National Unit Specification

General information

Unit title: Computing Project (SCQF level 6)

Unit code: J8DY 46

Superclass: CB

Publication date: July 2024

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

The purpose of this unit is to challenge learners to apply existing knowledge and skills in a complex practical context, and develop the skills required to be an effective member of a team.

The unit is suitable for learners with secure existing knowledge and skills in computing, who wish to apply these in a project-based context. The project can relate to a wide range of contexts including, but not limited to, programming, data security, and data analysis. It will give learners the opportunity to develop and evaluate skills in planning, collaboration, communication, and team working.

Learners are required to produce a solution to a given project brief. The project brief will require learners to solve a complex problem using computing technology. Learners will analyse the brief before planning, designing, implementing, and testing a solution. Learners will document their progress and reflect on the development of their skills.

The project will be completed by a project team, comprising two to four learners. Each learner must carry out an evaluation of the completed project and the skills that they have developed.

Learners may wish to progress to qualifications at SCQF level 7.

National Unit Specification: General information (continued)

Unit title: Computing Project (SCQF level 6)

Outcomes

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

1. Contribute to a project plan from a project brief.
2. Contribute to the design of a solution.
3. Contribute to the development and testing of a solution.
4. Evaluate their contribution to the project.

Credit points and level

1 National Unit credit(s) at Scottish Credit and Qualifications Framework (SCQF) level 6: (6 SCQF credit points at SCQF level 6).

Recommended entry to the unit

Entry is at the discretion of the centre, although learners will require to have sufficient skills and knowledge in a specific area of computing at level 6 on which the project can be carried out. Learners should also have some prior experience of working as a team to complete a project.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

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.

This unit is context free in the sense that the project may relate to a wide range of computing fields such as programming, cyber security or data analysis.

If this unit is delivered as part of the National Progression Award in Computing Technologies, it should be undertaken after the mandatory unit J8DW 46Computing Foundations and two optional units have been completed. For example, if learners have completed J8DW 46Computing Foundations (mandatory), F3SY 12 Computer Hardware and Systems (option), and J744 46 Esports: Game Performance (option), the project could relate to building a gaming PC.

National Unit Specification: General information (continued)

Unit title: Computing Project (SCQF level 6)

The project must be undertaken in a team, comprising two to four learners. Teams should be selected so that they comprise a mix of demographics and abilities, subject to constraints imposed by the learner population.

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: Internal Assessment Support Materials (www.sqa.org.uk/internal assessment support materials).

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:
SQA Assessment Arrangements (www.sqa.org.uk/assessmentarrangements).

National Unit Specification: Statement of standards

Unit title: Computing Project (SCQF level 6)

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

Contribute to a project plan from a project brief.

Performance criteria

(a) Contribute to a detailed project plan including tasks and timescales.
(b) Contribute to the identification of resources required to undertake the project.
(c) Contribute to assigning roles and responsibilities to each team member.

Outcome 2

Contribute to the design of a solution.

Performance criteria

In collaboration with team members:

(a) Contribute to detailed hardware requirements.
(b) Contribute to detailed software requirements.
(c) Contribute to the design of the user interface or usability.
(d) Contribute to the detailed design of procedures, security and performance.
(e) Contribute to a detailed test plan.

Outcome 3

Contribute to the development and testing of a solution.

Performance criteria

In collaboration with team members:

(a) Contribute to the development of a solution, consistent with the design.
(b) Contribute to detailed product testing, consistent with the test plan.
(c) Contribute to detailed product documentation.
(d) Contribute to product deployment.

National Unit Specification: Statement of standards (continued)

Unit title: Computing Project (SCQF level 6)

Outcome 4

Evaluate their contribution to the project.

Performance criteria

(a) Evaluate the project team's adherence to the project plan.
(b) Evaluate personal contribution to the project.
(c) Explain challenges and successes during the project.
(d) Evaluate the development of meta-skills during the project including team working, communication and collaboration skills.

