## National Unit Specification

## General information

**Unit title:** Network Literacy (SCQF level 5)

**Unit code:** J6B7 45

**Superclass:** CB

**Publication date:** May 2022

**Source:** Scottish Qualifications Authority

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## Unit purpose

This unit is a non-specialist unit for those who wish to develop their knowledge and skills in using networks in a non-technical environment such as in the home and on the move. It aims to educate citizens in the productive, safe, and responsible use of current network technologies. Learners undertaking this unit will enhance their digital skills and become active participants in the networked society.

Network literacy relates to a range of 'hard' and 'soft' skills, and the underpinning knowledge and understanding. The 'hard' skills relate to technical competencies in using network client hardware such as computers, smart phones, and other connectable devices as well as an appreciation of the role of connectivity hardware such as routers and switches. The 'soft' skills relate to skills in using software to access and use network resources. At this level, learners' knowledge and skills are developed to an intermediate standard.

This unit will develop skills in using a range of network hardware and software. It also provides transferable skills so that learners can apply these skills to new technologies. It is suitable for learners who want to develop their digital skills in preparation for employment in areas where these skills are essential or to allow them to benefit from modern network resources in everyday use. Learners may also wish to participate in further studies in computer science and information technology.

On completion of this unit, learners will possess intermediate digital skills in using common network hardware and software and have an appreciation of their applications and implications for individuals and groups in society today.

## National Unit Specification: General information (continued)

**Unit title:** Network Literacy (SCQF level 5)

## Outcomes

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

1 Explain the importance of network use in society today.
2 Describe network security and contemporary cyber threats.
3 Implement practical networks.

## Credit points and level

1 National Unit credit at Scottish Credit and Qualifications Framework (SCQF) level 5:
(6 SCQF credit points at SCQF level 5).

## Recommended entry to the unit

Entry is at the discretion of the centre. It is recommended that the learner has achieved Network Literacy at SCQF level 4 or equivalent.

## Core Skills

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

Achievement of this Unit gives automatic certification of the following Core Skills component:

Core Skill component Accessing Information at SCQF level 5

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

## 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 may be offered stand-alone or as part of the National Progression Award in Digital Literacies at SCQF level 5. If offered as part of this group award, there may be opportunities to combine and integrate teaching and learning across units. There may also be opportunities to combine evidence requirements and integrate assessments.

## 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

## Unit title: Network Literacy (SCQF level 5)

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

Explain the importance of network use in society today.

### Performance criteria

(a) Describe the common uses of networks in learning, business, and leisure.
(b) Explain the value of different networks to society and the environment.
(c) Describe online rights and responsibilities relating to the safe use of networks.
(d) Describe the common services provided by networks.

## Outcome 2

Describe network security and contemporary cyber threats.

### Performance criteria

(a) Describe the consequences of poor network security on users.
(b) Describe current threats to networks and to using a network.
(c) Describe currently recommended methods to maintain network security.

## Outcome 3

Implement practical networks.

### Performance Criteria

(a) Describe the function of modern hardware and software components in a network.
(b) Connect devices to a wireless network securely.
(c) Build a small LAN for secure data sharing or gaming.
(d) Use a network service securely to communicate with individuals and groups.
(e) Use cloud data sharing facilities securely.

## National Unit Specification: Statement of standards (continued)

## Unit title: Network Literacy (SCQF level 5)

### 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. Assessors can best achieve this by concentrating on the most common and current technologies in use today.

Evidence is required to demonstrate that learners have achieved all outcomes and performance criteria. However, sampling may be used in certain circumstances where the sample is sufficiently random and robust to clearly infer competence in the full domain.

The evidence for this unit may be written or oral or a combination of these. Evidence may be captured, stored, and presented in a range of media (including audio and video) and formats (analogue and digital). Consideration should be given to digital formats and the use of multimedia. It is recommended that evidence is collected for the unit as a whole and is a naturally occurring by-product of teaching and learning. Holistic assessment (within and across outcomes) is encouraged where possible.

The gathered evidence must span a range of device types and network usage. To facilitate this, learners will carry out a range of practical activities using commonly encountered devices and network services. The hardware and software to be used is discretionary but must be current.

