Qualification specification

NCFE Level 3 Certificate in the Principles of Blockchain
QN: 610/0522/8

Qualification summary

Qualification title	**NCFE Level 3 Certificate in the Principles of Blockchain**		
Ofqual qualification number (QN)	610/0522/8	**Aim reference**	61005228
Guided learning hours (GLH)	185	**Total qualification time (TQT)**	290
Minimum age	16		
UCAS	This qualification has been allocated UCAS points. Please refer to the UCAS website for further details of the points allocation and the most up-to-date information.		
Qualification purpose	This qualification is designed for learners who want to increase their knowledge and understanding of blockchain. Successful completion of the required units will allow the learner to develop in-depth knowledge and understanding of blockchain. Learners will also be introduced to programming knowledge and skills. This qualification will support progression into relevant employment and further study in blockchain.		
Grading	Achieved/not yet achieved		
Assessment method	Internally assessed and externally quality assured portfolio of evidence.		
Work/industry placement experience	Work/industry placement experience is not required.		

Contents

Summary of changes

This document summarises the changes to this qualification specification since the last version (Version 1.0 July 2022). Please check the NCFE website for the most recent version.

Version	Publication date	Summary of amendments
v1.0	July 2022	First publication
v1.1	July 2023	Information regarding UCAS added to About this qualification, Qualification Summary.

Section 1: introduction

If you are using this qualification specification for planning purposes, please make sure that you are using the most recent version.

Aims and objectives

This qualification aims to:

- focus on the study of blockchain within the digital technology sector
- offer breadth and depth of study, incorporating a key core of knowledge

The objective of this qualification is to:

- provide the learner with in-depth knowledge and understanding of blockchain

Throughout this qualification, we use the term ‘programming’ which is also known as ‘coding’.

Support handbook

This qualification specification must be used alongside the mandatory support handbook which can be found on the NCFE website. This contains additional supporting information to help with planning, delivery and assessment.

This qualification specification contains all of the qualification-specific information you will need that is not covered in the support handbook.

Guidance for entry and registration

This qualification is designed for learners who are working in, or would like to work in, a role where use of blockchain is a current or emerging requirement. It is ideal for those who want to consolidate their existing knowledge which can be used to assist in seeking employment or proceeding to further study in this area.

It may also be useful to learners studying qualifications in the following sectors/areas:

- software development
- programming
- network engineering
- network security
- cyber security
- data analytics

Registration is at the discretion of the centre, in accordance with equality legislation and should be made on the Portal.

There are no specific prior skills/knowledge a learner must have for this qualification. However, learners may find it helpful if they have already achieved a level 2 digital skills or information technology related qualification.

Centres are responsible for ensuring that all learners are capable of achieving the learning outcomes and complying with the relevant literacy, numeracy and health and safety requirements.

Learners registered on this qualification should not undertake another qualification at the same level, or with the same/a similar title, as duplication of learning may affect funding eligibility.

Achieving this qualification

To be awarded this qualification, learners are required to successfully achieve **6** mandatory units.

Please refer to the list of units in appendix A or the unit summaries in section 2 for further information.

To achieve this qualification, learners must successfully demonstrate their achievement of all learning outcomes of the units as detailed in this qualification specification. A partial certificate may be requested for learners who do not achieve their full qualification but have achieved at least one whole unit, partial certificate fees can be found in the fees and pricing document on the NCFE website.

Progression

Learners who achieve this qualification could progress to the following:

- employment:
  - business analyst
  - blockchain developer
  - junior/associate software engineer
- further education:
  - level 4 qualifications in programming
  - level 4 qualifications in network engineering
  - level 4 qualifications in cyber security

Progression to higher level studies

Level 3 qualifications can support progression to higher level study, which requires knowledge and skills different from those gained at levels 1 and 2. Level 3 qualifications enable learners to:

- apply factual, procedural and theoretical subject knowledge
- use relevant knowledge and methods to address complex, non-routine problems
- interpret and evaluate relevant information and ideas
- understand the nature of the area of study or work
- demonstrate an awareness of different perspectives and approaches
- identify, select and use appropriate cognitive and practical skills
- use appropriate research to inform actions
- review and evaluate the effectiveness of their own methods

Resource requirements

To assist in the delivery of this qualification, centres and learners should have access to the following mandatory resources to cover all the appropriate learning outcomes:

- computer laptop/desktop with internet access
- web browser software/applications
- programming software

Real work environment (RWE) requirement/recommendation

Experience in the real work environment is not required.

