



# **Questions & Answers**

## **Changes to assessment in National 5 Computing Science**

This edition: August 2017, version 1.1

## Contents

<b>1</b>	<b>Revised National 5 Computing Science course specification</b>	<b>1</b>
<b>2</b>	<b>Support materials</b>	<b>3</b>
<b>3</b>	<b>Units</b>	<b>4</b>
<b>4</b>	<b>Course assessment: question paper</b>	<b>5</b>
<b>5</b>	<b>Course assessment: coursework</b>	<b>5</b>
	a) Format of assignment	5
	b) Conditions of assessment	7
<b>6</b>	<b>Course content</b>	<b>8</b>
	a) Software design and development	9
	b) Computer systems	10
	c) Database design and development	10
	d) Web design and development	13
<b>7</b>	<b>Changes to Computing Science courses at other levels</b>	<b>13</b>

# 1 Revised National 5 Computing Science course specification

## **I thought only the unit assessments were being removed, why is there so much change to the course specification?**

Because the units have been removed from the National 5 course, we need to strengthen the course assessment to ensure it assesses the full content of the course. In revising the course assessment, we have changed the assignment from a bank of internally assessed tasks to a single, annually issued task that will be externally marked. This follows the significant feedback we received from the teaching profession through our computing science survey and Understanding Standards events — as well as our work with the National Qualifications Support Team (NQST) and Computing at Schools Scotland (CASS).

The units and the bank of assignment tasks provided some optional content for the National 5 Computing Science course that was not explicitly stated in the course specification or course assessment specification. Now that the units and bank of assessment tasks are being removed, we have incorporated this content into the revised course specification as a requirement.

To address concerns around the volume of content in the course, we have removed some sections of the previous course content; including technical implementation, contemporary developments and sections on security risks, legislation and environmental impact.

## **The timing of these changes is extremely challenging. Can the implementation of the revised course specification for National 5 be delayed until session 2018–19?**

No. The Deputy First Minister announced in September 2016 that units are to be removed from the courses from session 2017–18 onwards. The removal of units and the implementation of the revised course assessments will take place according to the timeline that was agreed by the Assessment and National Qualifications Group (ANQ). The revised National 5 course specification (dated May 2017) is valid from session 2017–18 and now replaces the April 2016 course specification and course assessment specification.

## **There appears to be new content in the revised course specification, yet we were assured that there would be no change to the content of the courses. Why has new content been added?**

The content is not new — where required, we have provided additional clarity and further detail. We have also confirmed all mandatory content, some of which previously might have been considered as optional.

The most significant change to the course specification is that we have provided clarity in database implementation from 'the use of the database application' to 'the use of SQL to implement database implementation'. Candidates previously had the option to use SQL when producing evidence for the Information System Design and Development unit (as outlined in the unit assessment support pack), however it was not a requirement. We have now confirmed the

use of SQL and included it as a requirement in the database design and development area of the course. This gives database design and development a strong computing science focus.

We have provided clarity relating to the relationship between CSS and HTML. This follows feedback we received from teachers that it is more common to teach HTML and CSS together and that many centres already do this. This will also create a smoother progression between National 5 and Higher.

### **The Deputy First Minister announced the removal of units to reduce teacher workload, won't the changes to course assessment increase it?**

The removal of units and unit assessments, as well as the changes to course assessment, should reduce teacher workload and free up more time for learning and teaching. The assignment will now be externally marked by SQA, so teachers will have a reduced role in administering the assignment. Candidates will also have a maximum of 8 hours to complete the assignment.

SQA is also working with Education Scotland to produce a range of supportive resources to help teachers to deliver the National 5 Computing Science course. These resources will be made available via Glow and we will also provide links to them via the National 5 Computing Science web page.

### **How should we decide whether to enter candidates for National 4 or National 5?**

The Scottish Government has provided guidance on candidate progression and entries in its [policy statement on the changes to assessment in National Courses](#).

