marking Instructions.	Qualifications Manager	September 2016

Security and confidentiality

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