



National Unit specification

General information

Unit title: Computing: Creating and Evaluating Software
(SCQF level 4)

Unit code: H6S8 44

Superclass: CB

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Version: 01

Unit purpose

This Unit is designed to give learners an introduction to the software development cycle as well as providing opportunity to learn basic programming concepts and to compare previous and current software package user interfaces. This Unit is suitable for a wide range of learners who may be interested in pursuing the programming route in their future academic or professional careers. As the Unit introduces learners to the basic programming concepts, it is a suitable foundation Unit for a wide range of programming based qualifications.

Outcomes

On successful completion of the Unit the learner will be able to:

- 1 Describe sequential stages of the software development cycle.
- 2 Identify and compare previous and current software package user interfaces.
- 3 Create a program to a given brief.

Credit points and level

1 National Unit credit at SCQF level 4: (6 SCQF credit points at SCQF level 4)

Recommended entry to the Unit

Entry is at the discretion of the centre. However, it would be advantageous if learners possessed basic IT skills.

National Unit specification: General information (cont)

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Core Skills

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill Problem Solving at SCQF level 4

Core Skill component Accessing Information at SCQF level 4

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of the Unit Specifications for this Course.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

National Unit specification: Statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Describe sequential stages of the software development cycle.

Performance Criteria

- (a) Identify the stages of the software development cycle.
- (b) List the stages of the software development cycle in sequence.
- (c) Describe the activities in each stage of the software development cycle.

Outcome 2

Identify and compare previous and current software package user interfaces.

Performance Criteria

- (a) Identify a previous software package user interface.
- (b) Identify a current software package user interface.
- (c) Compare two selected software package user interfaces.

Outcome 3

Create a program to a given brief.

Performance Criteria

- (a) Plan a program to satisfy the given brief.
- (b) Create a solution with basic programming concepts and data types.
- (c) Create a program with limited assistance.
- (d) Test the program with suitable test data.
- (e) Identify and rectify errors.

National Unit specification: Statement of standards (cont)

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Evidence Requirements for this Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

Evidence is required to demonstrate that learners have achieved all Outcomes and Performance Criteria. However, sampling may be used in certain circumstances (see below) where the sample is sufficiently random and robust to clearly infer competence in the complete domain.

The evidence for this Unit may be written, oral, performance based, product or a mix of these. Evidence may be stored in a range of media. Evidence may be captured, stored and presented in a range of media (including audio and video) and formats (analogue and digital). Particular consideration should be given to digital formats and the use of multimedia.

Outcome 1

Written/oral evidence of cognitive competence may be sampled across the knowledge domain defined by this Unit specification, so long as the sample is unknown to the user.

Stage in Investigation	Activities
Analysis	Client interviews, questionnaires
Design	Pseudocode, graphical designs
Implementation	Creating the design
Testing	Normal, extreme, exceptional
Documentation	User guide, technical guide
Evaluating	Fit for purpose
Maintenance	Corrective, perfective, adaptive

Written and/or oral evidence is required which demonstrates that the learner has achieved Outcome 1 to the standard specified in the Outcome and Performance Criteria. The evidence for this Outcome should be obtained under controlled, supervised conditions.

Outcome 2

Where written or oral evidence of the learner comparing user interfaces is generated without supervision some means of authentication must be carried out (such as oral questioning, source review). The centre should ensure that the comparison is to an adequate depth for this Unit level.

Given the level of this Unit, the amount of evidence, and corresponding time spent on assessment, should be minimised but sufficient to satisfy the above requirements.

National Unit specification: Statement of standards (cont)

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Outcome 3

The learner's completed solution should make use of selecting and using expressions, sequence, selection and iteration and suitable data types.

The learner should supply a plan for the program and a copy of the program listing. When testing has been carried out copies of the test data and results should also be submitted. If the learner supplies a working program it is assumed they have successfully identified and rectified any errors found.

The completed solution must be produced by the learner without assistance. Authentication must be used where this is uncertain.



National Unit Support Notes

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Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

The purpose of this Unit is to provide foundation knowledge and basic skills of computer programming. This Unit is part of the **NC in Computing with Digital Media at SCQF level 4**.

Outcome 1

A key objective of this Unit is to ensure the learner is aware of and can describe the steps involved in the software development cycle in sequence. These steps are:

- ◆ Analysis
- ◆ Design
- ◆ Implementation
- ◆ Testing
- ◆ Documentation
- ◆ Evaluation

Outcome 2

Although during this Unit is the theoretical aspect of the software development cycle and the ability to produce a program to a brief, the learner is also provided with the opportunity to compare previous and current user interfaces in software packages. The learner should be encouraged to become familiar with the concept of a user interface (UI) and appreciate that it is a key (and varying) feature of every computing device.

Outcome 3

An important aim of the Unit is to provide the learner with experience of basic programming concepts. This includes the following concepts: fixed loops; conditional loops; if statements or use of case statements.

National Unit Support Notes (cont)

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Guidance on approaches to delivery of this Unit

It is suggested that, to introduce learners to the software development cycle, a case study based on a current software package is used, showing stages of the cycle and how prototypes are created. This could include apps and their updates from iTunes™, Android Market™, Google Play™, etc or a larger program case study.

It is recommended that learners research several previous and current user interfaces. One of each could then be compared in any appropriate form, for example as a report, blog, video or voice recording.

To engage learners the programming activities and final brief should relate to their personal or vocational interests. For example, the use of a loop in a program based on film reviews asking the user for the number of films they are rating, the name of the film, the star rating and perhaps review comments or film age certificate.

The actual distribution of time between Outcomes is at the discretion of the centre. However, one possible approach is to distribute the available time as follows:

Outcome 1: 10 hours
Outcome 2: 10 hours
Outcome 3: 20 hours

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

The evidence of the practical abilities should be acquired from the completion of an unknown brief set by the centre covering programming concepts such as the use of a loop, conditional statement, etc.

Assessment of the learner's knowledge and understanding of the software development cycle could be by a multiple choice test consisting of 20 questions with a pass mark of 12 (assuming each question had four possible answers).

The assessment of the learner's comparison of previous and current user interfaces could be in the form of a blog. This would record, in writing and via embedded objects or links to them, the learner's comparison on the user interfaces. Alternatively the learner could create a voice or video recording with their user interface comparison. The centre should ensure that the comparison is to an adequate depth for this Unit level.

National Unit Support Notes (cont)

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Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Opportunities for developing Core and other essential skills

This Unit will provide opportunities for learners to develop Core Skills in *Information and Communication Technology (ICT)*.

This Unit has the Core Skill of Problem Solving embedded in it, so when candidates achieve this Unit their Core Skills profile will be updated to show that they have achieved Problem Solving at SCQF Level 4.

This Unit has the Accessing Information component of Information and Communication Technology embedded in it. This means that when candidates achieve the Unit, their Core Skills profile will also be updated to show they have achieved Accessing Information at SCQF level 4.

History of changes to Unit

Version	Description of change	Date

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General information for learners

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This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit is an introduction to programming and the steps involved in creating programs called the software development cycle.

The Unit covers practical skills and key knowledge about the software development cycle. You will learn the basics of computer programming by completing practical tasks as well as comparing previous and current user interfaces (UI) for computer programs.

The assessment of this Unit may take different forms. You may, for example, sit a short test and carry out some practical tasks. The assessment will be straight forward and will not take much time.