### **Can you confirm that candidates will not be assessed on content that has been removed from the National 5 course, eg technical implementation — hardware/software/storage/networks?**

Yes, we will only assess candidates on the contents of the revised National 5 course specification.

### **Is the National 5 course now more aspirational for the minority who code rather than accessible to the majority?**

Coding skills are essential for employment in the computing sector and it is appropriate that they are developed and assessed within the National 5 course. There has been no change to the aims, principles or rationale of the course.

### **According to the revised course specification, candidates will be expected to write in a programming language, SQL, HTML and CSS — as well as be able to read Javascript and SQA's *Reference language for Computing Science* document. Surely that's too much to ask of candidates?**

While the revised National 5 course specification includes five coding technologies, the course only touches the surface of each. Many schools already teach web coding within the broad

general education. The depth of coding required in the software development and design area of the course has not changed, we have provided clarification that three standard algorithms are appropriate at this level.

- ◆ HTML and CSS — these are simple languages for learners to understand and implement. As HTML has been developed in line with CSS it no longer makes sense to teach HTML on its own first.
- ◆ SQL — SQL focuses on a more computing science method of querying databases and starts the process of moving away from the strictly ‘application package’ approach that would normally be taught in an administration and IT course.
- ◆ JavaScript — there will be no requirement to code JavaScript. A couple of copied and pasted examples of JavaScript code is a satisfactory approach to teaching ‘mouse over’ and ‘mouse out’ events at National 5.

It is also important to note that the requirement to write code will be mostly sampled by the assignment, which is open book and carried out under a high degree of supervision and control. The question paper will be more focused on reading and explaining code.

## 2 Support materials

### **Will support materials be provided by SQA and when will these be available?**

Yes. A revised specimen question paper and specimen assignment task will be published on the National 5 Computing Science web page between the end of May and the end of September 2017 — these will be accompanied by marking instructions. We will endeavour to publish these materials at the earliest opportunity and we will advise centres when they are available.

We are also working with Education Scotland to identify and adapt suitable learning and teaching materials and make these available on Glow. Course support notes will contain links to these resources, along with further clarification/exemplification of the course specification. To support you, we have produced these links in the *Resources to support the National 5 Computing Science course* document, which can be found in the ‘Additional course support’ section on the subject page of our website. This document will be incorporated into the course support notes by the end of September 2017.

### **What if I do not have access to Glow?**

Staff in all local authorities can get a login for Glow. Details can be found via the following link: <https://connect.glowscotland.org.uk/2015-how-do-i-get-a-login/>.

### **Will Bitesize be updated soon?**

Bitesize is a BBC product. We anticipate that the BBC will update it by the start of the 2017–18 session.

### **When will teachers get a complete set of notes?**

SQA does not produce off-the-shelf teaching materials. However, in conjunction with Education Scotland, we will source teaching materials and CPD training links. We will also produce further appendices to clarify how we will represent areas of the course in exams and assignments. These will be added to the *Resources to support the National 5 Computing Science course* document, which will be incorporated into the course support notes by the end of September 2017.

## **3 Units**

### **Are there now four units in the course?**

No. As announced by the Deputy First Minister in September 2016, units and unit assessments have now been removed from National 5 courses. Candidates will now be assessed through the revised National 5 course assessment only.

In the revised course specification for National 5 Computing Science, the course content is now organised into four key areas but these are not units. The four content areas should be regarded as curricular organisers. Centres are free to adjust the format, layout and construction of these areas to suit specific delivery patterns.

### **Will the two existing units be updated to reflect the revised course specification?**

No. These units are no longer part of the National 5 Computing Science course. They will be available as freestanding units and will remain in their current format.

### **Will it be possible to continue teaching the National 5 course to bi-level National 4/5 classes now that the units have been removed?**

Yes, with careful planning it should be possible to continue bi-level teaching of National 4 and National 5 Computing Science. However, decisions about curriculum models for learners in the senior phase remain a matter for local authorities and schools, and should be based on the needs of their candidates.

