



Group Award Specification for:

National Progression Award (NPA) in Computing Technologies at SCQF level 4

Group Award Code: GV6W 44

National Progression Award (NPA) in Computing Technologies at SCQF level 5

Group Award Code: GV6W 45

National Progression Award (NPA) in Computing Technologies at SCQF level 6

Group Award Code: completed GV6W 46

Validation date: June 2024

Date of original publication: October 2024

Version: 01

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1 Introduction

The purpose of this document is to:

- Assist centres to implement, deliver and manage the qualification.
- Provide a guide for new staff involved in offering the qualification.
- Inform course managers teaching staff, assessors, learners, employers and higher education institutes (HEIs) of the aims and purpose of the qualification.
- Provide details of the range of learners the qualification is suitable for and progression opportunities.

A wide range of vocational qualifications in computing are available to centres including:

- Award in Internet Safety (SCQF level 4)
- National Progression Award in Computer Games Development (SCQF level 5)
- National Certificate in Computing with Digital Media (SCQF level 6)
- Higher National Certification in Computing (SCQF level 7)
- Higher National Diploma in Cyber Security (SCQF level 8)
- Professional Development Award in Data Science (SCQF level 9).

National Progression Awards (NPAs) are well-established vocational qualifications, popular in schools and colleges. NPAs are widely used for progression to further studies and, to a lesser extent, employment. A range of specialist NPAs are currently available to centres, including:

- National Progression Award in Computer Games Development
- National Progression Award in Cyber Security
- National Progression Award in Data Science
- National Progression Award in Esports.

SQA consulted with centres in Autumn 2023 about the prospect of developing a less specialised, more general NPA in computing. Over 200 representatives responded to the survey, with more than 90% of respondents supporting the development of a broad-based vocational qualification in computing. A subsequent business case was approved in September 2023.

A Qualification Development Team (QDT) was formed in October 2023, comprising 15 representatives of schools, colleges, training centres, employers and national bodies; a practicing teacher was appointed as lead developer, who carried out further consultation with stakeholders. This qualification is the product of the work of the lead developer and the QDT.

The qualification is designed to be a broad-based introduction to computing technologies. There is no specific focus, permitting learners to choose from a wide range of computing topics. The title reflects this.

The qualification is available at three levels: SCQF level 4, SCQF level 5 and SCQF level 6, in keeping with other NPAs, which are similarly offered at three levels.

The structure of the qualification (see section 2) is consistent from level to level, permitting learners to move between levels, and facilitates multi-level teaching. This approach has proven popular with similar qualifications.

The size of the qualification (4 SQA credits / 24 SCQF points) provides the same credit value as National Qualifications at the same level, and is compatible with timetabling requirements in Scottish schools and colleges. Three credits are taught and one credit is project-based.

The qualification, at each level, comprises three components:

Component 1: Foundation knowledge (1 credit)

Component 2: Project (1 credit)

Component 3: Options (2 credits)

Computing changes quickly as technology evolves. But the core knowledge and concepts are more stable. Component 1 helps learners understand the basic principles of computer systems so they can apply that knowledge to new technologies as they arise.

A wide range of options are available to permit learners to select those options of most relevance to their academic and vocational goals. The options include:

- artificial intelligence
- computer networks
- computer programming
- data security
- data science
- emerging digital technologies
- esports

Careful selection of optional units will permit learners to progress to more specialised qualifications. For example, learners who select Data Science could progress to NPA Data Science; learners who select Data Security could progress to NPA Cyber Security.

An important progression path from this qualification (at Level 6) is HNC Computing. It is anticipated that many colleges will include this qualification in their non-advanced programmes to facilitate this pathway.

Schools may wish to offer this qualification as an alternative to, or alongside, National Qualifications in Computing Science. The qualification has been designed to be complimentary to National Qualifications, providing a different emphasis and broader base.

2 Qualification structure

2.1 Structure

The award is available at SCQF levels 4,5 and 6.

Each award consists of two mandatory units and nine optional units, from which learners must select two. The total credit value of each award is 4 SQA credits (24 SCQF credit points). Teaching, learning and assessment time is 160 hours.

The suite of awards is identical from level to level.

SCQF level 4 — Mandatory units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8DW	44	Computing Foundations	1	6	4
J8DY	44	Computing Project	1	6	4

Table 1

Optional units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8E0	44	Artificial Intelligence	1	6	4
HX9X	44	Computer Games: Development	1	6	4
F1K2	10	Computer Hardware and Systems	1	6	4
J8E1	44	Computer Network Fundamentals	1	6	4
HY2C	44	Computer Programming	1	6	4
J2G2	44	Data Science	1	6	4
H9E2	44	Data Security	1	6	4
J8E2	44	Emerging Digital Technologies	1	6	4
J73W	44	Esports: Game Performance	1	6	4

Table 2

SCQF level 5 — Mandatory units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8DW	45	Computing Foundations	1	6	5
J8DY	45	Computing Project	1	6	5

Table 3

Optional units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8E0	45	Artificial Intelligence	1	6	5
HX9X	45	Computer Games: Development	1	6	5
F1KR	11	Computer Hardware and Systems	1	6	5
J519	45	Computer Network Fundamentals	1	6	5
HY2C	45	Computer Programming	1	6	5
J2G2	45	Data Science	1	6	5
H9E2	45	Data Security	1	6	5
J8E2	45	Emerging Digital Technologies	1	6	5
J740	45	Esports: Game Performance	1	6	5

Table 4

SCQF level 6 — Mandatory units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8DW	46	Computing Foundations	1	6	6
J8DY	46	Computing Project	1	6	6

Table 5

Optional units:

4 code	2 code	Unit title	SQA credit	SCQF credit points	SCQF level
J8E0	46	Artificial Intelligence	1	6	6
HX9X	46	Computer Games: Development	1	6	6
F3SY	12	Computer Hardware and Systems	1	6	6
J8E1	46	Computer Network Fundamentals	1	6	6
HY2C	46	Computer Programming	1	6	6
J2G2	46	Data Science	1	6	6
H9E2	46	Data Security	1	6	6
J8E2	46	Emerging Digital Technologies	1	6	6
J744	46	Esports: Game Performance	1	6	6

Table 6

Detailed unit specifications are available on the SQA website ([Society of Quality Assurance](http://www.sqa.org)). www.sqa.org.

This is a practical qualification, with the emphasis on practical competences. Computing Foundations is designed to develop underpinning knowledge to ensure that learners are able to transfer their knowledge and skills to new technologies. The Project unit provides learners with the opportunity to apply their knowledge and skills to a wide range of practical activities. The optional units are a mix of knowledge and skills; their assessment involves the application of knowledge in a practical context.

2.2 Unit contents

This section provides summary details about each unit.

Unit title: Computing Foundations

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide learners with a broad overview of fundamental computing concepts. It is designed to give learners a summary of each key area, rather than an in-depth understanding of each one. The unit focuses on essential knowledge and understanding required as a foundation for further study. It is assumed that learners have basic computer literacy and familiarity with common digital devices.</p> <p>Learners will develop a basic understanding of key areas in computer organisation, logical operators, data storage, operating systems, networking, data science, and emerging technologies including artificial intelligence.</p> <p>This unit is intended for all learners. No previous knowledge or experience is required. It is particularly relevant to learners with a vocational interest in computing and information technology (IT).</p> <p>On completion of this unit, learners will be well-prepared to progress to more complex computing units. The broad understanding gained in this unit establishes a basis for further academic study.</p> <p>Learners may wish to progress to J8DW 45 Computing Foundations at SCQF level 5.</p>	<ol style="list-style-type: none"> 1. Demonstrate knowledge and understanding of computer hardware and systems. 2. Describe simple computer programs. 3. Demonstrate knowledge and understanding of computer networks. 4. State the significance of data in today's society. 5. State emerging digital technologies in society.

Evidence:

Knowledge: Yes

Product: No

Performance: No

Unit title: Computing Project

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to apply learners' existing knowledge and skills in a practical context, and develop the essential skills required to be an effective member of a team.</p> <p>The unit is suitable for learners with 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 skills in planning, collaboration, communication, and team working.</p> <p>Learners are required to produce a solution to a given project brief. The project brief will require learners to solve a simple 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.</p> <p>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.</p> <p>Learners may wish to progress to J8DY 45 Computing: Project at SCQF level 5.</p>	<ol style="list-style-type: none">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. Describe their contribution to the project.