Work/industry placement experience

Work/industry placement experience is not required.

How the qualification is assessed

Assessment is the process of measuring a learner's skill, knowledge and understanding against the standards set in a qualification.

This qualification is internally assessed and externally quality assured.

The assessment consists of one component:

- an internally assessed portfolio of evidence which is assessed by centre staff and externally quality assured by NCFE (internal quality assurance (IQA) must still be completed by the centre as usual)

Learners must be successful in this component to gain the Level 3 Certificate in the Principles of Blockchain.

All the evidence generated by the learner will be assessed against the standards expected of a level 3 learner for each learning outcome.

Unless otherwise stated in this specification, all learners taking this qualification must be assessed in English and all assessment evidence presented for external quality assurance must be in English.

Internal assessment

Each learner must create a portfolio of evidence generated from appropriate assessment tasks, which demonstrates achievement of all the learning outcomes associated with each unit. On completion of each unit, learners must declare that the work produced is their own and the assessor must countersign this. Examples of suitable evidence for the portfolio for each unit are provided in section 2.

If a centre needs to create their own internal assessment tasks, there are 4 essential elements in the production of successful centre-based assessment tasks, these are:

- ensuring the assessment tasks are meaningful with clear, assessable outcomes
- appropriate coverage of the content, learning outcomes, or assessment criteria
- having a valid and engaging context or scenario
- including sufficient opportunities for stretch and challenge for higher attainers

Please see the guidance document for creation of internal assessment tasks on our website.

Assessment guidance is provided for each unit. Assessors can use other methods of assessment as long as they are valid and reliable and maintain the integrity of the assessment and of the standards required of this qualification.

Section 2: unit content and assessment guidance

This section provides details of the structure and content of this qualification.

The types of evidence listed are for guidance purposes only. Within learners' portfolios, other types of evidence are acceptable if all learning outcomes are covered and if the evidence generated can be internally and externally quality assured. For approval of methods of internal assessment other than portfolio building, please contact your external quality assurer.

The explanation of terms explains how the terms used in the unit content are applied to this qualification. This document can be found in section 3.

Unit 01 Introduction to blockchain (A/650/1456)

Unit summary			
In this unit learners will understand the key concepts of blockchain. They will know about the purpose of blockchain and how it works.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**25 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Know about the purpose of blockchain	1.1 Define what is meant by **blockchain**
	1.2 Identify the **origins** of blockchain
	1.3 Explain the **purpose** of blockchain
	1.4 Differentiate between **types** of blockchain
	1.5 Identify the **benefits** of blockchain for businesses and individuals
2. Understand the key concepts of blockchain	2.1 Describe why the following concepts are important to blockchain: • **decentralisation** • **privacy and security** • **transparency**
	2.2 Describe how blockchain technology achieves **immutability**
	2.3 Describe the **function and purpose** of a consensus mechanism
3. Know how blockchain works	3.1 Explain what is meant by a **transaction** in the context of blockchain
	3.2 Describe the **composition of a block**
	3.3 Explain what is meant by **validation** in the context of blockchain
	3.4 Describe how a block gets added to the blockchain
	3.5 Explain how the blockchain remains **tamper-proof**

Range
1. Know about the purpose of blockchain
1.1 Blockchain: Must be defined in the context of distributed ledger technology and cryptography. **1.2 Origins:** The learner will identify key developments in the origins of blockchain. **1.3 Purpose:** • store of value – data and/or cryptocurrencies • immutable • distributed • generates trust without the need for a trusted third party