### **Will the arrangements for a compensatory National 4 award remain?**

The Scottish Government has made it clear in its [policy statement on the changes to National Courses](#) (Annex B) that the current mechanism of fallback to National 4 'will remain available for an **interim period only**', and that this pathway 'should only be used in a very limited number of exceptional circumstances, where the view of the teacher and head teacher, in discussion with parents and learners, is that it is in the interests of specific individual learners'.

SQA is currently working through the operational implications of this change. We will communicate how centres will be able to access this in due course.

### **Are the unit thresholds the same this year?**

Yes, the thresholds introduced for 2016–17 will continue to apply to units from National 3 to Advanced Higher, and for the freestanding SCQF level 5 units that were previously part of National 5 courses.

## **4 Course assessment: question paper**

### **Will candidates be expected to write syntactically correct HTML, CSS, Javascript and SQL in the exam?**

We will mainly assess the writing of SQL, CSS and HTML within the assignment. The question paper is more focused on the reading and explaining of code. However, where candidates are asked to write code, marks will be awarded as long as the intention of the coding is clear. This is in line with the current marking principles.

There is no requirement to write Javascript in the National 5 Computing Science course.

### **Will coding questions in the question paper still give three options for answering: pseudocode, SQA reference language and language of choice?**

Candidates will be able to answer using pseudocode or their programming language of choice. This may include SQA reference language, however it is worth emphasising that although we will present code using SQA reference language there is no requirement for candidates to write code in this language. If candidates do write in SQA reference language, they will be awarded marks as appropriate.

## **4 Course assessment: coursework**

### **a) Format of assignment**

#### **What's the balance between difficulty and size/number of tasks in the assignment?**

The assignment will consist of three tasks; one for each of software design and development, database design and development, and web design and development. The assignment is intended to differentiate between candidates and will be designed with a proportion of grade A-type marks. This will be exemplified in the specimen assignment task.

#### **How many tasks are there to choose from?**

The assignment is a single assessment that is valid for the specified year of certification only. There is no optionality; candidates are required to complete all three tasks that make up the assignment.

### **Can you give an idea of what the assignment will look like?**

The specimen assignment task will provide guidance on what the assignment will look like. It will consist of three tasks with marks allocated across course content and skills as follows:

Course content:

- ◆ Software design and development (25 marks)
- ◆ Web design and development (10-15 marks)
- ◆ Database design and development (10-15 marks)

And across skills as follows:

- ◆ Analysis (5 marks)
- ◆ Design (5 marks)
- ◆ Implementation (30 marks)
- ◆ Testing (5 marks)
- ◆ Evaluation (5 marks)

### **Can the assignment be split into sections?**

Yes. The assignment should be completed over a number of sessions that amount to 8 hours in total, as it would not be appropriate or realistic to complete the assignment in a single 8-hour sitting. The assignment will be issued in late January and should be undertaken by candidates at a point when they have covered the course content assessed in the assignment.

### **If the assignment is split into sections, can teaching take place in between assessment activity?**

No. The assignment must be undertaken over an 8-hour period that is not broken by periods of teaching.

### **Will the assignment style be piloted to ensure that the time is sufficient and the instructions are clear enough for candidates to tackle without support?**

Yes. The specimen assignment task will be piloted to ensure that it can be completed within the allotted time and that candidates can progress through the tasks without support.

### **When will the specimen assignment task be available?**

The specimen assignment will be available by the end of September 2017. We will endeavour to publish these materials at the earliest opportunity and we will advise centres when they are available.

### **When will the live National 5 assignment be issued?**

The live assignment task will be made available via the secure website at the end of January 2018.

### **Will SQA still accept electronic submissions, for example OneNote?**

No. All candidate evidence for the assignment (whether handwritten or word processed), must be submitted to SQA in hard copy. This includes hard copies of program listings, screenshots or similar, as appropriate.

### **Can we still use Access for the coursework?**

Yes, you can still use Access for databases using the SQL view to write SQL statements. No database server is required for National 5.