Evidence:		
Knowledge: No	Product: Yes	Performance: Yes

Unit title: Artificial Intelligence

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to introduce learners to the basics of Artificial Intelligence (AI). This unit focuses on fundamentals, including the history, applications and ethical issues relating to AI. This unit is designed for individuals with a general interest in AI. No previous knowledge or experience of AI is required. This unit is suitable for all learners.</p> <p>The unit covers the fundamental concepts of AI, its applications in various contexts, and potential risks of misuse. Learners will explore different types of AI and the technologies behind them, such as Machine Learning and Large Language Models. Additionally, they will develop practical skills in training and testing simple models.</p> <p>On completion of this unit, learners will possess a basic understanding of the field of Artificial Intelligence including terminology, historical roots, practical applications, and ethical implications.</p> <p>Learners could progress to J8E0 45 Artificial Intelligence at SCQF level 5.</p>	<ol style="list-style-type: none">1. Identify the key stages in the development of Artificial Intelligence.2. Describe the applications of Artificial Intelligence.3. Describe ethical issues relating to the use of Artificial Intelligence.4. Train and test a simple AI model.

Evidence:

Knowledge: Yes

Product: Yes

Performance: No

Unit title: Computer Games: Development

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to allow learners to gain foundational knowledge and acquire skills in developing a basic computer game using a game development tool. It is an introductory unit suitable for all learners. No prior knowledge or experience is required. This is a non-specialist unit, intended for a wide range of learners who may continue into further study of computer games or pursue a career in the computer games industry. The unit covers the following knowledge and skills:</p> <ul style="list-style-type: none">• Constructing a working computer game• Importing the media assets• Following a design to create a working game• Evaluating and testing the completed game <p>On completion of this unit, learners will be able to implement the design for a working computer game and evaluate the effectiveness of the final solution produced. On completion of this unit, learners may wish to deepen their knowledge of computer games development by completing HX9X 45 Computer Games: Development at level 5, or progress onto the NC Computer Games Development.</p>	<ol style="list-style-type: none">1. Create a working computer game.2. Test the computer game.3. Evaluate the computer game.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Computer Hardware and Systems

Level: 4

Credit value: 1

Purpose	Outcomes
<p>This unit is designed to introduce learners to the basic concepts of computer structure. Learners will learn how to install a piece of hardware and a software package onto a computer system. Learners will also develop an understanding of operating systems and different types of peripherals. Learners will learn about safety procedures necessary when installing computer hardware. As the unit introduces learners to the basic hardware and software concepts of a computer system, it is a suitable foundation Unit for a wide range of computing based qualifications.</p>	<ol style="list-style-type: none">1. Identify the components of a computer system.2. Identify safety procedures.3. Install a hardware component in a computer system.4. Install a software package on a computer system.

Evidence:		
Knowledge: Yes	Product: No	Performance: No

Unit title: Computer Network Fundamentals

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to the foundation theoretical characteristics and practical elements that comprise small computer networks, as well as associated security considerations, in the context of a home network or small office scenario.</p> <p>This is a non-specialist introductory unit intended for learners with an interest in computer networking. This is an optional within the National Progression Award in Computing Technologies at SCQF level 4. It may also be delivered on a stand-alone basis.</p> <p>Learners will cover the fundamental concepts of computer networking, the types of devices that are part of a network, and how to install, configure and troubleshoot a small network. Learners will also learn about the maintenance and security aspects associated with simple networks.</p> <p>Upon completion of this unit, learners can progress to more advanced networking courses such as J519 45 Computer Network Fundamentals level 5 or explore related topics such as cyber security. The foundational knowledge and skills acquired in this unit will serve as a stepping stone for further exploration in the broader field of networking and technology.</p> <p>On completion of this unit, learners may progress to J519 45 Computer Networking Fundamentals at SCQF level 5.</p>	<ol style="list-style-type: none">1. Describe the features of computer networks.2. Describe threats to network security.3. Describe the components of computer networks.4. Maintain a small computer network.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Computer Programming

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide foundational programming skills and a basic knowledge of the principles of computer programming.</p> <p>This is a non-specialist unit, suitable for a wide range of learners. It is suitable for learners who require an introduction to coding for vocational purposes, and for learners who wish to appreciate programming for academic or personal reasons. No previous programming experience is required.</p> <p>Learners will gain a range of practical skills and acquire relevant underpinning knowledge. They will learn how to write code in a contemporary high-level language and appreciate basic programming concepts and techniques, and develop their computational thinking skills. On completion of this unit, learners will know how to write simple programs to solve real-world problems.</p> <p>Learners will be able to apply foundational programming concepts by implementing them in a programming environment. Learners may progress to HY2C 45 Computer Programming at SCQF level 5.</p>	<ol style="list-style-type: none">1. Write an algorithm to represent the solution to a simple problem.2. Describe basic programming concepts.3. Write a simple computer program.

Evidence:		
Knowledge: No	Product: Yes	Performance: No

Unit title: Data Science

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to the basics of data science. The unit focuses on the fundamentals of data science including what it is, how it is used, and how to apply it to small datasets. No previous knowledge or experience of data science is required. However, computational and numerical competency is presumed.</p> <p>This is a non-specialist unit, suitable for all learners. The unit introduces the basic ideas behind data science, what it is used for, including how it might be misused, basic skills in analysing small datasets, and presenting information in a variety of simple visual formats. Statistical methods are introduced in context. The unit will permit learners to gain a familiarity with this emerging field, and improve their appreciation of the growing importance of data science.</p> <p>At the completion of this unit, learners will understand the basics of data science and the importance of data in the world today, and be able to manipulate and interpret small datasets.</p> <p>Learners may wish to undertake this unit alongside J2HN 44 Data Citizenship at SCQF level 4 or progress to more advanced units in this field such as J2G2 45 Data Science at SCQF level 5, which will develop the knowledge and skills gained by undertaking this unit.</p>	<ol style="list-style-type: none">1. Describe data science.2. Describe simple ways of analysing data.3. Analyse a small dataset to identify patterns.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Data Security

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide an introduction to the use of personal data and data security, the risks associated with storing and sharing personal data, and to provide experience of basic data protection.</p> <p>The unit provides a broad overview of what personal data is, how it is measured, where it is held, and how it is used and shared in an interconnected digital world.</p> <p>A specific aim of the unit is to raise awareness of the risks associated with storing and sharing personal data, and simple strategies to protect data.</p> <p>On completion of this unit, learners will have the basic knowledge and skills in data security, and be able to demonstrate basic practical methods of protecting personal data. Learners may progress to the Data Security unit at SCQF level 5 or similar National Units.</p> <p>This unit is a mandatory unit within the National Progression Award in Cyber Security at SCQF level 4.</p>	<ol style="list-style-type: none">1. Describe how personal data can be stored, used and shared by social media.2. Identify the risks associated with storing and sharing personal data.3. Apply basic practical methods of protecting personal data.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Emerging Digital Technologies

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to expose learners to a wide range of digital technologies and by so doing encourage learners to pursue further studies in computing science or related disciplines. This unit is suitable for all learners.</p> <p>No previous knowledge or experience of digital technologies is assumed.</p> <p>Learners will explore the milestones in the development of digital technologies, emerging digital technologies, the hardware and software that powers them and their societal impacts.</p> <p>At the completion of this unit, learners could progress to J8E2 45 Emerging Digital Technologies at SCQF level 5.</p>	<ol style="list-style-type: none">1. Demonstrate knowledge and understanding of digital technologies.2. Identify applications of emerging digital technologies.3. State the impact of emerging digital technologies on society.4. Use an emerging digital technology for any purpose.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Esports: Game Performance

Level: 4

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to the fundamentals of game performance and the part this plays in the wider esports environment. No previous knowledge of esports is required for completion of this unit. A familiarity with computer games is desirable.</p> <p>Learners will be introduced to the technical aspects of esports. They will learn about different gaming platforms and their associated setups. They will also become familiar with gaming terminology. Learners will explore gameplay tactics and participate in a team-based esports game.</p> <p>On completion of this unit, learners will understand the types of hardware and software used within esports, the tactics used in esports games, gain experience of setting up an esports title for competitive gameplay and participate in an esports game.</p> <p>Learners may wish to progress to Esports: Game Performance at SCQF level 5.</p>	<ol style="list-style-type: none">1. Describe hardware and software used within esports.2. Describe tactics for different esports' game genres.3. Demonstrate performance in an esports team.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Computing Foundations

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide learners with a broad overview of fundamental computing concepts. It is designed to give learners a summary of key areas rather than an in-depth understanding of each one. The unit focuses on essential knowledge and understanding required as a foundation for further study. It is assumed that learners are familiar with digital technology prior to commencing this unit. No previous experience of computing science is assumed.</p> <p>Learners will develop their knowledge and understanding of computer architecture, logical operators, data storage, software, networking, data science, and emerging technologies including artificial intelligence.</p> <p>This unit is intended for all learners as no previous knowledge or experience is required. It is particularly relevant to learners with a vocational interest in computing and information technology (IT).</p> <p>On completion of this unit, learners will have the knowledge and skills required to progress onto more focused study and specialisation in areas of interest, such as part of the National Progression Award in Computing Technologies.</p> <p>Learners may wish to progress to J8DW 46 Computing Foundations at SCQF level 6.</p>	<ol style="list-style-type: none">1. Describe the principles of computer hardware and systems.2. Interpret computer programs.3. Demonstrate knowledge and understanding of computer networks.4. Describe the significance of data in today's society.5. Describe emerging digital technologies in society.