Range
1.4 Types must include: • private • public • permissioned **1.5 Benefits:** Learners will identify how blockchain can benefit businesses and individuals by tackling some of the challenges they face. Examples could include: • cyber security • efficiency • transparency • automation • no reliance on a third party as the blockchain is distributed over all nodes
2. Understand the key concepts of blockchain
2.1 Decentralisation: • by having ownership across the network, it is secure but is trustless • trust is distributed across the network • every member of the decentralised network has an opportunity to contribute • transfer of control as control is spread over the network **2.1 Privacy and security:** • transactions are visible and traceable but not necessarily the contents/data • the use of the public/private key mechanism secures a transaction • hashed **2.1 Transparency:** • everything on the network (public/hybrid) is trustless • open source so people can build on the network • transactions are visible and traceable **2.2 Immutability** must include: • distributed/decentralised construction of the block • hashing/checksum signature • unaltered **2.3 Function and purpose** must include: • defines the method to secure the block on the chain • incentivised • fault tolerant • provides agreement across distributed systems • attack resistant (such as Sybil) by use of consensus algorithms

Range
3. Know how blockchain works

3.1 Transaction:
 	
• authentication
• nodes
• validation
• distribution
• reward
• system is updated
 	
3.2 Composition of a block:
 	
• the block header:
  ○ version
  ○ hash
  ○ Merkle tree/root
• the block body:
  ○ transactions
• the transaction:
  ○ nonce
  ○ difficulty target
  ○ state – the balance, code and storage
  ○ timestamps
 	
3.3 Validation:
 	
• verifying the transaction
• nodes in agreement (hash)
• cryptographic hash value of the previous block is inserted into the data of the next block – any change in a block changes the hash which means it will not match the hash recorded in the next data block so the transaction fails
 	
3.5 Tamper-proof:
 	
• decentralised ledger
• the network
• ensured immutability
• consensus protocol

Delivery and assessment guidance
1.2 Learner could create a timeline showing milestones in key technologies of blockchain. **2.1** Learners could explore and/or create diagrams to show how a decentralised ledger works.

Unit 02 Understanding security practices in blockchain (D/650/1457)

Unit summary			
In this unit, the learner will understand security practices in blockchain. They will understand the basics of cryptography including the history of ciphers and how cryptography works. They will also know about transactions in blockchain and understand how consensus mechanisms validate ledgers.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**30 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Understand the basics of cryptography	1.1 Explain the **history of ciphers**
	1.2 Provide examples of **ciphers in practice**
	1.3 Explain why **cryptography** is important to blockchain
	1.4 Describe **how cryptography works**, including: • hash function • public key • private key
	1.5 Identify real world applications of encryption
2. Know about transactions in blockchain	2.1 Identify transactional properties in blockchain
	2.2 Explain how a transaction works
	2.3 Identify **types of transactions**
3. Understand how consensus mechanisms validate ledgers	3.1 Describe the role of the **node** on the network
	3.2 Describe how validation has evolved over time
	3.3 Explain the objectives of a consensus mechanism
	3.4 Identify the weaknesses of proof of work as a consensus mechanism
	3.5 Compare **common consensus mechanisms**

Range
1. Understand the basics of cryptography
1.1 History of ciphers must include: • encryption • decryption **1.2 Ciphers in practice:** Learners must provide examples of at least 2 ciphers and how they are used in practice. Ciphers could include: • classical ciphers (for example, Caesar, symbol) • mechanical ciphers (for example, Lorenz) • modern ciphers (for example, ciphers that date from 1900 or later)

Range
1.3 Cryptography must include reference to: • the Merkle tree • symmetric keys • asymmetric keys: ○ public and private key pairs **1.4 How cryptography works:** Learners must show an understanding of what is meant by hash function, its role on a blockchain and the benefits of hashing. • uniqueness • deterministic • speed of the transaction The learner will describe how key pairs and hash functions work together.
2. Know about transactions in blockchain
2.3 Types of transactions: Learners must identify at least 3 types of transactions. • ownership • validation • confirmation of actions • cost/price • asset
3. Understand how consensus mechanisms validate ledgers
3.1 Node must include: • miner – proof of work • validator – proof of stake **3.5 Common consensus mechanisms:** Learners must compare 2 common consensus mechanisms, these could include: • proof of work • proof of stake • delegated proof of stake • Byzantine fault tolerance • proof of authority (enterprise blockchain validation)

Delivery and assessment guidance
3.5 Learner could be provided with a case study. They could evaluate current, common consensus mechanisms and make recommendations.