Evidence is required for two types of competence: evidence of cognitive competence (knowledge and understanding) and evidence of practical competence (practical abilities). In certain circumstances, the evidence of cognitive competence may be sampled; the sample must be sufficiently random and robust to clearly infer competence in the entire knowledge domain. For example, if a traditional test is used to assess a learner's knowledge and understanding, this test may sample across the knowledge domain; however, if a portfolio approach is taken then it would not be appropriate to sample, and evidence of every cognitive competence would be required. Evidence of practical competence cannot be sampled; however, the amount of evidence is left to the professional judgement of the assessor and should be the minimum compatible with the requirements of this unit. Evidence of practical competence should be produced over an extended period in open-book conditions, for example through completion of a manual or digital logbook, video diary or e-portfolio. Learners should have access to help files and notes as well as appropriate online resources. Assessor assistance should be limited to issues where the troubleshooting required is outwith the scope of the unit, for example where a computer fails to start up.

Evidence must be produced under controlled conditions; however, the amount of control will vary from context to context. For example, evidence of cognitive competence could take the form of a text which would permit highly controlled conditions (including close-book assessment). Alternatively, evidence could be generated using a weblog, written over an extended period at varying locations which would not permit such close control. In every case, assessment must be controlled to some extent. Where the amount of control is low, the amount of authentication should rise. It is not acceptable to produce evidence in lightly controlled conditions with little authentication.

Authentication may take various forms including, but not limited to, oral questioning and plagiarism checks. Some forms of evidence generation (such as video recordings) have intrinsic authentication and would require no further means of verification. Where evidence is not generated under closely controlled conditions (for example, out of class) then a statement of authenticity should be provided by learners to verify the work as their own and state any necessary sources and permissions. The Guide to Assessment provides further advice on methods of authentication.

Evidence for this unit should be generated naturally, as a by-product of teaching and learning, and integrated into as few assessment tasks as possible. The Guidance on approaches to assessment of this unit (in the National Unit support notes section of this specification) provides specific examples of instruments of assessment that seek to do this.

# National Unit Support Notes

## Unit title: Network Literacy (SCQF level 5)

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 general context for this unit is the 'Internet of Things' (IoT) — the idea that a wide range of devices can now be connected to the internet. Younger learners may not have experience of the pre-network age; more mature learners may not appreciate the scale of networking that is presently taking place; neither category may appreciate the effects of these changes at an individual, group, or societal level. Using historical context for each outcome may reinforce the scale of change currently taking place.

The purpose of this unit is to deliver intermediate knowledge and skills in the use of network resources and network devices. This unit is intended for non-specialists and should be delivered in that context.

Throughout the unit, the terminology used means specific things. The phrase 'network hardware' refers to the infrastructure components used in networking such as routers and switches, as well as the client devices such as computers and smartphones, etc used to connect. The phrase 'network software' refers to software used on these client devices to facilitate usage of the network services for example, e-mail clients or web browsers. Finally, 'network services' refers to the reason the network is being used, for example e-mail, web browsing, social media, etc.

At this level (SCQF level 5) treatment of every topic should be straight-forward, without too many technical complexities. Learners should not need to understand anything beyond what is necessary to use the technology comfortably.

It is important that the more subjective topics (such as the use of networking services over more traditional methods to achieve the same thing) are presented in a balanced and objective manner, neither over-emphasising the advantages nor disadvantages. It should be left to the learner to decide if the benefits outweigh the actual (or potential) drawbacks.

**Outcome 1**: This outcome is designed to provide an understanding of the importance of modern network services and effects they have in everyday life.

Performance criterion (a) enables learners to explain how networks are used in the domains of learning, business, and leisure. This should include the gaining of employability skills and performing self-improvement.

## National Unit Support Notes (continued)

## Unit title: Network Literacy (SCQF level 5)

To allow learners to appreciate the wide scope of modern network services, they should be given a variety of modern examples of networks used in social media; online meetings; e-commerce; job sites; online storage; chat rooms and weblogs.

Performance criterion (b) enables learners to describe the value different networks provide in society today. They should be able to describe the difference between a Local Area Network (LAN) and a Wide Area Network (WAN) as well as how these can be used in a business environment. They should also be able to describe how a LAN can be used in the home.