Evidence:		
Knowledge: Yes	Product: No	Performance: No

Unit title: Computing Project

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to apply learners' existing knowledge and skills in a practical context and develop the range of skills required to be an effective member of a team.</p> <p>The unit is suitable for learners with 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 skills in planning, collaboration, communication, and team working.</p> <p>Learners are required to produce a solution to a given project brief. The project brief will require learners to solve a routine 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.</p> <p>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.</p> <p>Learners may wish to progress to J8DY 46 Computing: Project at SCQF level 6.</p>	<ol style="list-style-type: none">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. Describe their contribution to the project.

Evidence:

Knowledge: No

Product: Yes

Performance: Yes

Unit title: Artificial Intelligence

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to introduce learners to Artificial Intelligence (AI). This unit focuses on the history, current applications, ethics, risks and opportunities posed by AI technology. This unit is designed for individuals with a general interest in AI. It is suitable for all learners.</p> <p>The unit introduces learners to the history of AI, how it is used in contemporary settings and the opportunities and risks posed by the technology. Learners will explore the relationship between AI, data science and machine learning. They will also cover categories of AI and the training paradigms used. Practical skills are also developed in training and testing simple models.</p> <p>On completion of this unit, learners will understand the core principles of Artificial Intelligence covering the history, current applications, opportunities and risks posed by the technology.</p> <p>Learners could progress to J8E0 46 Artificial Intelligence at SCQF level 6.</p>	<ol style="list-style-type: none">1. Describe the historical development of Artificial Intelligence.2. Describe current applications of Artificial Intelligence.3. Describe ethical issues relating to the use of Artificial Intelligence, and the risks and opportunities posed by the technology.4. Train and test an AI model.

Evidence:

Knowledge: Yes

Product: Yes

Performance: No

Unit title: Computer Games: Development

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to allow learners to gain knowledge and acquire routine skills in developing a computer game using a game development tool or coding. It is an introductory unit suitable for all learners. No prior knowledge or experience is required. This is a non-specialist unit, intended for a wide range of learners who may continue into further study of computer games or pursue a career in the computer games industry. The unit covers the following knowledge and skills:</p> <ul style="list-style-type: none">• Constructing a working computer game• Importing the media assets• Following a design to create a working game• Evaluating and testing the completed game <p>On completion of this unit, learners will be able to implement the design for a working computer game and evaluate the effectiveness of the final solution produced.</p> <p>On completion of this unit, learners may wish to deepen their knowledge of computer games development by completing HX9X 46 Computer Games: Development or progress onto the NC Computer Games Development.</p>	<ol style="list-style-type: none">1. Create a working computer game.2. Test the computer game.3. Evaluate a computer game.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Computer Hardware and Systems

Level: 5

Credit value: 1

Purpose	Outcomes
<p>This unit is designed for learners who have an interest in developing the skills required to upgrade an existing computer system. The unit will introduce learners to the main hardware and software components of a computer system. Learners will install a variety of hardware components, and software packages onto a computer system. This will help develop an understanding of operating systems, upgrades and the appropriate use of application and utility software. Learners will become aware of, and use, the necessary safety procedures when installing and upgrading computer hardware.</p>	<ol style="list-style-type: none">1. Identify the components and functional elements of a computer system.2. Use appropriate procedures for working safely on a computer system.3. Upgrade an existing computer system.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Computer Network Fundamentals

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to the basic theoretical characteristics and practical elements that comprise small computer networks, as well as associated security considerations, for example in a home network or small office scenario.</p> <p>This is a non-specialist introductory unit intended for learners with an interest in computer networking. This unit is mandatory within the National Progression Award in Computer Networks at SCQF level 5. However, it may be delivered on a stand-alone basis.</p> <p>Learners will cover the fundamental concepts of computer networking, the types of devices that are part of a network, and how to install, configure and troubleshoot a small network.</p> <p>Learners will also learn about the maintenance and security aspects associated with small networks. On completion of this unit, learners may progress to specific networking and / or other computing and IT related units at SCQF level 6 and 7.</p>	<ol style="list-style-type: none">1. Describe the concepts of computer networks.2. Identify the components of computer networks.3. Build a small computer network from a given brief.4. Maintain the small computer network.

Evidence:

Knowledge: Yes

Product: Yes

Performance: No

Unit title: Computer Programming

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide programming skills and knowledge of the principles of computer programming.</p> <p>This is a non-specialist unit, suitable for a wide range of learners. It is designed for learners who require an introduction to coding for vocational purposes, and for learners who wish to appreciate programming for academic or personal reasons. It is particularly suitable for learners with an interest in STEM. No previous programming experience is required.</p> <p>Learners will gain a range of practical skills and acquire relevant underpinning knowledge. They will learn how to write code in a contemporary high-level language and appreciate programming concepts and techniques, and develop their computational thinking skills.</p> <p>On completion of this unit, learners will know how to write programs to solve real-world problems.</p> <p>Learners will be able to apply programming concepts by implementing them in a programming environment. Learners may progress to HY2C 46 Computer Programming at SCQF level 6.</p>	<ol style="list-style-type: none">1. Write algorithms to solve routine problems.2. Explain programming concepts.3. Write a computer program.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Data Science

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to data science in today's world. The unit focuses on the tools and techniques involved in data science, the main methods of data analysis, and provides an opportunity for learners to apply this knowledge in a practical context. No previous knowledge or experience of data science is required. However, computational and numerical competency is presumed.</p> <p>This is a non-specialist unit, suitable for all learners, particularly those who require data skills prior to commencing university or employment. The unit covers a variety of topics relating to data science including: the reasons for the emergence of data science as a distinct discipline, the uses and misuses of data and data science, the data science life cycle and common methods of data analysis. Learners will also gain practical skills in using software to identify patterns and trends in data.</p> <p>At the completion of this unit, learners will appreciate the basic principles of data science and be able to apply this knowledge to solve routine problems using data analysis software. Learners may wish to undertake this unit alongside J2HN 45 Data Citizenship at SCQF level 5 or progress to more advanced units in this field such as J2G2 46 Data Science at SCQF level 6, which explores data science in the context of larger datasets. Learners may focus on particular aspects of data science by undertaking specialist units alongside this unit, such as J2G6 45 Machine Learning at SCQF level 5 or J2G8 45 Data Science: Statistics at SCQF level 5.</p>	<ol style="list-style-type: none">1. Describe the tools and techniques of data science.2. Describe methods of routine data analysis.3. Analyse a dataset to identify patterns and trends.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Data Security

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this Unit is to introduce concepts around personal and corporate data security, including aspects of legal and ethical obligations. Learners will discuss examples of real-life data security breaches, and examine the reputational and financial damage caused by poor data security practice.</p> <p>A specific aim of this unit is to place data security within the context of the real world. This includes the legal and ethical considerations, and the practical methods to protect personal and corporate data.</p> <p>On completion of this unit, learners will be able to use their knowledge to discuss data security breaches and provide remedial solutions, within the context of legal and ethical obligations. Learners may progress to the Data Security unit at SCQF level 6 or similar National Units.</p> <p>This unit is a mandatory unit within the National Progression Award in Cyber Security at SCQF level 5.</p>	<ol style="list-style-type: none">1. Describe the legal and ethical obligations around storing and sharing personal and business data.2. Explain the causes and effects of data security breaches.3. Protect data against security breaches.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Emerging Digital Technologies

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to expose learners to a wide range of digital technologies and by so doing encourage learners to pursue further studies in computing science or related disciplines. This unit is suitable for all learners.</p> <p>No previous knowledge or experience of digital technologies is assumed, however, completion of J8E2 44 Emerging Digital Technologies at SCQF level 4 is beneficial.</p> <p>Learners will explore the milestones in the development of digital technologies, emerging digital technologies, the hardware and software that powers them and their societal impacts. Learners will also demonstrate an understanding of the terminology associated with emerging digital technologies.</p> <p>At the completion of this unit, learners could progress to J8E2 46 Emerging Digital Technologies at SCQF level 6.</p>	<ol style="list-style-type: none">1. Describe digital technologies and their historical development.2. Describe applications of emerging digital technologies.3. Describe the impact of emerging digital technologies on society.4. Use emerging digital technologies for an educational or vocational purpose.