Unit 03 Introduction to the use of programming for blockchain (F/650/1458)

Unit summary			
In this unit, learners will gain knowledge of programming languages and different programming methodologies. Learners will also gain an understanding of basic programming concepts. They will know about methods of testing code and will be able to create a solution to a set problem.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**50 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Know about programming languages	1.1 Explain the term programming
	1.2 Compare different **programming methodologies**
	1.3 Identify **suitable blockchain programming languages**
	1.4 Define what is meant by **syntax**
2. Understand basic programming concepts	2.1 Provide examples of basic **algorithms**
	2.2 Identify the principles of **pseudocode**
	2.3 Explain the purpose of flowcharts
	2.4 Explain the key purpose of **data types** in programming
	2.5 Identify **key principles** for writing code
3. Know about methods of testing code	3.1 Identify what is meant by a bug in relation to programming
	3.2 Describe what is meant by **debugging**
	3.3 Identify **methods of debugging**
	3.4 Identify **methods of testing**
4. Be able to create a solution to a set problem	4.1 Identify a **problem**
	4.2 Create a flowchart to structure a problem
	4.3 Develop pseudocode in relation to a flowchart
	4.4 Select appropriate testing for the solution created
	4.5 Reflect on **solution** proposed

Range
1. Know about programming languages
1.2 Programming methodologies: Learners must compare as a minimum: • procedural • object oriented **1.3 Suitable blockchain programming languages** for example: • JavaScript • Python • Solidity • Java

Range
• PHP **1.4 Syntax:** A set of rules, structured into expressions or statements which define a combination of symbols in a specific programming language. Elements of advanced syntax could also include: • types • conditional statements • passing of arguments • reserved words
2. Understand basic programming concepts

2.1 Algorithms:
 	
A set of rules that defines a sequence of operations that must be in the correct order. Common examples could include:
 	
• input and output
• modelling
• data structures
• sort and search
• heuristic
• combinatorial
• indentation
 	
2.2 Pseudocode:
 	
• focus on algorithmic ideas and steps
• steps are in plain English
• more precise than human language but without specific programming language syntax
• has no defined symbols or processes however, a range of common standards exist
• no broad standards as pseudocode is not executable
 	
2.4 Data types must include:
 	
• primitives
• Booleans
 	
Could also include:
 	
• JavaScript:
  ○ string
  ○ numbers
  ○ undefined
  ○ NULL
• Python:
  ○ string
  ○ numbers

Range
○ list ○ tuple ○ dictionary • Other: ○ character ○ integer ○ float **2.5 Key principles** must include: • variables • functions • iteration • arguments • objects and classes • operations
3. Know about methods of testing code
3.2 Debugging: Debugging code to ensure it functions correctly, returns no errors. **3.3 Methods of debugging:** • breakpoints • error finding • indentation and compilation processes • IntelliSense **3.4 Methods of testing** must include: • functional programming testing • unit testing • black box and white box testing • system integration testing (SIT) • user acceptance testing (UAT) • operational acceptance testing (OAT) • performance testing (PT) • penetration testing (pen test)
4. Be able to create a solution to a set problem
4.1 Problem must include: • identification • capture • structuring

Range
4.5 Solution: • applying testing methods • iterative reflection • communication

Delivery and assessment guidance
Learners must understand basic computer terminology used in programming. Learners should be aware of programming acronyms and terminology used and key principles in programming. **2.4** Learners must understand how syntax and data types change between programming languages. **2.5** Learners must be aware of the 'secure by design' approach that seeks to ensure any code has no vulnerabilities that could be exploited to allow unauthorised access/manipulation.

Unit 04 Understanding smart contracts (H/650/1459)

Unit summary			
In this unit, learners will know about different types of smart contracts, their uses and purposes. They will understand the application of blockchain for securing data and value and will know how to create, deploy and execute smart contracts.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**25 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Know about types of smart contracts and their uses	1.1 Identify **types** of smart contract
	1.2 Describe uses for smart contracts
2. Know the purpose of smart contracts	2.1 Identify restrictions of bitcoin blockchain
	2.2 Describe the **structure** of a smart contract
	2.3 Explain the basic functionality of a smart contract
	2.4 Compare the capabilities of current day cryptocurrency to those of bitcoin
	2.5 Identify the trade-offs between simplicity and complexity within cryptocurrencies
3. Understand the application of blockchain for securing data and value	3.1 Explain how the Ethereum network demonstrates the extended capabilities of blockchain to secure data
	3.2 Identify types of data the Ethereum network can secure
	3.3 Explain the **function of InterPlanetary File System (IPFS)**
4. Understand how to create a smart contract	4.1 Explain how to create a smart contract including: • **define** • **design** • **code**
5. Know how to deploy and execute a smart contract	5.1 Explain the process to **deploy and execute** a smart contract

