



NQ Verification 2016–17

Key Messages Round 2

01

Section 1: Verification group information

Verification group name:	Physics
Verification event/visiting information	Event and visiting
Date published:	June 2017

National Courses/Units verified:

H25C 74 National 4 Physics Assignment (Added Value Unit)
H4L1 76 Higher Researching Physics
H7XG 77 Advanced Higher Investigating Physics

02

Section 2: Comments on assessment

Assessment approaches

For National 4, the evidence produced should relate to a key area from the Physics course. The candidates can use a range of formats to present the relevant information but it is advised that they follow the structure as described in the advice provided within the unit assessment support pack. It is also important that the investigation topic selected to achieve this unit should be at the appropriate level for the course and allow the relevant physics knowledge to be demonstrated.

Centres should ensure that they are making use of the most recent unit assessment support pack and the revised marking criteria for the National 4 added value unit published in October 2016.

To aid both internal and external verification processes, it is advised that candidate evidence is clearly marked, showing the point at which the mark is being awarded.

Assessment standard 1.1 should be at National 4 level and link to a key area of the whole course being studied. It is also important that the candidate can demonstrate both an understanding of the physics being used and the impact the topic has on society and/or the environment.

For assessment standard 1.2, the candidate must select information from at least two sources of information/data during the research phase of the activity. The candidate can use two sources from relevant internet or literature sources or can carry out an experiment as one of the sources. If an experiment is selected then this would require a title and aim to allow it to be included in the reference section of the report.

If the candidate is not including all the relevant research data in the final communication, the centre should include the candidate's log book as part of the candidate evidence in the verification sample. This will also allow the verification of assessment standard 1.3, as the candidates must present information in another format.

Assessment standard 1.4 requires the candidates to demonstrate an understanding of the physics involved and link this knowledge to the impact it has on the environment or society. This impact can be either positive or negative but must be backed up with physics knowledge.

Assessment standard 1.5 is the communication phase of the added value unit where the candidate brings together the findings/relevant information into one document/presentation. This must have a clear aim and an overall conclusion. All centres selected this year used the standard scientific report using the new marking criteria published in the document *National 4 Physics: Understanding the next steps for session 2016–17*.

For Higher, the evidence for the Higher Researching Physics unit is assessed over two outcomes with the first being based around the research carried out by the candidate. This research demonstrates the candidates' skills of scientific inquiry and draws on their knowledge and understanding of physics principles. The second outcome has two assessment standards, showing that the candidate can plan/design a practical experiment to support the research and then carry out the practical work taking relevant measurements.

Assessment standard 1.1 requires the candidate to gather and record evidence from at least two relevant sources which demonstrates the candidate's knowledge of physics at Higher level.

Assessment standard 2.1 gives the candidate the opportunity to demonstrate their design skills in a science laboratory situation. They are required to clarify what they will be investigating and then design a relevant experimental procedure for the topic being researched.

For assessment standard 2.2, the experimental technique might be altered due to the apparatus available but the candidate must safely obtain observations/measurements and record these in the most appropriate format.

For Advanced Higher, the evidence for the Advanced Higher Investigating Physics unit is assessed with one outcome containing three assessment standards. For assessment standard 1.1 the candidate must give a clear statement of the physics involved in their investigation including the details of a

minimum of three sources they have used. These sources should be given in enough detail to allow a third party to check the details.

Assessment standard 1.2 is based around the selection/design of the experimental evidence they will collect during the investigation. The description of the method(s) must be detailed enough for another competent AH candidate to follow, including what is to be measured and how these measurements will be made.

For assessment standard 1.3, the candidate must be observed carrying out the experimental techniques safely. They must also collect and record the experimental observations/measurements in an appropriate format. This should result in precise and accurate measurements being taken throughout the experimental stage of the investigation.

All centres visited this year for both Higher and Advanced Higher selected appropriate experimental techniques.

Assessment judgements

For National 4, it was clear from the evidence supplied this year from the centres selected that the staff and candidates had a much better understanding of the national standard and most of the centres used the up to date assessment criteria. This resulted in clearer evidence demonstrating where the marks had been allocated.

None of the centres selected this year supplied the log book with the final report making it difficult to fully assess the attainment of assessment standard 1.1 and 1.3. However, the candidates did supply the raw data within their reports.

For Higher, assessment standard 1.1 requires the candidates to make a clear statement at the beginning of the research stage describing the topic selected. This statement must include Higher level physics knowledge showing a clear understanding of the topic selected. Most candidates did not supply the overall statement covering the topic selected but the underlying physics was clearly available for this assessment standard.