Evidence:

Knowledge: Yes

Product: No

Performance: Yes

Unit title: Esports: Game Performance

Level: 5

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to introduce learners to the fundamentals of game performance and the part this plays in the wider esports environment. Previous experience of Personal Computer (PC) gaming is desirable but not essential.</p> <p>Learners will be introduced to the technical aspects of esports. They will learn about different PC gaming platforms and their associated configurations. They will also become familiar with gaming terminology. Learners will select an esports game and look at gameplay styles by investigating current teams and players. Learners will perform in their selected game and analyse their gameplay.</p> <p>On completion of this unit, learners will have a firm understanding of PC configuration for esports gaming, the strategic aspect of teamplay in esports, gain experience in setting-up an esports title for competitive play and participate in an esports team game.</p> <p>Learners may wish to progress to Esports: Game Performance at SCQF level 6.</p>	<ol style="list-style-type: none">1. Describe the technical aspects of PC configuration for esports gaming.2. Describe the gameplay tactics used in esports.3. Analyse performance in an esports team.

Evidence:

Knowledge: Yes

Product: No

Performance: Yes

Unit title: Computing Foundation

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to provide learners with a broad overview of fundamental computing concepts. It is designed to give learners a summary of the key areas rather than an in-depth understanding of each one. The unit focuses on essential knowledge and understanding required as a foundation for further study.</p> <p>Learners should be familiar with computing technology before undertaking this unit, which could be evidenced by possession of an appropriate National Qualification at SCQF level 5. Alternatively, learners may have completed J8DW 45 Computing Foundations at SCQF level 5.</p> <p>Learners will develop their knowledge and understanding of computer architecture, logical operators, data storage, software, networking, data science, and emerging technologies including artificial intelligence.</p> <p>On completion of this unit, learners will have the knowledge and skills required to progress onto more focused study and specialisation in areas of interest to them or progress to qualifications at SCQF level 7.</p>	<ol style="list-style-type: none">1. Demonstrate knowledge and understanding of computer hardware and systems.2. Interpret computer programs.3. Demonstrate knowledge and understanding of computer networks.4. Explain the significance of data in today's society.5. Explain the role of emerging technologies in society.

Evidence:		
Knowledge: Yes	Product: No	Performance: No

Unit title: Computing Project

Level: 6

Credit value: 1

Purpose	Outcomes
<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Learners may wish to progress to qualifications at SCQF level 7.</p>	<ol style="list-style-type: none">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.

Evidence:

Knowledge: No

Product: Yes

Performance: Yes

Unit title: Artificial Intelligence

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to develop learners' knowledge and experience of Artificial Intelligence (AI). The unit is appropriate for a wide range of learners, particularly those with an interest in STEM.</p> <p>During the unit, learners will: understand the history of AI, explore current and emerging applications of AI, appreciate the relationship between AI and Machine Learning and different types of ML, consider the ethical issues, and discuss the risks and opportunities posed by AI. Learners will also gain practical skills in training data models using Machine Learning.</p> <p>On completion of this unit, learners will have gained confidence in their use of AI. They will understand the key principles of Artificial Intelligence, the reasons behind the growth of AI, current and emerging applications, ethical issues (including risks and opportunities) while also building the skills to evaluate and select models.</p> <p>Learners may progress to other units at this level, or further develop their knowledge and skills in this area by undertaking more advanced qualifications at SCQF level 7.</p>	<ol style="list-style-type: none">1. Explain the development of Artificial Intelligence and reasons for its growth.2. Explain current and emerging applications of Artificial Intelligence.3. Explain ethical issues relating to the use of Artificial Intelligence, and the risks and opportunities posed by the technology.4. Train, test and compare models.

Evidence:

Knowledge: Yes

Product: Yes

Performance: No

Unit title: Computer Games Development

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to allow learners to gain complex knowledge and acquire skills in developing a computer game using coding. It is an introductory unit suitable for all learners. No prior knowledge or experience is required.</p> <p>This is a non-specialist unit, intended for a wide range of learners who may continue into further study of computer games or pursue a career in the computer games industry.</p> <p>The unit covers the following knowledge and skills:</p> <ul style="list-style-type: none">• Constructing a working computer game using a computer programming language• Importing the media assets• Following a design to create a working game• Evaluating and testing the completed game <p>On completion of this unit, learners will be able to implement the design for a working computer game and evaluate the effectiveness of the final solution produced.</p> <p>On completion of this unit, learners may wish to deepen their knowledge of computer games development by progressing onto the NC in Computer Games Development.</p>	<ol style="list-style-type: none">1. Create a working computer game.2. Test the computer game.3. Evaluate a computer game.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Computer Hardware and Systems

Level: 6

Credit value: 1

Purpose	Outcomes
<p>This unit is suitable for learners with practical skills and / or knowledge of computer hardware and systems and who wish to enhance their knowledge. The unit is also suitable for learners who want an introduction to computer networks. This unit will extend the learner's knowledge of the main functional elements and structure in a computer system. The learner will develop skills relating to installing and configuring operating systems for use on a network, and acquire the skills of installing and configuring components and software required by a networked computer system. The learner will be aware of, and use the necessary safety procedures when installing and upgrading computer hardware on an organisational network. The learner will develop an understanding of the importance of testing and resolving problems. Learners will evaluate identified issues and problems and identify techniques to help resolve these more efficiently in the future.</p>	<ol style="list-style-type: none">1. Identify computer hardware components and operating system functional elements.2. Install and configure an operating system to a specific brief.3. Install and test additional computer system components with due regard to Health and Safety regulations to a specified brief.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Purpose	Outcomes
<p>This purpose of this unit is to develop learners' knowledge of computer networks.</p> <p>This is a non-specialist unit, intended for learners with an interest in computer networking. Learners should possess previous knowledge and skills of networking, This is an optional unit within the National Progression Award in Computing Technologies at SCQF level 6. However, it may also be delivered on a stand-alone basis.</p> <p>Learners will cover more challenging concepts of computer networking, the types of devices that are part of a network, IP addressing, subnetting and classes. Learners will also become familiar with the OSI model along with common network protocols and services. This will provide the learners a platform to undertake and become proficient at troubleshooting a network.</p> <p>Upon completion of this unit, learners can progress to more advanced networking qualifications such as HR87 47 Computer Network Fundamentals at SCQF level 7 or explore related topics such as cyber security or computer science.</p>	<ol style="list-style-type: none"> 1. Describe network services. 2. Explain the function of network components. 3. Establish a network addressing schema. 4. Build a network to a given specification. 5. Perform network troubleshooting.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Computer Programming

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to develop learners' programming skills, and deepen their knowledge of programming concepts and techniques. Previous programming experience is desirable, but is not essential. However, it would be beneficial for learners to have achieved HY2C 45 Computer Programming at SCQF level 5.</p> <p>This is a non-specialist unit, suitable for a wide range of learners. It is designed for learners who want to gain intermediate programming skills for vocational purposes, and for learners who wish to appreciate programming for academic or personal reasons. It is particularly suitable for learners with an interest in STEM and computer science.</p> <p>Learners will gain a range of practical skills and acquire relevant underpinning knowledge. They will learn how to write code in a high-level language and appreciate programming concepts and techniques, and develop their computational thinking skills. Learners will gain knowledge of programming concepts and programming techniques, and skills in computer programming in a contemporary high-level language.</p> <p>On completion of this unit, learners will know how to write significant programs to solve real-world problems. Learners will be able to apply programming concepts by implementing them in a programming environment.</p> <p>Learners may progress to a wide range of software development or programming qualifications at SCQF level 7, such as GF3E 15 HNC Computing or GM09 15 HNC Computer Games Development.</p>	<ol style="list-style-type: none">1. Write algorithms to solve complex problems.2. Explain programming concepts.3. Write a complex computer program.

Evidence:

Knowledge: Yes

Product: Yes

Performance: No

Unit title: Data Science

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to develop learners' knowledge and skills in data analysis. The unit focuses on the key concepts involved in data science and the main methods of data analysis, and provides an opportunity for learners to apply this knowledge in a practical context using large datasets. It is desirable, but not required, that learners possess previous knowledge and experience of data science. Computational and numerical competency is essential.</p> <p>This is a non-specialist unit intended for all learners. It is particularly relevant to learners with a vocational interest in STEM or those who intend to progress to higher level learning (in any subject). The unit covers a variety of topics relating to data science including: the applications of data science, data ethics, methods of data analysis, and how to present data using dashboards and visualisations. Learners will gain practical skills in the analysis of large datasets using contemporary software.</p> <p>At the completion of this unit, learners will appreciate the principles of data science, understand the various stages in data analysis, and be able to apply this knowledge to real-world problems using software to identify trends in data and make predictions about the future.</p> <p>Learners may wish to undertake this unit alongside J2HN 46 Data Citizenship at SCQF level 6, which explores the less technical, societal aspects of data science. Learners may focus on specific aspects of data science by undertaking specialist units alongside this unit such as J2G6 46 Machine Learning at SCQF level 6 or J2G8 46 Data Science: Statistics at SCQF level 6.</p>	<ol style="list-style-type: none">1. Explain the principles of data science.2. Explain data science techniques.3. Analyse a dataset to make predictions.