Range
1. Know about types of smart contracts and their uses
1.1 Types: • smart legal • business • contractual obligations

Range
2. Know the purpose of smart contracts
2.2 Structure: A standard Ethereum contract could contain: • state variables • modifiers and functions • events and logs • struct types • enum types • inheritance • data • storage • memory
3. Understand the application of blockchain for securing data and value

3.3 Function of IPFS:
 	
• network for storing and sharing data:
  ○ distributed
  ○ secure
  ○ sharded storage
  ○ content addressing to identify files in a global namespace, akin to primary keys in databases

4. Understand how to create a smart contract

4.1
• **Define:**
  ○ define the transaction that is to be automated
• **Design:**
  ○ flowcharts and pseudocode
• **Code:**
  ○ choice of language, functions and variables

5. Know how to deploy and execute a smart contract
5.1 Deploy and execute: Test the platform and test and implement the transaction.

Delivery and assessment guidance
1.2 Learners must describe a minimum of 2 uses. Learners can research how smart contracts are used in various applications. **2.5** Learners could be provided with cases studies whereby trade-offs between simplicity and complexity within cryptocurrencies can be identified. **4.1** Learners can base their explanation on a use described in AC 1.2 and could reflect on a pre-existing smart contract.

Delivery and assessment guidance
Learners do not have to demonstrate their knowledge by creating a smart contract but may do so if they wish. Learners could explain how to create a smart contract by creating a flowchart showing each stage of the process.

Unit 05 Blockchain challenges (L/650/1460)

Unit summary			
In this unit, learners will understand the environmental impact of blockchain and know about the challenges it faces in relation to scale, speed and storage. Learners will also know about regulation and legislation in relation to blockchain and crypto assets.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**25 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Understand the environmental impact of blockchain	1.1 Identify **environmental implications** of different blockchains
	1.2 Consider ways that validators can **optimise energy usage**
	1.3 Consider how blockchain energy usage could **achieve net zero**
2. Know about challenges in relation to scale, speed and storage of blockchain	2.1 Explain how blockchain could **evolve** to address the needs of a growing user base
	2.2 Identify how blockchain can be **optimised** to cater for the demands placed upon it of a global organisation
3. Know about regulation and legislation in relation to blockchain and crypto assets	3.1 Explain why regulation is an important part of blockchain's adoption and success
	3.2 Describe types of **crypto assets**
	3.3 Explain the importance of cryptocurrency regulation
	3.4 Identify how **worldwide legislation** applies to the use of blockchain

Range

1. Understand the environmental impact of blockchain

1.1 Environmental implications:

Learners must identify a minimum of 3 environmental implications of different blockchains.

1.2 Optimise energy usage:

- different consensus protocols
- off peak
- renewable energy sources
- hardware
- virtualisation
- hyperconverged systems
- geographical location

1.3 Achieve net zero:

- signatories to the Crypto Climate Accord
- smart grid technology
- Green Jobs Taskforce
- energy efficiency

Range
• carbon capture and storage • alternative fuels (for example, hydrogen)
2. Know about challenges in relation to scale, speed and storage of blockchain
2.1 Evolve: • increasing nodes • side chains • level 1, level 2 chains • compression (for example, the Merkle tree or preferred data types) **2.2 Optimised:** • powerful servers: ○ use of hyperconverged systems that allows modular upgrades • refactoring code • use of smart contracts
3. Know about regulation and legislation in relation to blockchain and crypto assets
3.2 Crypto assets: Learners will describe a minimum of 3 types of crypto assets. **3.4 Worldwide legislation** to include: • legal status • jurisdiction

Delivery and assessment guidance
2.2 Tutors could provide learners with a case study showing how a business process has been changed to be more efficient using blockchain technology (for example, Visa).