Evidence requirements for this unit

Evidence is required to demonstrate that learners have achieved all outcomes and performance criteria. The evidence requirements for this unit will take two forms.

1. Product evidence.
2. Performance evidence.

The **product evidence** will relate to all outcomes and will comprise the following.

1. Detailed project plan including tasks, timescales, roles and resources.
2. Design documentation relevant to the project.
3. Comprehensive test plan and test results.
4. Product (solution) and product documentation.
5. Evaluation of adherence to the project plan, personal contribution to the project and development of meta-skills, and explanation of successes and challenges.

Items 1–4 will be produced by the project team. Item 5 must be produced by each learner. Product documentation (item 4) should comprise of technical and user documentation.

Project teams must comprise 2–4 learners and must not be self-selecting; assessors should select team members to reflect the mix of demographics and abilities in the learner group. For small cohorts, it may be necessary for teams to be made up of learners from across levels 4, 5 and / or 6. In this scenario, each learners' contribution to the project must be at the appropriate level.

The product evidence should be interpreted in the context of the project. For example, in the context of a programming project, the product (item 4) would be the created code; in the context of project relating to networking, the product would be the configured network. A theoretical, research-based project is **not** appropriate. Learners are required to demonstrate practical abilities.

National Unit Specification: Statement of standards (continued)

Unit title: Computing Project (SCQF level 6)

The project scope and complexity must be consistent with the level of this unit (SCQF level 6) and sufficient in scope to justify team work. The project should be complex or unfamiliar to learners. The key competencies relate to project planning, team working and self-evaluation, not the complexity of the product, although technical skills must be evidenced in the quality of the final product and the scope of the project must be sufficient to justify a team approach to the solution. Given the level of the unit, learners must work autonomously (in teams) without guidance or assistance from assessors.

Products must be fully working, although they may be incomplete in terms of their original (planned) functionality. Partially complete products must be justified in the evaluation of the learner's contribution to the project (item 5).

Product evidence may be produced over an extended period of time in lightly controlled conditions.

The **performance evidence** will relate to all outcomes and will comprise observation of each learner's conduct throughout the project. The key observed behaviours will relate to:

1. team working skills.
2. communication skills.
3. collaboration skills.
4. other meta-skills.

Each learner's contribution to the project must be evidenced. Each learner must make a **significant contribution** to each item of evidence, although specific learners may lead on specific tasks. It is permissible for an individual learner to satisfy the Evidence Requirements when the team does not. For example, an individual learner's contribution may be sufficient to satisfy the evidence requirements although the collective efforts of the team are insufficient. Conversely, the team may produce adequate evidence but an individual within the team may fail to make an adequate contribution.

When evidence is produced in loosely controlled conditions it must be authenticated. The guide to assessment provides further advice on methods of authentication.

The SCQF level of this unit (level 6) provides additional context on the nature of the required evidence and the associated standards. Appropriate level descriptors should be used when making judgements about the evidence.

The Support Notes section of this specification provides specific examples of instruments of assessment that will generate the required evidence.

National Unit Support Notes

Unit title: Computing Project (SCQF level 6)

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

This unit is a mandatory unit within the National Progression Award in Computing Technologies at SCQF level 6. It is intended to give learners the opportunity to use skills, knowledge and understanding developed through the successful completion of the other units within the award. The project should be based on the content of the units completed within the award and should reflect the particular emphasis individual centres have placed on the award, by their selection of optional units. The brief for the project can be created by a negotiation between the assessor and the learners, but the assessor must ensure it meets the requirements of the unit.

It is recommended that this unit is delivered towards the end of a programme of study, when learners are in a position to demonstrate the knowledge and skills they have accumulated over the course of study.