Evidence:		
Knowledge: Yes	Product: Yes	Performance: No

Unit title: Data Security

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this Unit is to explore current practice in corporate data security, and learn techniques for the development of a business security strategy.</p> <p>A specific aim of this Unit is to equip learners with knowledge and skills to create a data security policy for a professional organisation, and justify policy decisions based on best practice. Learners will be able to discuss the ethical, legal and professional aspects of the policy.</p> <p>On completion of this Unit, learners will have practical experience of the risks associated with data security, and the knowledge and skills to develop a security strategy.</p> <p>Learners may progress to National Certificates or Higher National Certificates in Computing or related qualifications. This Unit is a mandatory Unit within the National Progression Award in Cyber Security at SCQF level 6.</p>	<ol style="list-style-type: none">1. Analyse the approach to data security made by organisations.2. Investigate technologies and strategies used by businesses to protect customer data.3. Create a security strategy for a small business.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Emerging Digital Technologies

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this non-specialist unit is to expose learners to a wide range of digital technologies and by so doing encourage learners to pursue further studies in computing science or related disciplines. This unit is suitable for all learners.</p> <p>Learners should have prior knowledge and experience of digital technologies before undertaking this unit. This could be evidenced by completion of J8E2 45 Emerging Digital Technologies at SCQF level 5 or possession of appropriate National Qualifications.</p> <p>Learners will explore the historical development of digital technologies, emerging digital technologies, the hardware and software that powers them, and their societal impact.</p> <p>Learners will have the opportunity to experience a variety of emerging digital technologies while also exploring the correct terminology to support their analysis and evaluations.</p> <p>At the completion of this unit, learners could progress to more specialised units at SCQF level 6 such as J8E0 46 Artificial Intelligence.</p>	<ol style="list-style-type: none">1. Explain the historical development of digital technologies.2. Explain applications of emerging digital technologies.3. Explain the impact of emerging digital technologies on society.4. Use emerging digital technologies for vocational purposes

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

Unit title: Esports: Game Performance

Level: 6

Credit value: 1

Purpose	Outcomes
<p>The purpose of this unit is to develop learners' knowledge of PC gaming hardware and software and improve their game performance. Previous experience of Personal Computer (PC) gaming is desirable but not essential.</p> <p>This unit explores the technical aspects of PC gaming and develops learners' gaming skills. The technical aspects of the unit examine the impact of hardware components on gameplay (such as framerates and latency).</p> <p>Learners will participate in competitive computer games and evaluate their performance. Transferable skills will be developed in the unit, such as numeracy, problem solving and digital skills. On completion of this unit, learners could progress to further study within computer games design and development.</p>	<ol style="list-style-type: none">1. Explain the technical aspects of PC configuration for esports gaming.2. Explain the performance strategies used in esports.3. Evaluate performance in an esports team.

Evidence:		
Knowledge: Yes	Product: No	Performance: Yes

3 Aims of the qualification

The over-arching aim of the qualification is to provide a broad-based, flexible qualification in Computing that provides an alternative path to that provided by National Qualifications in this area.

3.1 General aims of the qualification

1. Provide an alternative programme of study to National Qualifications.
2. Stimulate interest in computing, and related disciplines, and increase the number of learners undertaking computing qualifications in Scottish schools and colleges.
3. Improve the digital skills of learners in Scottish schools and colleges.
4. Develop Core Skills and meta-skills.
5. Provide progression through the Scottish Credit and Qualification Framework.

3.2 Specific aims of the qualification

1. Provide an alternative, broad-based curriculum to National Qualifications in Computing Science with less emphasis on programming.
2. Provide a wide choice of options to reflect learners' academic and vocational interests.
3. Provide a modern and engaging curriculum, which includes emerging technologies such as artificial intelligence.
4. Develop a range of key competencies relating to computing and digital technology.
5. Develop communication, numeracy, and problem solving skills.
6. Develop computational thinking skills.
7. Develop team working and collaboration skills.
8. Provide progression paths to specialist National Progression Awards and Higher National Qualifications.

4 Recommended entry to the qualification

Entry to this qualification is at the discretion of the centre. The following information on prior knowledge, skills, experience or qualifications that provide suitable preparation for this qualification has been provided by the Qualification Design Team (QDT) as guidance only.

Learners would benefit from having attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and / or experience:

Level	Illustrative entry qualifications
4	Core Skills in Information and Communication Technology (ICT) at SCQF level 3
5	National Qualifications at SCQF level 4
6	National Qualifications at SCQF level 5

Table 7

The level 4 qualification is designed for learners with little or no knowledge of computing beyond that gained through everyday life.

Entry to level 5 is suitable for learners with any mix of National Qualifications at SCQF level 4. Learners should possess numeracy and communication skills.

Learners are most likely to benefit from undertaking the level 6 qualification after the level 5 qualification. However, direct entry is permissible for learners with an appropriate mix of National Qualifications such as National 5 Computing Science and National 5 English. Prior knowledge and experience of Computing is required for this level.

4.1 Core Skills entry profile

The Core Skill entry profile provides a summary of the associated assessment activities that exemplify why a particular level has been recommended for this qualification. The information would be used to identify if additional learning support needs to be put in place for learners whose Core Skills profile is below the recommended entry level or whether learners should be encouraged to do an alternative level or learning programme.

Core Skill	Entry to SCQF level 4	Entry to SCQF level 5	Entry to SCQF level 6
Communication	3	4	5
Numeracy	3	4	5
Information and Communication Technology (ICT)	4	5	6
Problem Solving	3	4	5
Working with Others	3	4	5

Table 8: Core Skill entry profile

5 Additional benefits of the qualification in meeting employer needs

This qualification was designed to meet a specific purpose and what follows are details on how that purpose has been met through mapping of the units to the aims of the qualification. Through meeting the aims, additional value has been achieved by linking the unit standards with those defined in national occupational standards and / or trade / professional body requirements. In addition, significant opportunities exist for learners to develop the more generic skill, known as Core Skills through doing this qualification.

5.1 Mapping of qualification aims to units

The specific aims of the qualification are:

1. Provide an alternative, broad-based curriculum to National Qualifications with less emphasis on programming.
2. Provide a wide choice of options to reflect learners' academic and vocational interests.
3. Provide a modern and engaging curriculum, which includes emerging technologies such as artificial intelligence.
4. Develop a range of key competencies relating to computing and digital technology.
5. Develop communication, numeracy, and problem solving skills.
6. Develop computational thinking skills.
7. Develop team working and collaboration skills.
8. Provide progression paths to specialist National Progression Awards and Higher National Qualifications.

The following table illustrates the contribution of each unit to these aims.

Unit title	Specific aims
Computing Foundations	1, 3, 4, 8
Computing Project	1, 5, 6, 7, 8
Artificial Intelligence	1, 2, 3
Computer Games: Development	1, 2, 3, 5, 6, 8
Computer Hardware and Systems	1, 2
Computer Network Fundamentals	1, 2
Computer Programming	1, 2, 5, 6, 8
Data Science	1, 2, 3, 8
Data Security	1, 2, 3, 8
Emerging Digital Technologies	1, 2, 3
Esports: Game Performance	1, 2, 3, 7, 8

Table 9

The mandatory units (Computing Foundations and Computing Project) deliver all the aims of the award, apart from the aim relating to optionality (aim 2). Optional units further deliver some of the aims of the award.

Computing Foundations provides an alternative broad-based curriculum to NQ Computing Science (aim 1) by covering a wide range of topics including computer hardware, operating systems, computer programming, computer networks, data science and emerging technologies (including AI). The contents are up-to-date (aim 3) and ensure that all learners know the basic concepts involved in computing (aim 4). Learners are able to progress to the next unit in the series or progress to alternative qualifications (aim 8).

Computing Project provides an opportunity for learners to apply the knowledge and skills learned in the other units in the award. This series of units is significantly different from National Qualifications (aim 1) since it involves learners in participating in a team project, which will provide them with an opportunity to develop a wide range of transferable skills (aims 5, 6 and 7). Learners can progress to the next unit in the series or progress to alternative qualifications (aim 8).