Unit 06 Blockchain opportunities (M/650/1461)

Unit summary			
In this unit, learners will gain knowledge of how blockchain can support business and communities. They will know about non-fungible tokens (NFTs) as well as how blockchain works with other technologies.			
Assessment			
This unit is internally assessed via a portfolio of evidence.			
Mandatory	**Achieved/not yet achieved**	**Level 3**	**30 GLH**

Learning outcomes The learner will:	**Assessment criteria** The learner can:
1. Understand how business can be supported by blockchain	1.1 Explain how blockchain can support **business transformation** projects
	1.2 Describe **areas of improvement** to an **industry** that blockchain could support
	1.3 Explain the properties of blockchain that are most important in ensuring these improvements can be implemented
2. Know how blockchain works with other technologies	2.1 Identify how blockchain works with **other technologies**
	2.2 Identify other technological components which support business improvement in conjunction with blockchain
3. Know about non-fungible tokens (NFTs)	3.1 Define what is meant by an NFT
	3.2 Explain how NFTs work
	3.3 Identify the **impact of NFTs on a chosen industry**
4. Know how blockchain could support communities	4.1 Explain how blockchain might support: • **society and culture** • **sustainability** • **smart cities**

Range
1. Understand how business can be supported by blockchain
1.1 Business transformation: • cyber security • data integrity • sensitive customer information • identification • asset tracking **1.2 Areas of improvement:** Learners must describe a minimum of 2 areas of improvement: • generate revenue • reduce costs • time spent • increased security

Range
• immutability • audit trail for regulatory reporting **1.2 Industry:** • manufacturing • media • entertainment • finance • healthcare • food • supply chain • energy, oil and gas • property/real estate • data storage • government
2. Know how blockchain works with other technologies
2.1 Other technologies: Learners must identify how blockchain works with a minimum of 3 other technologies. • quantum computing • digital twins and non-fungible tokens (NFTs) • 5G • artificial intelligence (AI) • e-commerce • internet of things • secure data sharing
3. Know about non-fungible tokens (NFTs)

3.3 Impact of NFTs on a chosen industry:
 	
• gaming
• collectibles
• art:
  ○ music
  ○ video
  ○ digital media
• education
• property/real estate

4. Know how blockchain could support communities
4.1 Society and culture: • future of work • health and wellbeing • education

Range
• leisure • tourism and hospitality • art (generative) **4.1 Sustainability:** • transport • clean air • energy • environment: ○ carbon footprint **4.1 Smart cities:** • urban living • integrity over all transactions • efficient management of resources • increased transparency • increased connectivity • participation (for example, voting)

Delivery and assessment guidance
1.1 Learners could explain how blockchain can support business transformation projects within their area of employment or potential future employment. **1.2** Learners could describe 2 areas of improvement that blockchain could support within their own industry or an area of interest. **2.2** Learners could research how other technological components have supported business improvement for a business of their choice. **3.3** Tutors could provide a case study or learners could research NFT use cases within their own industry or areas of interest.

Assessment strategies and principles relevant to this qualification

The units we offer have been developed in line with the specific assessment strategies or principles of different Sector Skills Councils (SSCs) or by us where there is no SSC lead.

The key requirements of the assessment strategies or principles that relate to units in this qualification are summarised below.

The centre needs to ensure that individuals undertaking assessor or quality assurer roles within the centre conform to the SSC or our assessment requirements for the unit they are assessing or quality assuring.

Assessment strategy

Knowledge learning outcomes:

- assessors will need to be both occupationally knowledgeable and qualified to make assessment decisions
- internal quality assurers will need to be both occupationally knowledgeable and qualified to make quality assurance decisions

Competence/skills learning outcomes:

- assessors will need to be both occupationally competent and qualified to make assessment decisions
- internal quality assurers will need to be both occupationally knowledgeable and qualified to make quality assurance decisions

Section 3: explanation of terms

This table explains how the terms used at level 3 in the unit content are applied to this qualification (not all verbs are used in this qualification).