Assessment standard 2.1 was carried out using small groups to design the practical/experimental setup. In some cases, the design was altered due to the apparatus available in the centre but this was fully explained in the day books sampled.

Assessment standard 2.2 requires that the candidates record measurements in the most appropriate format(s). Most candidates produced clear tables for the results but some candidates omitted the headings and units for some of columns in the tables.

For Advanced Higher, centres supplied mostly interim evidence for visiting verification of Investigating Physics (Advanced Higher). Centres are reminded

that no group work is allowed in Advanced Higher for the Investigating Physics unit or the project.

For assessment standard 1.1, the candidates verified had started to note the physics involved in their investigations but this was frequently below the level required for Advanced Higher. Most had a clear statement of the topic being investigated.

For assessment standard 1.2, the candidate must plan and design their investigation including a clear aim for the practical activity to be completed. This could be for multiple procedures (typically three or four at Advanced Higher) but it is important that this stage is a solo activity and no group work is allowed. The information supplied should be detailed enough, including measurements to be taken and any risks associated with the procedure, to allow another competent AH candidate to be able to carry out the practical/experimental stage. Candidates must choose and plan their own investigation (allowing for potential issues with supply of equipment).

Assessment standard 1.3 is the completion of the practical work and again must be carried out individually. The candidate must collect relevant data and record this in the most appropriate format; this should include repeated measurements, where appropriate, and calculated averages, along with all associated uncertainties. At this stage it is not necessary to include a full analysis of the uncertainties as this will be included in the project report.

All of the centres selected for visiting verification used an appropriate log book or 'daybook' to record the candidates' findings.

03

Section 3: General comments

For National 4, centres should ensure that they are making use of the most recent unit assessment support packs and the revised marking criteria for the National 4 added value unit published in October 2016. It is fine to select any topic as long as it is at the appropriate National 4 level.

If the candidate supplies a response that does not cover all of the evidence requirements for the unit, it is appropriate to ask them to redraft and then assess using the new assessment criteria.

For example, if the candidate had a table of results with missing units in the headings, the centre staff could ask them to check the tables for their data. This would constitute a re-assessment opportunity. Giving the candidate advice on what units they should include in a table is inappropriate.

It is important that the level of support given to the candidates does not go above that described in the unit assessment support pack. Some centres have devised log books that cover the required level but a few supplied suggested answers to some of the areas required for achievement of the assessment standard, which was inappropriate.

For Higher Physics, centres are reminded that evidence of candidates achieving the Researching Physics unit can be used as evidence of achieving outcome 1 in the other units, without the need to match evidence.

For Advanced Higher, centres are reminded that evidence of candidates achieving the Investigating Physics unit (Advanced Higher) can be used as evidence of candidates achieving outcome 1 for the other units, without the need to match evidence.

Centres are reminded that Advanced Higher candidates should be making their **own choice** of investigation topic and unless a centre is presenting a large number of candidates there is no reason why multiple candidates should be investigating the same thing. For example, there should be no instances of a class of candidates, whether this be a class of two or three or even a class of seven or eight, all investigating acceleration due to gravity (possibly by the same three or four methods), as this would not allow candidates to successfully achieve the assessment standards of the unit and therefore they would be unable to achieve a course award. It may also result in the centre being referred for suspected malpractice. At AH level, it would never be appropriate to set up a 'circus' of three or four methods of measuring a quantity, eg acceleration due to gravity, for all candidates to work round as there would then be no evidence of planning for any of the candidates.

Where university facilities are being used, it is important that candidates carry out their planning and designing of the investigation in advance of using the university facilities. They should not be arriving at the university to then be given a topic to investigate, as there would then be no evidence of planning.

Where centres do have a large uptake of Advanced Higher, it may be that they have to have two or three candidates investigating the same topic. In this case it may be possible to vary the methods used and the teacher/lecturer needs to stress to the candidates that they must not discuss their work with each other to avoid any potential collusion and accusations of malpractice. Before resulting the unit, the teacher/lecturer must ensure that it is clear from the evidence submitted by each candidate that collusion has not taken place.

It is important that centres have an effective internal verification process that allows the standards applied to be the same, not just within one teaching group but across teaching groups. A number of centres have developed a clear internal verification process that is applied across the other three units but not always with the Researching Physics or the Investigating Physics units.

When a centre is selected for verification evidence it is important that the centre includes verified evidence for some candidates to demonstrate the effective use of the centre policy. Centres are required to include a copy of the policy so it is important to allow this to be checked.