### **Will the database task need to be done in SQL?**

Yes, some parts of the database task will require to be done in SQL.

### **Can National 5 coursework be used to assess a National 4 qualification?**

No, the changes to the National 5 coursework mean that it does not match the assessment standards for the National 4 added value unit.

## **b) Conditions of assessment**

### **Can teachers provide support to candidates while they are being assessed (deducting marks where support is given)?**

No. The assignment is designed to be completed by candidates without any teacher support. It will be externally marked, therefore deducting marks for providing support is no longer applicable.

### **Does an 8-hour limit for the assignment mean that skills will not be assessed?**

The course assessment will continue to assess both knowledge and skills and the assignment task will be tested to ensure that it is achievable within the time allocated.

### **Are centres required to organise invigilators for the 8-hour coursework to ensure the conditions of assessment are applied?**

This is not a requirement, however it is for the centre to decide how to organise supervision of the assignment in line with the conditions of assessment.

**The course specification states that at the end of each session, and upon completion of the assignment, the teacher must ensure that candidate evidence is stored securely. What does this mean?**

Centres can store candidate evidence in the way that they find most appropriate but must ensure that candidates cannot access their work from outside the classroom (eg when at home).

**If candidates use flash drives for the assessment, how do we backup? Presumably they can't copy onto their home folders as a backup, but we therefore run the risk of candidates losing their work through a lost/corrupted flash drive.**

It is for centres to choose the most appropriate backup approach. An example of this could be to use a folder on the network which staff secure at the end of each classroom session.

**Will those who usually require extra time as an assessment arrangement request be able to have this when doing the assignment?**

Yes. All assessment arrangement requests should be submitted by centres to SQA following the normal process and should reflect the candidate's routine way of working.

We have been carrying out an Equality Impact Assessment on the specific changes to course assessment at National 5 and are considering the potential impact of these changes to learners with protected characteristics, and how our existing arrangements could reduce this. In session 2017–18, our assessment arrangements team will also monitor the impact of the changes on candidates to determine if any further actions are required. Equality Impact Assessments will also be built into our processes for revising the course assessments at Higher and Advanced Higher.

**Can candidates use their own reference material/notes during the assessment, ie an open-book assessment?**

Yes, the assignment is open book.

## **6 Course content**

The following questions and answers relate to the four key topic areas of the National 5 Computing Science course and discuss the technical content of the course.

A selection of resources to support the delivery of the National 5 course are in the *Resources to support the National 5 Computing Science course* document, which can be found in the 'Additional course support' section on the subject page of our website. This document will be incorporated into the course support notes by the end of September 2017.

## **a) Software design and development**

### **How can a user interface be shown with Python?**

It is acceptable, with a text based language, to show a user interface as a series of expected inputs and outputs in text.

### **Why has exemplification of pseudocode to solve problems been removed?**

The requirement for all candidates to be able to use pseudocode has been removed from the course and replaced with a requirement for at least one of pseudocode, structure diagrams or flowcharts. This is to allow candidates to use alternative design techniques to show solutions to problems.

Candidates should be familiar with all three techniques in order to read and understand a design presented in each, but will only be asked to exemplify and implement a design using one technique of their choice.

### **Is CASE being used?**

The course specification only states selection constructs and the SQA reference language doesn't have a CASE construct, so we would not ask candidates to use a CASE construct in the assignment or question paper. If a candidate has learnt a programming language with a CASE construct, this could be used in their response to an assignment task or exam question and would be credited with marks as appropriate.

### **The pseudocode exemplified in appendix 1 uses a modular approach. Will this format be used in the assignment/question paper?**

Yes, although there is no requirement for the candidates to design using a modular approach or to implement modular code. As the Higher is a modular approach we felt that it was better to keep the approach for pseudocode at National 5 in a similar style.

### **As before, would you expect the user interface design to be annotated?**

We would expect candidates to annotate the user interface design but there may be times when the design is so self-explanatory that there is little benefit. At National 5 level it would be appropriate to give candidates specific instructions in the question if annotations were required.

