

## National Unit specification: general information



**Unit** Computing: Networked Small Office/Home Office

**Unit code:** FY9N 12

**Superclass:** CB

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**Version:** 01

### Summary

This Unit enables candidates to set up a small computer networked office. Candidates will also apply an appropriate methodology and select tools to test and troubleshoot a networked small office/home office. The Unit will provide candidates with information about the different types and features of networking components and the physical components required to build a small office/home office network. Candidates will be made aware of the need for standards and protocols in computer networks, the Transmission Control Protocol/Internet Protocol (TCP/IP) networking model and its components.

This is an optional Unit in the National Certificate in Computing: Technical Support (SCQF level 6) but is also available as a free-standing Unit.

The Unit is suitable for candidates who have an interest in computer networks or who are undertaking a course of study in a computing related field.

### Outcomes

- 1 Describe the physical requirements for a small office/home office network.
- 2 Design a small office/home office network to a given brief.
- 3 Implement and test a small office/home office network to a given brief.

### Recommended entry

While entry to this Unit is at the discretion of the centre, prior experience of computer networks would be beneficial.

## **National Unit specification: general information (cont)**

**Unit title:** Computing: Networked Small Office/Home Office

### **Credit points and level**

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

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

### **Core Skills**

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes of this Unit specification.

There is no automatic certification of Core Skills or Core Skill component in this Unit.

## **National Unit specification: statement of standards**

### **Unit            Networked Small Office/Home Office**

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 the physical requirements for a small office/home office network.

#### **Performance Criteria**

- (a) Describe computer network concepts for a small office/home office.
- (b) Describe the hardware requirements for a small office/home office network.
- (c) Describe computer peripherals and devices for a small office/home office network.

#### **Outcome 2**

Design a small office/home office network to a given brief.

#### **Performance Criteria**

- (a) Produce a diagram outlining the design that meets the requirements of the given brief.
- (b) Annotate the diagram using a suitable naming convention for the network.

#### **Outcome 3**

Implement and test a small office/home office network to a given brief.

#### **Performance Criteria**

- (a) Select the components necessary to build the network to meet the given brief.
- (b) Build the network as described in the annotated network diagram(s) to meet the given brief.
- (c) Test all components of the network.
- (d) Detail the building and testing process.

## **National Unit specification: statement of standards (cont)**

**Unit**            Networked Small Office/Home Office

### **Evidence Requirements for this Unit**

Evidence is required to demonstrate that candidates meet the requirements of all the Outcomes and Performance Criteria.

#### **Outcome 1**

Written and/or oral recorded evidence is required that demonstrates that candidates can:

- ♦ describe at least five networking concepts that relate to a small office/home office network.
- ♦ describe the types and purpose of at least five different pieces of network hardware.
- ♦ describe the types of and security settings for a wireless connection.
- ♦ describe types and purpose of at least five different pieces of network peripheral devices.

The evidence for this Outcome should be obtained under controlled, supervised, closed-book conditions.

#### **Outcome 2**

Written and/or oral recorded evidence is required that demonstrates that candidates can:

- ♦ produce a diagram outlining the design that meets the requirements of the given brief including: an internet connection, an Ethernet router with wireless capability, internet based communications software, a minimum of two nodes, file sharing, a backup device and a shared peripheral device.
- ♦ the diagram must be annotated using a suitable naming convention for the network.

The evidence for this Outcome should be obtained under controlled, supervised, open-book conditions. Candidates will have access to notes, reference work and online material.

## **National Unit specification: statement of standards (cont)**

**Unit**            Networked Small Office/Home Office

### **Outcome 3**

Product evidence is required that demonstrates that candidates can:

- ♦ select the necessary components according to the requirements of the given brief.
- ♦ build and test a small computer network of at least two nodes with a backup device and a shared peripheral device suitable for use in a small office/home office with suitable security settings and protocols enabled and communications software properly installed and tested.

Testing will show that both nodes can ping each other, that both nodes can access the shared device and that both nodes can communicate using internet based communications software. It will also show that wireless security settings are enabled and operating. Detail of the building and testing process will include the steps taken in assembling, configuring and testing the network.

The evidence for this Outcome should be obtained under controlled, supervised, open-book conditions. Candidates will have access to notes, reference work and online material.

## National Unit specification: support notes

### Unit title: Computing: Networked Small Office/Home Office

This part of the Unit specification is offered as guidance. The support notes 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 aligns to the following National Occupational Standards (NOS) from eskillsUK:

- ◆ OSP: Optimise IT system performance

Delivery of this Unit may alter depending on the technology and equipment available.

The overall aim of this Unit is to enable candidates to set up a small office/home office network. The Unit will provide candidates with information about the different types and features of networking equipment, cabling and the physical network topologies. The candidate will also be made aware of the TCP/IP networking model and its components. Throughout the Unit the candidate should be exposed to common networking terminology and concepts.

Likely uses of a small office/home office network could be:

- ◆ Small businesses operating on business premises with a few users who have a need to share resources without the need for a server.
- ◆ Home-based businesses.
- ◆ Employees from larger organisations who are working from home.

All would have a need to share resources, and a need for data security and integrity.

### Outcome 1

This Outcome relates to identifying key networking terminology and networking hardware and media. The candidate should be made aware of common physical network topologies used in a small office/home office and their features. The candidate will have to recognise the basic elements of the TCP/IP networking model and its components.