Learners should explain the advantages and disadvantages of networking over more traditional methods for example. online versus physical meetings; e-mail versus traditional correspondence, online shopping versus traditional shopping; resource sharing versus using multiple resources. The environmental impact of these comparisons should also be considered.

Performance criterion (c) provides learners with an understanding of their online rights and responsibilities. They should be aware that libel and slander laws still apply when communicating using networks and that copyright laws also apply when using available resources. Learners should understand the need to maintain professionalism online (netiquette) as well as the implications of the computer misuse act.

The treatment of online rights and responsibilities should be straight-forward. It is important to discuss this topic in a balanced and objective manner, neither over-emphasising threats nor opportunities. At this level, learners may have little grasp of their online rights or responsibilities. Young learners may be unaware of fundamental aspects of network systems such as their potential to easily copy and share comments and media (such as photographs), which are subject to the same legal constraints as other publishing media.

Learners are expected to simply state the basic legal requirements that constrain their use of network systems as part of this performance criterion. There is an opportunity here, particularly for young learners, to discuss issues such as cyberbullying and online safety. Learners' rights to privacy, or lack thereof, would be an important part of this outcome.

At this level it is sufficient to explain these in functional, rather than legalistic, language.

Performance criterion (d) should provide learners with the ability to describe common network services in current use. At the time of writing these include services such as e-mail, file sharing, online gaming, the world wide web, video on demand, video conferencing and any new technologies that become popular.

At this level, the recommended pedagogy should combine assessor-led tuition with learner-centred discovery. It is likely that assessors will have to provide introductory knowledge and skills before learners are able to commence self-learning. Peer learning should be possible and encouraged. A wide range of online resources are available that cover most of the knowledge involved in this unit. However, in most cases, learners will need an introduction before being expected to learn in this way.

## National Unit Support Notes (continued)

### Unit title: Network Literacy (SCQF level 5)

The descriptions and explanations should be high level and straight-forward, avoiding technical complexity whenever possible. However, an important part of this outcome is that learners develop their technical vocabulary. Learners must use terminology correctly and in context and should be encouraged to use the appropriate terminology at every opportunity. Only routine descriptions are required. For example, the description of network services should be little more than names and brief functionality, however learners should, where possible, gain experience of their use to provide practical experience and enhance understanding. This can be combined as part of outcome 3.

**Outcome 2**: This outcome is designed to provide learners with an awareness of the common dangers when using networks and the need for network security.

Performance criterion (a) raises learners' awareness of the consequences of not employing correct network security. They should be taught about the consequences of personal data theft (credit cards, passwords, etc) and how these can affect people financially and personally through user profiling, identity fraud, etc. The descriptions of data theft should be straight-forward, but learners should be given the opportunity to explore the consequences at length.

At this level, learners may not appreciate the importance of network security either for themselves or network systems, and case studies could be used to illustrate why security is needed. Data security is becoming an important issue (with growing job prospects). The value of data, hence the importance of cyber security may need to be carefully explained.

Performance criterion (b) enables learners to become aware of the common threat vectors used to undermine network security. Learners should become aware of any contemporary methods. At the time of writing, examples include denial of service, man-in-the-middle, backdoors, keyloggers, spam, phishing, general malware and common online scams.

Performance criterion (c) enables learners to become aware of the common techniques for mitigating security breaches. Learners should be introduced to contemporary methods. At the time of writing, examples include firewalls; anti-virus; user training; anti-malware; secure passwords; digital certificates; strong social media settings; wi-fi security and software updates.

Although the underlying theory of performance criteria (b) and (c) are outside the scope of this unit, for criterion (b) learners should be made aware of what each threat is and why it is used. It is not important for learners to know how the threat works at a technical level. Similarly, for performance criterion (c) each method should be explained in terms of which threats it mitigates and not how it achieves it. For example, learners should understand that a denial of service prevents access to a network resource and that a firewall can be configured to prevent this. Details of how the firewall does this are not relevant to the unit. This will ensure a coherent approach to the learning of threat-types and threat-mitigation is maintained.