A wide range of projects are appropriate. These include projects relating to:

- computer programming
- computer networks
- computer games
- computer hardware
- computer software
- data science
- data security
- artificial intelligence
- emerging technologies

Suitable projects may relate to one of these topics in depth or a combination of them to less depth. For example, a project that involves configuring an office computer network would involve computer networks, computer hardware and computer software.

National Unit Support Notes (continued)

Unit title: Computing Project (SCQF level 6)

The project brief, which will be provided by the assessor, but subject to negotiation with learners, should be appropriate for level 6 and include:

- the area of computing on which the project will focus.
- a realistic scenario.
- a description of the essential criteria for a successful final product.
- any constraints on the project team.
- timescale for completion of the project.

The brief should offer sufficient flexibility to allow each group of learners to devise their own unique response to it.

The assessor should ensure that the specification produced by the learners, based on the project brief, will:

- allow learners to perform complex tasks in new contexts.
- contain elements suitable for SCQF level 6.
- provide learners with the opportunity to demonstrate a range of knowledge and skills from other units in the group award at SCQF level 6.
- provide the opportunity to produce a suitable solution to the project brief.
- provide groups of learners with a realistic chance of completion within the timescale.

The focus of the unit is working collaboratively through the project development process, rather than the implementation of a fully complete or successful solution. The project should provide opportunities for learners to explore and develop their meta-skills in the context of the information technology (IT) industry. The unit will cover the following knowledge and skills:

Knowledge	Skills
- Technical knowledge specific to project brief - Project planning - Roles in computing and IT industry - Project design - Project implementation - Project testing - Project evaluation - Meta-skill frameworks	- Technical skills specific to project brief - Team working and inter-personal skills - Problem solving skills - Communication skills - Collaboration skills - Other meta-skills - Organisational skills - Critical thinking skills - Time management skills - Initiative skills

National Unit Support Notes (continued)

Unit title: Computing Project (SCQF level 6)

Guidance on approaches to delivery of this unit

By delivering this unit in the later part of the academic year, it is expected that learners will have gained the knowledge, skills, experience and confidence required to carry out this unit effectively. This unit gives learners the opportunity to use previously acquired knowledge and skills in context and should not involve the re-teaching of other unit content.

The following distribution of time is suggested.

Outcome 1: 8 hours.
Outcome 2: 8 hours.
Outcome 3: 20 hours.
Outcome 4: 4 hours.

The unit involves learners working cooperatively and collaboratively as part of a team. The composition of each team should be selected by the teacher to ensure a representative mix of demographics and abilities within the learner group. Teams should comprise two to four members. For small cohorts, it may be necessary for teams to be made up of learners from across levels 4, 5 and / or 6. In this scenario, each learners' contribution to the project must be at the appropriate level. Teams should negotiate the roles and responsibilities of each team member. The assessor may give limited guidance, if necessary, but this should be avoided when possible.

Learners will find it helpful in understanding how they might approach this unit if they are given realistic examples of acceptable and achievable computing projects.

Acceptable / achievable projects will be those that:

- contain appropriately complex elements in the planning, design, implementation and evaluation stages.
- contain a manageable plan and a familiar set of resources.
- combine a manageable range of knowledge and skills from other units.
- encourage the learners to perform non-routine tasks.

Unacceptable / unachievable projects will be those that:

- have basic planning, design, implementation and evaluation.
- have an overly complicated plan and / or set of resources.
- replicate the evidence requirements in other units.

Assessors should consider the resources and facilities available when creating the project brief to give learners a realistic opportunity for success. Whilst the overall timescale of the project should be set by the assessor, the structure of delivery should be flexible to suit the nature of the project.

National Unit Support Notes (continued)

Unit title: Computing Project (SCQF level 6)

Depending on prior experience of learners, some teaching and learning may be required around the project development process, including project planning, design documentation, testing and evaluation. This should be delivered in general terms rather than specific to the given project brief.

