National Unit Specification

General information

Unit title: Emerging Digital Technologies (SCQF level 5)

Unit code: J8E2 45

Superclass: CB

Publication date: July 2024

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

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.

No previous knowledge or experience of digital technologies is assumed, however, completion of J8E2 44 Emerging Digital Technologies at SCQF level 4 is beneficial.

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.

At the completion of this unit, learners could progress to J8E2 46 Emerging Digital Technologies at SCQF level 6.

National Unit Specification: General information (continued)

Unit title: Emerging Digital Technologies (SCQF level 5)

Outcomes

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

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.

Credit points and level

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

Recommended entry to the unit

Entry is at the discretion of the centre. No previous knowledge of experience is required. Basic literacy and numeracy skills are assumed.

Core Skills

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

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

Context for delivery

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

The target cohort is school and college learners with an interest in computing and technology. The unit will be of interest to any learner who wishes to understand emerging digital technologies.

This unit is an optional component within the National Progression Award in Computing Technologies at SCQF level 5.

National Unit Specification: General information (continued)

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Equality and inclusion

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

Further advice can be found on our website:
SQA Assessment Arrangements (www.sqa.org.uk/assessmentarrangements).

National Unit Specification: Statement of standards

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

Outcome 1

Describe digital technologies and their historical development.

Performance criteria

(a) Define digital technologies.
(b) Describe the historical development of digital technologies.
(c) Describe examples of established digital technologies.
(d) Describe applications of established digital technologies in our day to day lives.
(e) Describe the advantages and disadvantages of digital technologies.
(f) Describe careers within the digital technology sector.

Outcome 2

Describe applications of emerging digital technologies.

Performance criteria

(a) Define emerging digital technologies.
(b) Describe examples of emerging digital technologies.
(c) Describe reasons for the development of emerging digital technologies.
(d) Describe current applications of emerging digital technologies.
(e) Describe potential applications of emerging digital technologies.

Outcome 3

Describe the impact of emerging digital technologies on society.

Performance criteria

(a) Describe the impact of emerging digital technologies on productivity.
(b) Describe the impact of emerging digital technologies on work and education.
(c) Describe the impact of emerging digital technologies on the environment and sustainability.
(d) Describe the impact of emerging digital technologies on privacy and security.

National Unit Specification: Statement of standards (continued)

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Outcome 4

Use emerging digital technologies for an educational or vocational purpose.

Performance criteria

(a) Describe the characteristics of the technologies.
(b) Use the technologies appropriately and effectively for an educational or vocational purpose.
(c) Describe the output of the technologies.
(d) Use terminology appropriately and correctly.

Evidence requirements for this unit

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

1. Knowledge evidence.
2. Performance evidence.

Knowledge evidence relates to outcomes 1, 2 and 3. All performance criteria must be evidenced. Minimal evidence, required to infer competence, is acceptable. At least one established technology (outcome 1) and at least two emerging technologies (outcome 2 and outcome 3) must be evidenced. Knowledge evidence may be produced throughout the duration of this unit in lightly controlled conditions with access to reference materials.

Knowledge evidence may be sampled when testing is used. Testing must be carried out in timed, supervised conditions **without** access to reference materials. The sampling frame must include questions from all three outcomes.

Performance evidence relates to outcome 4. Learners must be observed using at least two emerging digital technologies. The performance evidence will comprise:

1. description of the characteristics of the technologies.
2. copy of the output of the technologies.
3. confirmation that the learner's use of the technologies was appropriate and effective.
4. confirmation that the learner's use of terminology was appropriate and correct.

Performance evidence may be produced throughout the duration of this unit in lightly controlled conditions with access to reference materials.

National Unit Specification: Statement of standards (continued)

Unit title: Emerging Digital Technologies (SCQF level 5)

When evidence is produced in loosely controlled conditions it must be authenticated. The Guide To Assessment provides advice on methods of authentication.

The SCQF level of this unit (level 4) provides additional context on the nature of the required evidence and the associated standards. Appropriate level descriptors should be used when making judgements about the evidence.

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

National Unit Support Notes

Unit title: Emerging Digital Technologies (SCQF level 5)

Unit support notes are offered as guidance and are not mandatory.

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

Guidance on the content and context for this unit

The purpose of this non specialist unit is to introduce learners to emerging digital technologies and provide them with hands on experience. Previous experience with emerging digital technologies is not essential. This unit may be undertaken using a variety of technologies, both in hardware and software form.

This unit will explore the history of traditional technologies before immersing the learner within emerging digital technologies, their impacts on society and routes into careers. Learners will then participate in demonstrations of emerging digital technologies, either as a group or an individual, before writing a review of their experiences and evaluating the technology.

Guidance on approaches to delivery of this unit

The following distribution of time is suggested.

Outcome 1: 10 hours.
Outcome 2: 10 hours.
Outcome 3: 10 hours.
Outcome 4: 10 hours.

A significant part of the unit is outcome 4, where learners are able to experience emerging digital technologies first hand. Outcomes 1, 2 and 3 are designed to provide knowledge and set a foundation for this experience. As a result, the emerging digital technologies used for outcome 4 should be used as a reference throughout the unit and used as a focal point for all learning. However, other technologies that aren't being used within the unit can also be discussed and where possible demonstrated so to enhance the experience for the learners.