## National Unit Support Notes (continued)

### Unit title: Network Literacy (SCQF level 5)

**Outcome 3**: This outcome is designed to show learners how to connect to common network services.

Performance criterion (a) introduces learners to the purpose of networking infrastructure in current use. The most common of these is the router but they should also be made aware of switches and access points, as well as client devices such as computers, tablets, and laptops. Less traditional network clients such as smart televisions, smart phones, home security devices, digital home exercise machines, gaming consoles, etc could be included. A discussion of network internet protocol (IP) should only be of sufficient depth to allow learners to understand its purpose in connecting to a network. This guidance should not be treated as exhaustive and any additional currently used hardware should be considered.

Performance criterion (b)–(e) are practical exercises to supplement the learning of earlier theory.

Performance criterion (b) allows learners to understand how to connect client devices to wireless networks. They should use at least two devices to see the similarities in the process for each device. While an in-depth understanding of many of the settings is beyond the scope of the unit, learners should be aware of the purpose of the Service Set Identifier (SSID, - network name - and encryption / password settings.

Performance criterion (c) allows learners to set up a small local area network of multiple computers. They could do this to facilitate a resource, (for example file / printer) sharing or to set up a network game.

Performance criterion (d) allows learners to set up an online communications network to host a chat or online meeting.

Performance criterion (e) allows learners to store and share data in a cloud-based storage facility.

Throughout all practical activities, learners should ensure they maintain appropriate security considerations and use the network responsibly.

## Guidance on approaches to delivery of this unit

A practical, hands-on approach to learning should be adopted to engage learners and exemplify key concepts. However, all practical activities should be underpinned with appropriate knowledge before learners commence these activities. Outcome 3 is designed to complement the teaching of outcomes 1 and 2. Teaching should be delivered so that learners acquire transferable skills and should not overly focus on a single network device or network system.

To facilitate the practical parts of the unit, learners will require administrator access to various wireless client devices including a wireless-enabled computer and different portable devices. Access to a wireless router or access point will also be necessary. If permitted, existing wireless infrastructure could be used since no configuration of these devices will be necessary. Network software may also be useful.

Learners will also require access to the internet to access various services. This does not need to involve any wireless connectivity.

At this level, it is expected that learning will be a mix of assessor-led and self- or peer-learning. New concepts should be introduced by the assessor. Self- or peer-learning should be carefully devised and monitored. Opportunities should be taken to motivate learners using engaging technology such as multimedia, (for example music and video), social media (social networks and blogs) and computer games, and competences delivered in that context (for example, through online music services, such as Spotify™, that permit network sharing and collaboration).

The distribution of time over the three outcomes is at the discretion of the centre and thus will be influenced by several factors such as the actual technologies utilised. However, to emphasise the need for a learn by doing approach, a possible distribution is as follows:

- Outcome 1: 12 hours.
- Outcome 2: 12 hours.
- Outcome 3: 16 hours.

Throughout this unit learning activities should relate to the personal or vocational interests of learners, and they should be encouraged to become confident with as wide a range of network services as possible.

## 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 for 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.

A traditional approach to assessment would involve the testing of knowledge through a closed-book selected response test spanning outcomes 1, 2 and 3 performance criterion (a).

It is recommended that if this approach is adopted then all the knowledge and understanding in this unit is combined into a single test that samples from the knowledge domain, with an appropriate pass mark.

The remaining practical competencies (outcomes 3 (b)–(e)) could be assessed through observation of learner activity throughout the duration of the unit and recorded on an observation checklist or through the completion of a logbook containing appropriate screenshots, photographs, or other digital artefacts as evidence.

Another approach to assessment would be for learners to create and maintain a web log. This would record, on a daily or weekly basis, what learners learn and what they do, with each post satisfying the related performance criteria. So, for example, the post relating to outcome 1, performance criterion (a), would have to provide an adequate description of how networks are used in learning, business, and leisure.

Practical activities could also be recorded via the blog. For example, the post relating to outcome 3, performance criterion (b), would describe how a network connection was made and secured.

