



# NQ Verification 2017–18 Key Messages Round 2

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## Section 1: Verification group information

Verification group name:	Physics
Verification event/visiting information	Event and Visiting
Date published:	May 2018

### National Courses/Units verified:

H25C74	Physics Assignment (National 4) Added Value Unit
H4L1 76	Researching Physics (Higher)
H7XG 77	Investigating Physics (Advanced Higher)

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## Section 2: Comments on assessment

### Assessment approaches

#### Physics Assignment (National 4) Added Value Unit

The National 4 Added Value Unit should be based at the required level and linked to a key area of the Physics course. Data may be presented in various ways, but where candidates are presenting their research in report form, centres are advised to follow the report structure outlined in the unit assessment support pack. 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.

When centre staff mark candidate evidence, they should indicate clearly where marks are being allocated for each assessment standard. This would aid both the internal and external verification process.

Assessment standard 1.1 should be at National 4 level and link to a key area of the whole course being studied. Candidates should state clearly what they are investigating and describe its impact on society/the environment.

For assessment standard 1.2 candidates must select information from at least two sources of information/data during the research phase of the activity. Candidates can use two sources from internet/literature research or carry out an experiment as one of the sources. If an experiment is selected, this will require a title and aim to allow it to be included in the reference section of the report. All raw data should be available if candidates have processed it in any way, to allow the verification process to be effective. This could be in the final report/presentation or in the candidate's log book, which should be included in the final presentation.

Assessment standard 1.4 requires candidates to demonstrate an understanding of physics theory, and its impact 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 where candidates bring all relevant information/findings into a final document/presentation. This must have a clear aim and an overall conclusion.

Most centres selected this year used the standard scientific report, with a few using the conference poster layout. All centres assessed the added value unit using the new marking criteria published in [National 4 Physics: Understanding the next steps for session 2016-17](#).

### **Researching Physics (Higher)**

The Higher Researching Physics unit is assessed over two outcomes for which evidence is collected. The first outcome is based around the research carried out by candidates and must demonstrate the candidates' scientific enquiry skills. It must also draw on their knowledge and understanding of physics principles. The second outcome is split into two assessment standards so that candidates can plan/design a practical experimental procedure to support their research and then carry out the practical work, taking relevant measurements.

Assessment standard 1.1 requires candidates to gather and record evidence, from at least two relevant sources, which demonstrates the individuals' knowledge of physics at Higher level. This can include a practical experiment as a source but to count this as a reference then a title and aim must be included. Assessment standard 2.1 requires candidates to develop their design skills in a science laboratory situation. The candidate must clarify what they will be investigating and then design a relevant experimental procedure that would allow them to demonstrate the situation being researched.

Assessment standard 2.2 is the collecting evidence stage and may require the experimental procedure to be altered due to the apparatus available. Candidates must safely obtain measurements and record these in the most appropriate format.

## **Investigating Physics (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 candidates are required to give a clear statement of the physics involved in their investigation, while supplying three relevant sources for the knowledge they will be including. The sources should be recorded in enough detail to allow a third party to check the details without having to search for the information.

Assessment standard 1.2 is the selecting/design stage of the investigation and is where candidates explain how they will collect the experimental evidence during the investigation. It must be detailed enough to show what is to be measured and how these measurements will be carried out.

For assessment standard 1.3 the candidate must be observed carrying out the experimental procedures. They are also required to collect and record experimental measurements in an appropriate format, including appropriate headings and units. This should result in precise and accurate measurements being taken throughout the experimental stage of the investigation.

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

## **Assessment judgements**

### **Physics Assignment (National 4) Added Value Unit**

This year, a number of centres selected for verification for the National 4 Added Value Unit appeared to have used National 5 assignment evidence that was copied and submitted as National 4 evidence. Frequently, this did not allow the candidates to gain marks for parts of assessment standards where they had to link the topic to society/environment. Those centres which supplied only National 4 evidence demonstrated clearly where the marks had been allocated.

At National 4, Assessment standard 1.1 requires candidates to make a clear statement at the beginning of the research stage about the topic being selected. This statement must include physics knowledge to show a clear understanding of the topic selected. Most centres did not supply the overall statement covering the topic selected but the underlying physics was clearly available for this assessment standard.

None of the centres selected this year supplied the log book with the final report, and this made it difficult to fully assess the attainment of assessment standard 1.1 and 1.3. Most candidates did supply the raw data within the written reports/presentations, which allowed the processing of data to be checked.

Under assessment standard 1.3, it is not sufficient merely to work out mean values as a form of processing; candidates should carry out further calculations or draw a graph/chart. Both the calculation of mean values and the plotting of

point/bar heights should be counted when assessing the accuracy of the processing of data. When a scatter graph is used, candidates should be encouraged to draw the line of best fit and not join the points with straight lines. It should also be noted that the candidate should round values where appropriate, applying the standard rules for rounding.

### **Researching Physics (Higher)**

At Higher, assessment standard 1.1 requires candidates to make a clear statement at the beginning of the research stage as to the topic being selected. This statement must include Higher level physics knowledge to show a clear understanding of the topic selected. Most centres 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 in small groups, who designed the practical/experimental setup. This was clear in the similarity of results used by individual candidates in the communicating phase of the Researching Physics unit.

Assessment standard 2.2 requires candidates to record measurements in the most appropriate formats. Most candidates presented their results in tables.

### **Investigating Physics (Advanced Higher)**

Centres supplied visiting verifiers with interim evidence for Investigating Physics (Advanced Higher).

For assessment standard 1.1, candidates selected clearly stated what the investigation was about, but their level of knowledge was often below that expected at Advanced Higher level.

In assessment standard 1.2, candidates must complete a practical investigation with a clear aim. At Advanced Higher level, groupwork is not allowed for the Investigating Physics unit. Rather this must be undertaken **individually** and usually involves multiple experimental techniques.

The information supplied should be sufficiently detailed, including measurements to be taken and any risks associated with the procedure, to allow another person to be able to carry out the practical/experimental stage.

Assessment Standard 1.3 is the completion of the practical work and, again, must be carried out individually. Candidates must collect relevant data and record this in the most appropriate format; this should include repeated measurements, where appropriate, and calculated averages. Candidates should record all associated uncertainties as they complete each practical activity. At this stage of the investigation it is not necessary to carry out a full analysis of the uncertainties.

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

Centres are again reminded that, unless they have a large uptake at Advanced Higher level, there is no reason for multiple candidates from the same centre to be investigating the same topic. It was disappointing to find that a small number of centres, who had a low number of presentations, were allowing multiple candidates to investigate the same topic, eg 'g', frequently using the same methods.

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## Section 3: General comments

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 does not cover all assessment standards with one response then they should be encouraged to redraft, or change the activity. All assessment standards must be assessed, even if the candidate has already achieved a high enough mark to allow a pass to be recorded.

For the Researching Physics unit (Higher), centres can use the evidence of candidates achieving the unit as evidence of outcome 1 in the other units, without the need to match evidence.

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

Most centres selected for verification had an effective internal verification process, which ensures consistent standards across the whole centre, and not just within one teaching group.

Centres have developed an internal verification policy that applies across all Higher and Advanced Higher units including the Researching Physics and/or the Investigating Physics units.