### **Should candidates show button names and listbox names?**

Language-specific additions are not required but candidates could include them if they feel that it helps to clarify the design.

## **Do candidates need to know what the different shapes mean in the design techniques?**

Yes, the exam questions and assignment tasks will use the symbols we've identified in the appendices and candidates are required to be able to read and understand design techniques. If candidates are asked to produce a design, the marking will focus on the solving of the problem rather than the correct use of the symbols.

## **b) Computer systems**

### **Why has all the technical implementation content been removed?**

To address concerns around the volume of content in the course, we have removed some sections of the previous course content. Technical implementation was removed as it was a large section of content which only represented a small proportion of marks in the course assessment. It also wasn't included in the aims of the course.

### **Why has cyber security content been removed?**

Cyber security featured at National 5 but not at Higher. Security has been revised to provide a progression through the levels. A separate Cyber Security National Progression Award (NPA) is available for centres to deliver.

### **Networks and security have been removed. Isn't this basic theory that any computing scientist must know?**

Security has not been removed completely. We have removed certain aspects of security from the course that relate to digital literacy. This keeps the course more focused on the computing science aspects. While these aspects are no longer a mandatory requirement of the course, teachers may choose to cover them during learning and teaching time, as long as candidates are aware that they will not be assessed on this content.

## **c) Database design and development**

### **Why has implementation of SQL been introduced?**

SQL was previously included in a unit assessment support pack as one means of scripting an information system. We have now brought this into the mandatory content and provided additional detail, giving the database section of the course a strong computing science focus. The specimen assignment task and specimen question paper will exemplify SQL requirements.

### **Isn't the introduction of SQL too much to ask of National 5 candidates?**

We are already aware of a number of centres that successfully use SQL in the broad general education and with their National 5 candidates to aid their progression through Higher and

Advanced Higher. Introducing basic SQL statements at National 5 will create a smoother progression for candidates who move on to Higher and Advanced Higher.

### **How can I upskill in SQL?**

We are working with Education Scotland to identify and share resources for teachers who require further support with SQL, as well as resources that can be used with candidates. These will be included as a table of resources in the course support notes being published in September. A copy of the table of resources is being made available in advance of the course support notes being published.

### **How many marks will be allocated to SQL?**

The writing of code will mainly be assessed in the assignment, while reading and explaining code will feature in the question paper. Overall, the total marks for implementation in database design and development (which is not exclusively SQL) is 13–23 marks. Between 5–10 marks will be allocated to database implementation in the assignment.

### **Why does the entity-relationship diagrams part of the course now include attributes?**

We have provided additional clarity and detail relating to database design. Attributes are important to the overall understanding of the design. Further exemplification of entity-relationship diagrams with attributes can be found in appendix 5 of the *Resources to support the National 5 Computing Science course* document. This document can be found in the 'Additional course support' section on the subject page of our website and will be incorporated into the course support notes by the end of September 2017.

### **Will National 5 candidates be expected to normalise to 2NF?**

No. This is not included in the National 5 course specification therefore it will not be assessed.

### **MS Access SQL Jet engine is quite different from mySQL, SQLi. Which version will exam questions be written in?**

We will accept variations of SQL in candidate responses. Further information on SQL will be provided in the course support notes.

### **What is an equi-join between tables?**

An equi-join is required when a SQL search includes data in two tables. The equi-join indicates the primary and matching foreign keys in the two tables allowing the search result to combine the linked field data in its output.

### **How correct does the SQL have to be, can it be written in English?**

Markers would take into account different variations of SQL and candidates would not be penalised for incorrect syntax but we would expect candidates to attempt to write in SQL

**Is the ‘size’ only required for text fields?**

Yes.

**Can candidates use ER diagrams as in example 2 of appendix 5 in the *Resources to support the National 5 Computing Science course* document?**

In appendix 5, example 1 shows an ER diagram with their attributes and example 2 shows the same ER diagram without the attributes. Any exam question or assignment task would clearly indicate whether or not the attributes were required in the ER diagram.