Learners should also be given the opportunity to explore the meta-skills framework and the meaning of each meta-skill in the context of the IT industry. This could be done, for example, using the resources available from the Skills Development Scotland Meta-Skills Toolkit (**Skills Development Scotland**) and My World of Work (**My World of Work**).

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 scope and complexity of the project is a key discriminator in this series of units. The scope and complexity of project should reflect the level of the unit. At this level (level 6), projects must be complex or unfamiliar to learners and have broad scope.

When devising assessments, the evidence requirements should be interpreted in the context of the project. Items 1 and 5 (project plan and evaluation of personal contribution) will be similar for all projects, but the other items (design documentation, test plans and test results, and the solution and its documentation) will vary considerably, depending on the nature of the project. For example, the test plan for a programming project will be significantly different from a test plan for configuring a network.

The instrument of assessment will be a project. Learners are required to undertake the project in a team, comprising two to four learners, selected by the teacher. Teams should reflect the diversity of demographics and abilities of the wider learner group to replicate real world team working.

National Unit Support Notes (continued)

Unit title: Computing Project (SCQF level 6)

A project brief should be negotiated with each team. The brief will define the nature of the project. Assessment should be continuous and involve gathering a portfolio of evidence throughout the unit. Evidence should be produced naturally as learners progress through the project. Every learner in the team is expected to contribute to each item of evidence but some learners may play lead roles (in terms of leadership and effort) in the production of specific artefacts. Outcome 4 requires evidence from each learner.

In addition to the required artefacts (see evidence requirements), learner performance should be observed during the conduct of the project using an observation checklist, which will record their team working skills, communication skills, collaboration skills, meta-skills, and their contribution to the project.

There are opportunities to carry out formative assessment at various stages in the unit. For example, assessors could regularly check-in with groups, monitor progress against the project action plan and ensure all members are contributing. This will provide assessors with an opportunity to offer guidance or support where necessary.

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 SQA e-Assessment. (www.sqa.org.uk/Guide to best practice.pdf).

Opportunities for developing Core and other essential skills

This unit provides opportunities to develop Core Skills, particularly Working with Others (at SCQF level 6). Learners are required to work collaboratively in groups throughout the unit which will involve analysing roles and responsibilities, contributing effectively to the project, and promoting co-operative working with other members of the group.

Outcome 4 requires learners to evaluate their personal skills development using the meta-skills framework in the context of the IT industry.

In addition, this unit provides opportunities to develop Core Skills in Communication, Problem Solving, and Information and Communication Technology (ICT).

History of changes to unit

Version	Description of change	Date

General information for learners

Unit title: Computing Project (SCQF level 6)

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.

Working in the IT industry often involves complex technical challenges that require a diverse set of skills to design and implement innovative solutions. This is achieved by bringing individuals together to work collaboratively as a team to solve problems.

This unit aims to take your existing knowledge, skills and experience and apply them in new contexts whilst developing the skills required to be an effective team member in the IT industry.

You will be required to work collaboratively to develop a solution to a given project brief.

There are four parts to this unit. You will:

- contribute to a project plan from a project brief.
- contribute to the design of a solution.
- contribute to the development and testing of a solution.
- evaluate your contribution to the project.

The project will be based on an area of computing that you are familiar with, such as hardware, networking, programming, cyber security, data science, games design, esports, artificial intelligence, or emerging technologies. It will provide you with an opportunity to demonstrate the knowlege and skills you have already developed, as well as allow you to further develop key skills in planning, decision making, collaboration, communication, implementation, critical thinking, time management and testing.

Assessment is continuous throughout the unit and will involve gathering a portfolio of evidence to demonstrate your groups' progress through the project. It will also involve you individually reflecting on your development of meta-skills including strengths, weaknesses, achievements and areas for improvement. Employers value meta-skills and so it is important that you can effectively comunicate your strengths to be successful in the world of work.

When you complete this unit, you could progress onto HNC Computing or use the skills you have developed in another subject area.