The optional units satisfy a number of aims, depending on the specific units chosen. For example, choose Emerging Digital Technologies will develop knowledge and skills in contemporary digital technologies such as AI and VR (aims 1, 2 and 3).

5.2 Mapping of National Occupational Standards (NOS) and / or trade body standards

Unit title	National Occupational Standards (NOS)
Computing Foundations	IT (Architecture, Analysis and Design)
Computing Project	IT (Solution Development, Implementation and Testing) IT (Service Management and Delivery) IT (Project Management)
Computer Games: Development	IT (Solution Development, Implementation and Testing)
Computer Hardware and Systems	IT (Architecture, Analysis and Design)
Computer Network Fundamentals	IT (Networking)
Computer Programming	IT (Solution Development, Implementation and Testing)
Data Science	IT (Data Science)
Data Security	IT (Cyber Security)

Table 10

5.3 Mapping of Core Skills development opportunities across the qualifications

Communication

Unit title	Written (Reading)	Written (Writing)	Oral
Computing Project	Not applicable	Signposted	Not applicable
Artificial Intelligence	Signposted	Not applicable	Not applicable
Emerging Digital Technologies	Signposted	Not applicable	Not applicable

Table 11

Numeracy

Unit title	Using Number	Using Graphical Information
Computing Foundations	Signposted	Signposted
Data Science	Signposted	Signposted

Table 12

Information and Communication Technology (ICT)

Unit title	Accessing Information	Providing / Creating Information
Computing Foundations	Signposted	Signposted
Computing Project	Signposted	Signposted
Artificial Intelligence	Signposted	Signposted
Computer Games: Development	Not applicable	Signposted
Computer Hardware and Systems	Signposted	Not applicable
Computer Network Fundamentals	Signposted	Not applicable
Computer Programming	Signposted	Signposted
Data Science	Not applicable	Signposted
Data Security	Signposted	Not applicable
Emerging Digital Technologies	Signposted	Signposted
Esports: Game Performance	Signposted	Not applicable

Table 13

Problem Solving

Unit title	Critical Thinking	Planning and Organising	Reviewing and Evaluating
Computing Project	Signposted	Signposted	Signposted
Computer Network Fundamentals	Signposted	Signposted	Not applicable
Computer Programming	Signposted	Signposted	Not applicable
Data Science	Not applicable	Signposted	Signposted
Data Security	Signposted	Signposted	Signposted
Emerging Digital Technologies	Not applicable	Signposted	Signposted

Table 14

Working with Others

Unit title	Working Co-operatively with Others	Reviewing Co-operative Contribution
Computing Project	Signposted	Signposted

Table 15

Unit specifications will be checked for Core Skills. When units are found to carry one or more Core Skills, the above tables will be updated to identify embedding.

Mapping of Meta Skills development opportunities across the qualifications

Meta-skills are transferable behaviours and abilities that help learners adapt and succeed in life, study and work.

There are three broad categories of meta-skills:

- **Self-management:** focusing, integrity, adapting, initiative.
- **Social intelligence:** communicating, feeling, collaborating, leading.
- **Innovation:** curiosity, creativity, sense-making, critical thinking.

The following table illustrates how each unit may contribute to learners' meta-skills development.

Unit title	Meta-skill: Self-management	Meta-skill: Social intelligence	Meta-skill: Innovation
Computing Foundations	Focusing Integrity Adapting	Communication	Curiosity Creativity Sense-making Critical
Computing Project	Focusing Integrity Adapting Initiative	Communication Feeling Collaborating Leading	Curiosity Creativity
Artificial Intelligence	Focusing Integrity Adapting	Communication	Curiosity Creativity Sense-making Critical
Computer Games: Development	Focusing Adapting	Communication Collaborating	Curiosity Creativity Sense-making Critical

Unit title	Meta-skill: Self-management	Meta-skill: Social intelligence	Meta-skill: Innovation
Computer Hardware and Systems	Focusing Adapting Initiative	Communication	Curiosity Sense-making Critical
Computer Network Fundamentals	Focusing Integrity Initiative	Communication	Curiosity Sense-making Critical
Computer Programming	Focusing Adapting Initiative	Communication Feeling Collaborating Leading	Curiosity Creativity Sense-making Critical
Data Science	Focusing Adapting Initiative	Communication	Curiosity Sense-making Critical
Data Security	Focusing Adapting Initiative	Communication	Curiosity Sense-making Critical
Emerging Digital Technologies	Focusing	Communication	Curiosity Creativity Sense-making Critical
Esports: Game Performance	Focusing Integrity Adapting	Communication Feeling Collaborating Leading	Curiosity Sense-making

Table 16

Examples of rationale for mapping of meta-skills

Unit: Computing Foundations

Meta-skill: Self-management	Meta-skill characteristics	Rationale
Focusing — The ability to manage cognitive load by filtering and sorting information in order to maintain a sense of focus in an age of information overload and constant change.	<ul style="list-style-type: none">• Sorting• Attention• Filtering	This mandatory unit requires learners to filter and sort information and to focus on its relative importance.

Unit: Computing Project

Meta-skill: Social intelligence	Meta-skill characteristics	Rationale
Communicating — The ability to openly and honestly share information in a way that creates mutual understanding about others' thoughts, intentions and ideas.	<ul style="list-style-type: none">• Receiving information• Listening• Giving information• Storytelling	This mandatory unit will involve learners receiving information. Participative learning will encourage interaction, sharing of ideas and foster mutual respect for others' views and values.

5.4 Assessment strategy for the qualifications

The unit specifications define the type of evidence required for each unit. This will be one, or more, of the following.

1. Knowledge evidence.
2. Product evidence.
3. Performance evidence.

The following table summarises the evidence requirements for each unit.

Unit title	Evidence requirements
Computing Foundations (SCQF level 4)	Knowledge
Computing Foundations (SCQF level 5)	Knowledge
Computing Foundations (SCQF level 6)	Knowledge
Computing Project (SCQF level 4)	Product, Performance
Computing Project (SCQF level 5)	Product, Performance
Computing Project (SCQF level 6)	Product, Performance
Artificial Intelligence (SCQF level 4)	Knowledge, Product
Artificial Intelligence (SCQF level 5)	Knowledge, Product
Artificial Intelligence (SCQF level 6)	Knowledge, Product
Computer Games: Development (SCQF level 4)	Knowledge, Product
Computer Games: Development (SCQF level 5)	Knowledge, Product
Computer Games: Development (SCQF level 6)	Knowledge, Product
Computer Hardware and Systems (SCQF level 4)	Knowledge, Performance
Computer Hardware and Systems (SCQF level 5)	Knowledge, Performance
Computer Hardware and Systems (SCQF level 6)	Knowledge, Performance
Computer Network Fundamentals (SCQF level 4)	Knowledge, Performance

Unit title	Evidence requirements
Computer Network Fundamentals (SCQF level 5)	Knowledge, Product
Computer Network Fundamentals (SCQF level 6)	Knowledge, Performance
Computer Programming (SCQF level 4)	Product
Computer Programming (SCQF level 5)	Knowledge, Product
Computer Programming (SCQF level 6)	Knowledge, Product
Data Science (SCQF level 4)	Knowledge, Product
Data Science (SCQF level 5)	Knowledge, Product
Data Science (SCQF level 6)	Knowledge, Performance
Data Security (SCQF level 4)	Knowledge, Performance
Data Security (SCQF level 5)	Knowledge, Performance
Data Security (SCQF level 6)	Knowledge, Performance
Emerging Digital Technologies (SCQF level 4)	Knowledge, Performance
Emerging Digital Technologies (SCQF level 5)	Knowledge, Performance
Emerging Digital Technologies (SCQF level 6)	Knowledge, Performance
Esports: Game Performance (SCQF level 4)	Knowledge, Performance
Esports: Game Performance (SCQF level 5)	Knowledge, Performance
Esports: Game Performance (SCQF level 6)	Knowledge, Performance

Table 17

The evidence requirements in each unit specification are mandatory. Centres **must** adhere to the type of evidence specified in the Statement of Standards. The Support Notes section in each unit specification provides guidance on the instruments of assessment that could be used to generate each type of evidence. Centres are free to follow this advice or devise alternative assessments.

The qualification employs criterion referenced assessment, whereby learners must satisfy every performance criterion to achieve a pass in a unit. The exception to this is when testing is used to sample knowledge. Most units permit testing of knowledge.

The assessment strategy seeks to combine knowledge, product and performance evidence to reflect the knowledge, skills and behaviours that are important in computing. Given the dynamic nature of the subject, there is a focus on knowledge evidence, which provides a theoretical foundation that learners can use when new technologies emerge.