**Would ER diagrams need to be drawn as in example 1 of appendix 5 *Resources to support the National 5 Computing Science course* document to get all the marks?**

Candidates wouldn't be asked to create a complete ER diagram with attributes in the assignment nor the question paper. However, they may be asked to complete a partially created ER diagram with attributes.

**The ER diagram is different from how they were used in Higher assessment — do candidates have to follow your format or is a different way ok if it is clear?**

The examples we have used in the appendices are the way that the SQA will represent ER diagrams in exams or assignments but candidates can use any other acceptable format.

**Do candidates have to write the relationship on the link in an ER diagram or is this just the way SQA will do it? This has not been required at Higher in the past.**

As there is only the one to many relationship within the National 5 course it was decided that it was important to get the candidates to write the relationship in the link.

**Will primary keys be shown with underline in ER diagrams?**

Yes the primary keys are underlined and the foreign keys are starred (\*).

**Could completing an ER diagram mean that candidates could be asked to add the ‘is location for’ detail?**

Yes, candidates could be asked to add the relationship between the entities.

**In the data dictionary example, there is a ‘Required’ column. ‘Required’ is not in the course specification so is it necessary to include it? Should ‘Required’ not be under validation?**

The required column is to show the presence check which is in the course specification. It could be under validation but we have chosen to give it a separate column. Candidates would not be penalised for not having a required column and showing the presence check under the validation column. Once again this shows the way that we will represent data dictionaries within question papers and assignments. In question papers and assignments candidates will be given the data dictionary table with the column headings and asked to complete.

## **The query design is a different format than was used previously, why has it changed?**

Candidates can use any format to show their query design, this format is the one that the SQA will use within question papers or assignments. It has changed to flow more seamlessly with the SQL when candidates come to implement their design.

## **d) Web design and development**

### **What does implementing prototyping (low fidelity) mean?**

A low fidelity prototype is a rough representation that helps validate concepts early in the design process. Examples and websites that candidates can use to implement prototyping will be provided within the course support notes.

### **Do candidates need to add text sizes and styles to their designs?**

No, although we may annotate designs with text sizes and styles for the purpose of exam questions or assignment tasks.

### **Would generic text box/image boxes be appropriate for wire frames?**

Yes.

## **7 Changes to Computing Science courses at other levels**

### **Why are changes only being made from National 5 to Advanced Higher levels?**

At present, SQA has been asked to take forward the nationally-agreed revisions to National 5, Higher and Advanced Higher only.

### **Is National 4 staying the same for the current year?**

Yes, there will be no changes to National 4 in session 2017–18

### **Are there plans to change the National 4 course?**

At present, SQA has only been asked to take forward the nationally-agreed revisions to National 5, Higher and Advanced Higher.

The Assessment and National Qualifications Group (ANQ) has begun to consider the approach to assessment in National 4 courses. Its initial focus is on the value of a form of external assessment, and a means of differentiation through grading.

**Is it possible for SQA to provide some indication of the upcoming changes to Higher and Advanced Higher before session 2018–19?**

At this stage, only the changes to National 5 have been fully developed to completion. The changes to assessment at Higher and Advanced Higher have been considered alongside the changes to National 5, however these are very much in the early stages and will require further development. We will continue to work with the National Qualifications Support Team (NQST) and Computing at Schools Scotland (CASS) during this development phase. Timescales for publishing revised documents for Higher and Advanced Higher have still to be confirmed and we will provide further information in due course.

**What should I teach at Higher level in session 2017–18?**

The Higher course is unchanged and should be taught as normal. Units will be removed from the Higher course from session 2018–19 onwards. We will review the Higher course assessment in light of the removal of units and the changes to assessment at National 5. Further information will be provided in due course.

**When will the revised course specification for Higher be published?**

Timescales for publishing the revised Higher documents will be confirmed in due course.