The candidate will be required to know network concepts and terminology that relate to a small office/home office: Network Interface Card (NIC) including wireless NICs, topology, MAC (Media Access Control) Address and IP (Internet Protocol) Address. Candidates will be required to recognise the appropriate network devices used by a small office/home office such as routers and switches. Candidates will also have to be aware of physical (MAC) and logical (IP) addressing and be able to identify each type.

The Outcome also involves the identification and recognition of common physical networking topologies used in a small office/home office, including star, hierarchical and mesh. Candidates will have to recognise each topology and their features and learn the advantages and disadvantages of using each topology.

## **National Unit specification: support notes (cont)**

### **Unit title:** Computing: Networked Small Office/Home Office

The identification of the types and features of networking equipment will include: network cards (including wireless), hubs, switches, routers and wireless access points.

#### **Outcome 2**

This Outcome relates to the planning for the small office/home office network. Planning of the small office/home office will involve detailing the networking equipment required for the successful implementation of the network. File sharing, backup storage and a shared peripheral must be included in the design.

The planning of the small office/home office will involve the candidate in choosing the equipment and cabling for a small office/home office network. The physical layout should also be considered in terms of the relative placement of the components. The candidate will use wired and wireless connections.

The candidate must choose suitable internet based communications software.

Candidates will be required to be able to recommend an Internet Service Provider (ISP) and recommend how a small office/home office can connect to the internet identifying connection options and speeds.

#### **Outcome 3**

This Outcome relates to the configuration and testing of a small office/home office computer network. Candidates will use appropriate software to configure the computers on the network to meet the requirements of the network, eg peer to peer or client/server. Candidates should be encouraged to troubleshoot and repair faulty networks and keep accurate and up-to-date records of the troubleshooting process. Problems encountered could include hardware, wireless settings, cabling or incorrect configuration.

Candidates will establish correct connections between the different nodes on the network and test these by transferring data across the network using file sharing. Candidates should test using key commands such as ping and ipconfig. The candidate should also test any peripheral components such as printers from each node on the network. Testing will show that both nodes can ping each other, share test files and that both nodes can access the shared device. If this was a printer then both nodes would print a test page.

Candidates will test and correctly configure wireless settings and demonstrate the use of communications software.

### **Guidance on learning and teaching approaches for 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 candidates commence these activities.

## National Unit specification: support notes (cont)

### Unit title: Computing: Networked Small Office/Home Office

It is recommended that candidates gain hands-on installation and configuration experience of at least one of each type of cabling and network components. While teaching will necessarily focus on specific products, the generic features of the hardware should be emphasised. Candidates could work in groups when practising the assembling and testing of the small office/home office computer network.

### Guidance on approaches to assessment for this Unit

An integrative approach may be taken with the three Outcomes being assessed through two instruments of assessment. The first instrument of assessment would cover Outcome 1 and the second instrument of assessment Outcomes 2 and 3.

The assessment for Outcome 1 could take the form of an objective test consisting of 20 questions to cover at least five networking terms and concepts that relate to a small office/home office and covering all of the Performance Criteria. It is anticipated that this assessment will be carried out towards the end of the Unit to allow the candidate to consolidate the knowledge in a practical context. The assessment will be under supervised, controlled and closed-book conditions and should be attempted on a single occasion.

Candidates could be given a project to build a functional computer network and this could integrate Outcomes 2 and 3. Candidates should maintain an activity log over an extended period of time which can be used to detail steps taken.

The activity log will provide evidence that the candidate can correctly create the network cables and select the correct hardware and software to set up a small office/network of at least two computers. The activity log will also provide evidence of network troubleshooting, including the correction and recording of network problems. The candidate's activity log and assessor's observation checklist must be authenticated by the assessor, who must confirm that these are an accurate record of candidate activity.

### Opportunities for the use of 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 e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

If a centre is presenting Outcome 1 of these assessments online the following assessment methods, where appropriate, may be selected:

- ◆ Multiple choice
- ◆ Drag and drop
- ◆ Multiple response
- ◆ Mix and match

Or a combination of the above.



## **National Unit specification: support notes (cont)**

**Unit title:** Computing: Networked Small Office/Home Office

### **Opportunities for developing Core Skills**

In this Unit candidates will develop skills in setting-up small networked computer systems.

- ◆ Candidates will: describe computer network terminology, hardware and media.
- ◆ Describe computer network concepts and topologies that relate to small networked computer systems including their features, advantages and disadvantages.
- ◆ Describe the basic elements of the TCP/IP networking model and its components and the need for logical networking models.
- ◆ Produce a plan for the preparation, creation, implementation and testing of a small office/home office which identifies equipment, cabling and physical layout.
- ◆ Install a small office/home office with wireless capabilities and appropriate wireless security settings.
- ◆ Select appropriate equipment and configure the small office/home office.
- ◆ Select appropriate networking diagnostic tools to test and diagnose network problems.

This means that as candidates are doing this Unit they will be developing aspects of the Core Skills of *Communication, Problem Solving* and *Information and Communication Technology (ICT)*.

### **Disabled candidates and/or those with additional support needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements)

## History of changes to Unit

Version	Description of change	Date

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