Centres may wish to combine assessments (within and / or across units) to reduce the number of assessments involved in the qualification and, most likely, the time spent on assessment. For example, networking is part of Computing Foundations and also an optional unit, permitting learners to assess networking competences holistically.

Learners are normally permitted one re-assessment opportunity (second assessment); an additional opportunity (third assessment) may be offered in exceptional circumstances.

Evidence may come from any source (see Recognition of Prior Learning) but where it is not produced under controlled conditions it must be authenticated. SQA's *Guide to Assessment* provides advice on methods of authentication.

6 Guidance on approaches to delivery and assessment

6.1 Sequencing / integration of units

It is recommended that the units are delivered in the following sequence: Computer Foundations, Optional units, Computer project (see Figure 1).

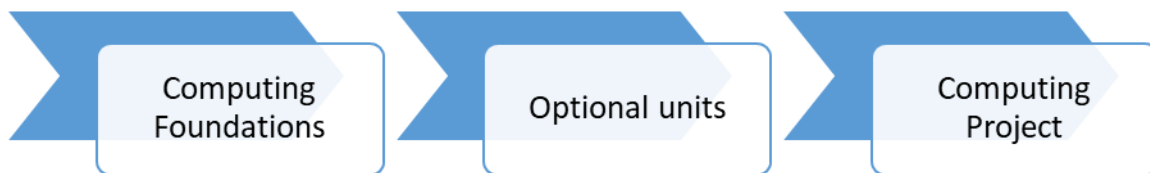


Figure 1

The Foundation series of units provide essential knowledge for learners and should, therefore, be the first taught unit. The optional units permit learners to specialise in two (or more) fields of computing such as AI and emerging technologies. The final unit (Project) builds on these general and specific competences by providing learners with an opportunity to apply their knowledge and skills in a practical context. The Foundations unit can be taught before or alongside the optional units. Where there is overlap between units, topics should only be taught once.

The Project unit is context free. The project may relate to any practical aspect of computing. Suitable projects include:

- data analysis project
- networking project
- emerging technologies project
- integrated project

An integrated project (one that involves a range of computing competences) is encouraged. For example, a project that involves the building of a gaming PC would cover a wide range of knowledge and skills, drawn from a number of component units.

A number of pathways exist within the suite of qualifications. These pathways provide a coherent and consistent curriculum for learners. Some examples follow.

General / technical pathway

This pathway is suitable for learners who want a broad-based technical education. Pathway as follows: Computing Foundations, Computer Hardware and Systems, Computer Network Fundamentals, Computing Project (see Figure 2).

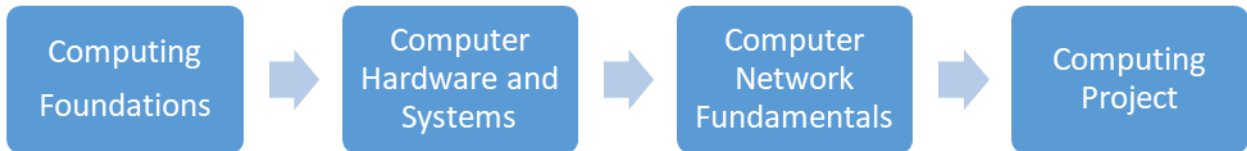


Figure 2

This pathway is suitable for progression to Higher National Qualifications such as HNC Computing. The Project unit could involve a network building activity.

Programming pathway

This pathway is suitable for learners with an interest in software development. Pathway as follows: Computing Foundations, Computer Programming, Computer Games Development, Computer Project, (see Figure 3).



Figure 3

This pathway is suitable for progression to Higher National Qualifications such as HND Software Development or HND Computer Games Development. The Project unit could involve the development of a computer game.

Data science pathway

This pathway is suitable for learners with an interest in data science. Pathway as follows: Computing Foundations, Data science, Data Security, Computing Project, (see Figure 4).



Figure 4

This pathway is suitable for progression to Higher National Qualifications such as HND Data Science. The Project unit could involve a data analysis activity.

Emerging technologies pathway

This pathway is suitable for learners with an interest in new technologies. Pathway as follows: Computing Foundations, Emerging Digital Technologies, Artificial Intelligence, Computing Project, (see Figure 5).

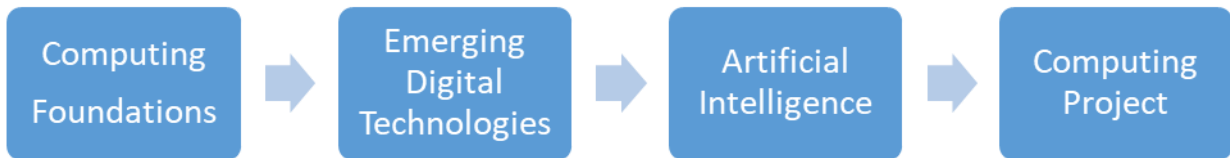


Figure 5

This pathway is suitable for learners who want a broad-based, contemporary, engaging curriculum. The Project unit could involve the creation of a chatbot.

Computer games pathway

This pathway is suitable for learners with an interest in computer games. Pathway as follows: Computing Foundations, Esports: Game Performance, Computer Games Development, Computing Project, (see Figure 6).



Figure 6

This pathway is suitable for learners who want to focus on gaming. The Project unit could involve the design of a computer game.

6.2 Approaches to assessment

6.2.1 Stand-alone, combined and integrated assessment

The evidence requirements for each unit within the suite of awards are summarised in Table 16. Centres are free to develop any form of assessment that produces the requisite evidence. The Support Notes section in each unit specification provides guidance on suitable instruments of assessment.

Assessments can be one of three forms:

1. Stand-alone assessments.
2. Combined assessments.
3. Integrated assessments.

Stand-alone assessments are instruments that seek to generate **one** type of evidence for a specific outcome in a specific unit. For example, a practical assignment could generate the product evidence required in Artificial Intelligence at SCQF level 5 for outcome 4.

Combined assessments are instruments that seek to generate evidence for multiple outcomes. For example, a multiple choice test could generate the knowledge evidence required in Artificial Intelligence at SCQF level 5 for outcomes 1, 2 and 3.

Integrated assessments are instruments that seek to generate evidence for multiple outcomes across multiple units. For example, all of the knowledge evidence required across multiple units could be combined into a single test that samples across the component units. This is particularly important where there is overlap between mandatory and optional units.

Centres are encouraged to use combined and integrated assessments to reduce the time spent on assessment. The following example is based on the qualification at SCQF level 5 involving the following units:

Stand-alone assessments are instruments that seek to generate **one** type of evidence for a specific outcome in a specific unit. For example, a practical assignment could generate the product evidence required in Artificial Intelligence at SCQF level 5 for outcome 4.

Combined assessments are instruments that seek to generate evidence for multiple outcomes. For example, a multiple choice test could generate the knowledge evidence required in Artificial Intelligence at SCQF level 5 for outcomes 1, 2 and 3.

Integrated assessments are instruments that seek to generate evidence for multiple outcomes across multiple units. For example, all of the knowledge evidence required across multiple units could be combined into a single test that samples across the component units. This is particularly important where there is overlap between mandatory and optional units.

Centres are encouraged to use combined and integrated assessments to reduce the time spent on assessment. The following example is based on the qualification at level 5 involving the following units:

1. Computing Foundations
2. Artificial Intelligence
3. Emerging Digital Technologies
4. Computing Project.

Assessment	Type	Instrument	Units / Outcomes
1	Integrated	Multiple-choice test	<ul style="list-style-type: none"> • Computing Foundations (outcomes 1–5) • Artificial Intelligence (outcomes 1–3) • Emerging Digital Technologies (outcomes 1–3)
2	Integrated	Practical assignment	<ul style="list-style-type: none"> • Artificial Intelligence (outcome 4) • Emerging Digital Technologies (outcome 4)
3	Combined	Project	<ul style="list-style-type: none"> • Computing Project (outcomes 1–4)

These three assessments would generate the evidence required for the qualification at SCQF level 5.

6.2.2 Project unit

The Project unit is a vital part of the qualification, seeking to integrate knowledge and skills through a realistic, practical, team-based activity. A wide range of potential projects can be undertaken, which will be determined by the optional units selected by learners. Some suitable projects are described below.

Optional unit 1	Optional Unit 2	Optional project
Artificial Intelligence	Emerging Digital Technologies	Creation of an intelligent chatbot.
Computer Games: Development	Esports: Game Performance	Designing a new computer game.
Computer Hardware and Systems	Computer Network Fundamentals	Building a small network.
Computer Programming	Data Science	Writing code to perform data analysis.

Note that research-based projects are **not** permissible. The project must involve the practical application of existing knowledge and skills.