Apply	Explain how existing knowledge can be linked to new or different situations in practice.
Analyse	Break the subject down into separate parts and examine each part. Show how the main ideas are related and why they are important. Reference to current research or theory may support the analysis.
Clarify	Explain the information in a clear, concise way.
Classify	Organise according to specific criteria.
Collate	Collect and present information arranged in sequential or logical order.
Compare	Examine the subjects in detail and consider the similarities and differences.
Critically compare	This is a development of compare where the learner considers the positive aspects and limitations of the subject.
Consider	Think carefully and write about a problem, action or decision.
Demonstrate	Show an understanding by describing, explaining or illustrating using examples.
Describe	Write about the subject giving detailed information in a logical way.
Develop (a plan/idea which…)	Expand a plan or idea by adding more detail and/or depth of information.
Diagnose	Identify the cause based on valid evidence.
Differentiate	Identify the differences between 2 or more things.
Discuss	Write a detailed account giving a range of views or opinions.
Distinguish	Explain the differences between 2 or more items, resources, or pieces of information.
Draw conclusions (which…)	Make a final decision or judgement based on reasons.
Estimate	Form an approximate opinion or judgement using previous knowledge or considering other information.

Evaluate	Examine strengths and weaknesses, arguments for and against and/or similarities and differences. Judge the evidence from the different perspectives and make a valid conclusion or reasoned judgement. Reference to current research or theory may support the evaluation.
Explain	Provide detailed information about the subject with reasons showing how or why. Responses could include examples to support these reasons.
Extrapolate	Use existing knowledge to predict possible outcomes that might be outside the norm.
Identify	Recognise and name the main points accurately (some description may also be necessary to gain higher marks when using compensatory marking).
Implement	Explain how to put an idea or plan into action.
Interpret	Explain the meaning of something.
Judge	Form an opinion or make a decision.
Justify	Give a satisfactory explanation for actions or decisions.
Perform	Carry out a task or process to meet the requirements of the question.
Plan	Think about and organise information in a logical way using an appropriate format.
Provide	Identify and give relevant and detailed information in relation to the subject.
Reflect	Learners should consider their actions, experiences or learning and the implications of this for their practice and/or professional development.
Review and revise	Look back over the subject and make corrections or changes.
Select	Make an informed choice for a specific purpose.
Show	Supply evidence to demonstrate accurate knowledge and understanding.
State	Give the main points clearly in sentences or paragraphs.
Summarise	Give the main ideas or facts in a concise way.

Section 4: support

Support materials

The following support materials are available to assist with the delivery of this qualification and are available on the NCFE website:

- learner's evidence tracking log (LETL)
- learning resources
- qualification factsheet

Useful websites

Centres may find the following websites helpful for information, materials and resources to assist with the delivery of this qualification:

- eth.build
- cryptoclimate.org
- cryptozombies.io
- trufflesuite.com/ganache
- www.w3schools.com/

These links are provided as sources of potentially useful information for delivery/learning of this subject area. NCFE do not explicitly endorse any learning resources available on these websites. For official NCFE endorsed learning resources, please see the additional and teaching materials sections on the qualification page on the NCFE website.

Other support materials

The resources and materials used in the delivery of this qualification must be age-appropriate and due consideration should be given to the wellbeing and safeguarding of learners in line with your institute's safeguarding policy when developing or selecting delivery materials.

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To continue to improve our levels of customer service, telephone calls may be recorded for training and quality purposes.

Appendix A

Units

To simplify cross-referencing assessments and quality assurance, we have used a sequential numbering system in this document for each unit.

Knowledge only units are indicated by a star. If a unit is not marked with a star, it is a skills unit or contains a mix of knowledge and skills.

Mandatory units

	Unit number	Regulated unit number	Unit title	Level	GLH	Notes
☆	Unit 01	A/650/1456	Introduction to blockchain	3	25	
☆	Unit 02	D/650/1457	Understanding security practices in blockchain	3	30	
	Unit 03	F/650/1458	Introduction to the use of programming for blockchain	3	50	
☆	Unit 04	H/650/1459	Understanding smart contracts	3	25	
☆	Unit 05	L/650/1460	Blockchain challenges	3	25	
☆	Unit 06	M/650/1461	Blockchain opportunities	3	30	

The units above may be available as stand-alone unit programmes. Please visit our website for further information.