National Unit Support Notes (continued)

Unit title: Emerging Digital Technologies (SCQF level 5)

Emerging digital technologies is an almost endless categorisation of technology which will constantly change. As a result, there is no specification of which technologies should or shouldn't be used, and it is at the centres discretion as to which technologies they will deliver. The decided technologies however must be suitable to meet the performance criteria of outcomes 2 and 3, while also being appropriate for demonstration by the learners.

The following are examples of emerging digital technologies that could be used throughout this unit. This is not an exhaustive list. Each technology may be used in ways which differs from the example uses. The example uses should be used as a starting point only and should not limit the scope of projects. The depth of exposure for each technology should be reflective of the level the learner is working at.

Emerging Digital Technology	Example uses
Chat GPT / Copilot (AI)	Used as an educational / vocational tool to support the creation of a coding project. This could be a game, piece of software or a website. Learners could use AI as a resource by learning the skills of a prompt engineer by generating text or graphics. This could also be used in conjunction with the Artificial Intelligence unit as part of the National Progression Award in Computing Technologies.
Virtual Reality (VR)	Used as an educational resource in applications such as Mission ISS which allows the exploration of the International Space Station or Organon 3D which teaches about human anatomy. Learners could explore health and wellbeing by using training applications such as Beat Saber or Supernatural. Used for entertainment where learners can play a variety of appropriate games. Additionally, learners could develop their own Virtual Reality applications as part of the Development unit of the National Progression Award in Computer Games Development.

Emerging Digital Technology	Example uses
Augmented Reality (AR)	Learners could play games such as Pokémon Go which immerses gameplay mechanics into the real world. Learners could test out furniture and decorations within a room using apps such as IKEA and Amazon shopping. Learners could use apps such as Dulux Visualiser to paint and decorate different rooms.
Blockchain	Exploration of blockchain including cryptocurrency and NFTs. Learners could create NFT projects such as digital art galleries or digital yearbooks.
Internet of Things (IoT)	Learners could develop projects using devices such as Raspberry Pi and Micro:bits. Learners could compete annually in the PA Raspberry Pi Competition which runs annually. Similar competitions or events could also be included. These projects could also be implemented into the Computing Project unit as part of the National Progression Award in Computing Technologies.
Robotics	Lego Robotics could be used to create various projects including robots to examine an environment that is equipped with sensors or robots that aims to play games. The use of drones could be explored and their applications with other technology such as photography and videography. Learned could explore the building of programmable robots to serve a purpose.

National Unit Support Notes (continued)

Unit title: Emerging Digital Technologies (SCQF level 5)

Guidance on approaches to assessment of this unit

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

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

A traditional approach to assessment might involve the use of a test for outcomes 1, 2 and 3 and a practical assignment for outcome 4.

The test could comprise of a selected response (multiple-choice) test of learner's knowledge with an appropriate pass mark. The test would include but is not limited to questions relating to:

- Terminology
- History of technology
- Examples of emerging digital technologies
- The impact of emerging digital technologies
- Uses of emerging digital technologies
- Careers

The practical assignment could comprise of a learner, or groups of learners, demonstrating a piece of emerging digital technology. The used technology should be reflective of both the level of the unit and whether it's being demonstrated as a group or an individual. The Evidence Requirements define the standards expected from learners and teams in this scenario. An observation checklist, completed by an assessor, would be required.

A more contemporary approach to assessment might involve learners maintaining a portfolio of evidence. If this approach is adopted, every performance criterion must be evidenced.

- Use video recording to gather video evidence of the demonstration of the technologies.
- Mixed evidence of presentation of knowledge, analysis of technologies, word documents, audio and video recordings, etcetera.

National Unit Support Notes (continued)

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Opportunities for e-assessment

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

Opportunities for developing Core and other essential skills

This unit provides opportunities to develop Core Skills particularly Information and Communication Technology (ICT), Digital Learning, Innovation, Creativity, Communication and Literacy at SCQF level 5.

History of changes to unit

Version	Description of change	Date

General information for learners

Unit title: Emerging Digital Technologies (SCQF level 5)

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

This unit allows you to explore the world of digital technology with a focus on emerging technologies such as articial intelligence, virtual reality, augmented reality and cryptocurrency. The technical aspect of this unit examines the history of digital technology and its practical usage before drilling down into emerging technologies and its applications.

In outcome 1 you will learn about the history of digital technology and explore the different types of technologies that are commonplace.

In outcome 2 you will explore emerging digital technologies and their applications within the real world and their impacts and future developments.

In outcome 3 you will look at the societal impacts of emerging digital technologies, the advantages and disadvantages of using them and the career paths they offer.

Finally, in outcome 4, you will demonstrate the usage of an emerging digital technology for specific purposes and explore their technical specifications and requirements before writing a reviewing and evaluating your experience.

The unit covers the following knowledge and skills.

Knowledge	Skills
• The skills and qualities for technology related careers. • Components of digital devices. • Milestones in the development of digital technologies. • Uses of digital technologies. • Benefits of digital technologies. • Examples of emerging digital technologies. • Terminology associated with emerging digital technologies. • Applications of emerging digital technologies. • Careers in digital technology. • Impact of technologies on society. • Technical specifications of technologies.	• Basic skills in using emerging digital technologies. • Literacy skills. • Analytical skills. • Evaluative skills.

General information for learners (continued)

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Your knowledge may be assessed through a short test while your performance will be assessed by demonstrating and writing about the use of emerging digital technologies. Alternatively, in place of a test, you may be asked to maintain a portfolio as evidence of your work and the demonstration of the technologies.

Upon completion of this unit, you may wish to progress to Computing: Emerging Digital Technologies at SCQF level 6.