Composition of teams

The evidence requirements require that project teams comprise two to four learners and must not be self-selecting. When a single learner is undertaking the qualification at a specific level, project teams could comprise learners across levels. If this is not possible (because the centre only offers one level), the teacher can play the role of a team member. Teams should be selected by teachers, and not self-selected by learners, to reflect the mix of backgrounds that are typically involved in project work in the workplace. Teams should be mixed by demographics and abilities insofar as possible, given the cohort undertaking the qualification. Learners with additional support needs may require assistance and may be teamed with a specialist teacher. However, in this circumstance, team working, communication and collaboration skills must still be developed.

Delivery and assessment of projects

Projects should be undertaken after the other units in the qualification. It may be possible to commence the project before the final optional unit is complete.

Although learners are expected to possess the requisite knowledge and skills **before** commencing the project, teachers may have to spend some time discussing project management and meta-skills. For example, learners may require time to develop their project planning skills prior to starting the project. Meta-skills may be new to learners, in which case time will be required to explain meta-skill frameworks such as Skills Development Scotland's 'Skills 4.0' framework.

Each learner must provide the following evidence.

1. Project plan
2. Design documentation
3. Test plan and test results
4. Product (solution) and product documentation
5. Personal statement.

Items 1–4 will be produced by the team; item 5 will be produced by the learner.

Every item must be complete, except item 4 (the product / solution), which may be incomplete (but not significantly so).

Each learner must make a significant contribution to each item of evidence produced by the team (items 1–4). However, individual learners may play a lead role in the production of specific items (this is encouraged).

It will be possible for individual learners to successfully complete the project when the team collectively does not. For example, an individual's contribution to the product / solution may be considered acceptable even when the overall product / solution is inadequate. Conversely, an individual learner may be unsuccessful when the team collectively has produced acceptable evidence as a result of their inadequate contribution to one or more items.

6.3 Recognition of prior learning

SQA recognises that learners gain knowledge and skills acquired through formal, non-formal and informal learning contexts.

In some instances, a full group award may be achieved through the recognition of prior learning. However, it is unlikely that a learner would have the appropriate prior learning and experience to meet all the requirements of a full group award.

The recognition of prior learning may **not** be used as a method of assessing in the following types of units and assessments:

- HN Graded Units.
- Course and / or external assessments.
- Other integrative assessment units (which may or not be graded).
- Certain types of assessment instruments where the standard may be compromised by not using the same assessment method outlined in the unit.
- Where there is an existing requirement for a licence to practice.
- Where there are specific health and safety requirements.
- Where there are regulatory, professional or other statutory requirements.
- Where otherwise specified in an assessment strategy.

More information and guidance on the *Recognition of Prior Learning* (RPL) may be found on our website www.sqa.org.uk.

The following sub-sections outline how existing SQA units may contribute to this group award. Additionally, they also outline how this group award may be recognised for professional and articulation purposes.

6.3.1 Articulation and / or progression

Achievement of this qualification at higher levels (SCQF level 5 and, particularly, SCQF level 6) would contribute to the entry requirements of some HNQs. Taken in combination with other qualifications at SCQF level 6, this qualification would provide suitable entry to HNC Computing or related subjects.

The main progression pathway is internal, from one level to the next, for example, progressing from the SCQF level 5 qualification to the SCQF level 6 qualification.

Learners may also wish to progress to more specialised National Progression Awards such as NPA Cyber Security or NPA Data Science. For example, learners who complete this award at level 5 with an vocational interest in data security could progress to NPA Cyber Security at the same level.

6.3.2 Professional recognition

There is no professional recognition of this qualification.

6.3.3 Transitional arrangements

This is a new qualification. There are no transitional arrangements.

6.3.4 Credit transfer

This qualification is new. There are no credit transfer arrangements.

6.4 Opportunities for e-assessment

This qualification is supported by SOLAR (<https://www.sqasolar.org.uk>). Digital assessments are available for all component units.

6.5 Support materials

A list of existing Assessment Support Packs (ASPs) is available to view on SQA's website.

6.6 Resource requirements

Centres will require a range of computing resources to offer this qualification. Centres that currently deliver National Qualifications in Computing Science will be suitably resourced to deliver this award (subject to option choices).

The resource requirements of the mandatory units (Computing Foundations and Computing Project) are low. Basic computing facilities are sufficient.

The resource requirements of the optional units vary depending on the options chosen. For example, Computer Programming can be delivered on any computer capable to running a programming language; conversely, Esports: Game Performance requires access to gaming PCs.

7 General information for centres

Equality and inclusion

The unit specifications making up this group award have been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners will 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.

Internal and external verification

All assessments used within these qualifications should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment* (www.sqa.org.uk/GuideToAssessment).

8 Glossary of terms

Embedded Core Skills is where the assessment evidence for the unit also includes full evidence for complete Core Skill or Core Skill components. A learner successfully completing the unit will be automatically certificated for the Core Skill. (This depends on the unit having been successfully audited and validated for Core Skills certification.)

Finish date: The end of a group award's lapsing period is known as the finish date. After the finish date, the group award will no longer be live and the following applies:

- candidates may not be entered for the group award.
- the group award will continue to exist only as an archive record on the Awards Processing System (APS).

Lapsing date: When a group award is entered into its lapsing period, the following will apply:

- the group award will be deleted from the relevant catalogue.
- the group award specification will remain until the qualification reaches its finish date at which point it will be removed from SQA's website and archived.
- no new centres may be approved to offer the group award.
- centres should only enter candidates whom they expect to complete the group award during the defined lapsing period.

SQA credit value: The credit value allocated to a unit gives an indication of the contribution the unit makes to an SQA group award. An SQA credit value of 1 given to an SQA unit represents approximately 40 hours of programmed learning, teaching and assessment.

SCQF: The Scottish Credit and Qualification Framework (SCQF) provides the national common framework for describing all relevant programmes of learning and qualifications in Scotland. SCQF terminology is used throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at [Scottish Credit and Qualifications Framework \(SCQF\) www.scqf.org.uk](http://www.scqf.org.uk).

SCQF credit points: SCQF credit points provide a means of describing and comparing the amount of learning that is required to complete a qualification at a given level of the Framework. One National Unit credit is equivalent to 6 SCQF credit points. One National Unit credit at Advanced Higher and one Higher National Unit credit (irrespective of level) is equivalent to 8 SCQF credit points.

SCQF levels: The level a qualification is assigned within the framework is an indication of how hard it is to achieve. The SCQF covers 12 levels of learning. HNCs and HNDs are available at SCQF levels 7 and 8 respectively. Higher National Units will normally be at levels 6–9 and graded units will be at level 7 and 8. National Qualification Group Awards are available at SCQF levels 2–6 and will normally be made up of National Units which are available from SCQF levels 2–7.

Subject unit: Subject units contain vocational / subject content and are designed to test a specific set of knowledge and skills.

Signposted Core Skills: Refers to opportunities to develop Core Skills arise in learning and teaching but are not automatically certificated.

History of changes

It is anticipated that changes will take place during the life of the qualification and this section will record these changes. This document is the latest version and incorporates the changes summarised below. Centres are advised to check SQA's APS Navigator to confirm they are using the up-to-date qualification structure.

NOTE: Where a unit is revised by another unit:

- ◆ No new centres may be approved to offer the unit which has been revised.
- ◆ Centres should only enter candidates for the unit which has been revised where they are expected to complete the unit before its finish date.

Version number	Description	Date

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of this qualification.

Template version: March 2024

9 General information for learners

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

This qualification will help you learn about computing technology. It is an ideal qualification if you are interested in computing or digital technology. You will learn theory and gain practical skills during the qualification. The qualification includes:

- computer systems
- emerging digital technologies such as virtual reality
- artificial intelligence
- computer programming
- computer networks
- esports

An important part of the qualification is a project, which will involve you working with other learners to carry out a computing task in a team. You will gain a range of skills during the project including team working, communication and collaboration skills.

The qualification is available at three levels: Level 4 (National 4), Level 5 (National 5) and Level 6 (Higher). You can do one of these levels, two of the levels, or all three.

You will be able to try the Level 4 and Level 5 qualifications without much knowledge of computing but for Level 6 you should already possess a suitable qualification in Computing Science or equivalent.

During the qualification you will learn about computer fundamentals (such as how computers work) and choose from a range of options such as artificial intelligence and computer programming. You will then apply your knowledge to a team project. The project might involve you (and others) building a PC or constructing a network or using AI.

The assessment might comprise a test of your knowledge and a practical exercise to assess your skills. Assessment will be straightforward and will not take a great deal of time.

When you complete one level of this qualification you could move to the next level. Alternatively, you could try a National Qualification or other, more specialised, National Progression Awards such as NPA Cyber Security. Completion of Level 6, together with other qualifications, would be good preparation for HNC Computing.