When practical activity is recorded on a blog, authentication could involve a photograph or video of learning activity or a screenshot illustrating the criterion (such as a screen shot of a smartphone's security settings). Not every practical task would require authentication — at this level it is acceptable for some posts to be a simple description of appropriate practical activities. When necessary, separate authentication (such as oral questioning) could be used for verification purposes. The critical aspect is that the blog is an overall accurate reflection of the practical activities (and, therefore, the associated skills) obtained out by the learner during the completion of the unit.

Another approach would involve the creation and maintenance of an e-portfolio. The e-portfolio would include all the descriptions and explanations necessary to satisfy the criteria relating to cognitive competencies (in this case, there is no justification for sampling), together with digital artefacts that provide evidence of their practical abilities. The latter (digital artefacts) would include screenshots, digital images, digital audio, and video recordings, etc. that collectively evidence learners' practical competencies. Some form of authentication would be required for a significant proportion of the gathered items, but this could be as simple as a statement of originality, signed by the learner, and counter-signed by the assessor, or a digital audio recording of a brief question-and-answer session between the learner and the assessor.

## 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 that 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**.

## National Unit Support Notes (continued)

**Unit title:** Network Literacy (SCQF level 5)

## Opportunities for developing Core and other essential skills

The Accessing Information component of Information and Communication Technology at SCQF level 5 is embedded in this unit. When a learner achieves the unit, their Core Skills profile will also be updated to include this component.

This unit provides opportunities to deliver aspects of the following Core Skills at SCQF level 5:

- Communication
- Information and Communication Technology (ICT)
- Problem Solving

In addition to Core Skills, this unit provides opportunities for learners to develop enterprise, employability, and citizenship skills, and improve their digital literacy due to the variety of software that they may use.

## History of changes to unit

**Unit title:** Network Literacy (SCQF level 5)

| Version | Description of change | Date |
|---|---|---|
| 02 | Core Skills Component Accessing Information at SCQF level 5 embedded. | 06/09/22 |
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# General information for learners

## Unit title: Network Literacy (SCQF level 5)

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 aims to educate you in the importance, responsible and secure use of modern networks in a variety of common ways.

You are expected to have some basic awareness of networks before undertaking this unit. The unit covers important knowledge and skills about the secure and responsible use of networking in everyday life. After completing the unit, you will be able to confidently use networks daily for personal, learning or business purposes.

The unit covers a wide range of knowledge and skills including:

- The common uses of networking in society for learning, commerce, and leisure.
- The value of networking in society for learning, commerce, and leisure.
- The need to use a network correctly and responsibly.
- The range of common services provided by networks in common use today.
- The need to ensure networks are secure and the consequences of not doing so.
- The common threats that networks and users face and how they can be mitigated.
- The function of common networking hardware and software.
- How to build a small local area network.
- How to connect safely to a wireless network.
- How to communicate with individuals and groups securely.
- How to perform data sharing using cloud technologies.

This unit is designed for learners with some previous experience of networks who want to develop their existing skills to make them more effective users. It is particularly suitable for those who need to learn about networking to allow them to participate in modern society.

To pass the unit, you will be asked to complete and assessment. The assessment may take different forms. It will be straight-forward and not take much time away from your learning. It may involve a short test of your knowledge and some practical tasks, or it may simply be a record of your activities during the unit. But the focus of the unit is on learning and gaining practical experience, not assessment.

A key goal of this unit is to teach you to be a knowledgeable, responsible, and active user of digital technologies so that you can confidently use networks for personal, social, educational or community purposes.

On completion of this unit, you will be able to use smartphones, tablets, PCs, and other digital devices for a wide range of personal and social purposes, including accessing and using a variety of internet services.

This unit will provide you with the opportunity to develop aspects of the Core Skills of Communication, Information and Communication Technology (ICT) and Problem Solving at SCQF level 5.

## General information for learners (continued)

**Unit title:** Network Literacy (SCQF level 5)

This unit is part of a series of units on network literacy. You may progress to the next unit in the series (Network Literacy at SCQF level 6) on completion of this unit if you wish to improve your knowledge and skills in this area.

The Accessing Information component of Information and Communication Technology at SCQF level 5 is embedded in this unit. When you achieve the unit, your Core Skills profile will also be updated to include this component.