IT

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KS4 PERFORMANCE TABLES

Specification

OCR Level 1/Level 2

Cambridge National in IT

J836

Version 1 (First teaching September 2022)

ocr.org.uk/cambridgenationals

Cambridge Nationals

OCR
Oxford Cambridge and RSA

Contents

1 Why choose OCR?

Choose OCR and you've got the reassurance that you're working with one of the UK's leading exam boards. We have developed our specifications in consultation with teachers, employers and subject experts to provide students with a qualification that's relevant to them and meets their needs.

We're part of the Cambridge Assessment Group, Europe's largest assessment agency and a department of the University of Cambridge. Cambridge Assessment plays a leading role in developing and delivering assessments throughout the world, operating in over 150 countries.

We work with a range of education providers, including schools, colleges, workplaces and other institutions in both the public and private sectors. Over 13,000 centres choose our A Levels, GCSEs and vocational qualifications including Cambridge Nationals and Cambridge Technicals.

1.1 Our specifications

We believe in developing specifications that help you bring the subject to life and inspire your students to achieve more**.** We've created teacher-friendly specifications based on extensive research and engagement with the teaching community.

They're designed to be straightforward and accessible so that you can tailor the delivery of the course to suit your needs.

1.2 Our support

We have a range of support services to help you at every stage, from preparation to delivery.

- A wide range of high-quality creative resources including resources created by leading organisations within the industry
- Textbooks and teaching and learning resources from leading publishers. For more information about all the published support for the Cambridge Nationals that has been endorsed by OCR please go to the Cambridge Nationals page on our website
- Professional development for teachers to fulfil a range of needs. To join our training (either face-to-face or online) or to search for training materials, please go to the Professional Development page on our website
- Active Results is our free results analysis service to help you review the performance of individual students or whole schools
- ExamBuilder is our free question-building platform that helps you to build your own tests using past OCR exam questions
- OCR subject advisors provide information and support to centres including specification and non-exam assessment advice, updates on resources developments and a range of training opportunities. They work with subject communities through a range of networks to share ideas and expertise to support teachers

Further help and support

Whether you are new to OCR or already teaching with us, you can find useful information, help and support on our website. Or get in touch:

support@ocr.org.uk

@ocr_exams

01223 553998

1.3 Aims and learning outcomes

Our Cambridge National in IT will encourage students to:

- understand and apply the fundamental principles and concepts of IT, including the use of IT in the digital world, Internet of Everything, data manipulation and Augmented Reality
- understand, apply and use IT appropriately and effectively for the purpose and audience
- develop learning and practical skills that can be applied to real-life contexts and work situations
- think creatively, innovatively, analytically, logically and critically
- develop independence and confidence in using skills that would be relevant to the IT sector and more widely
- plan, design, create, test and evaluate/review IT solutions and products which are fit for purpose and meeting user/client requirements and apply design and Human Computer Interface (HCI) considerations appropriate for a defined audience
- understand the impacts of digital technologies on the individual, organisation and wider society.

1.4 What are the key features of this specification?

The key features of OCR's Cambridge National in IT for you and your students are:

- a simple and intuitive assessment model, consisting of an externally assessed unit that focuses on knowledge and understanding and two skills-based, non examined assessment units (NEA)
- a specification developed with teachers specifically for teachers. The specification lays out the subject content clearly
- a flexible support package formed after listening to teachers' needs. The support package will help teachers to easily understand the requirements of the qualification and how it is assessed
- a team of OCR Subject Advisors who support teachers directly and manage the qualification nationally
- the specification has been designed to support progression onto Level 2 and Level 3 qualifications including Cambridge Technicals in Information Technology, Cambridge Technicals in Digital Media, Digital apprenticeships and Digital T-levels.

This qualification will help students to develop:

- a deep understanding in the use of IT in the digital world and how to apply design tools, principles of human computer interactions, the use of data and testing, cyber-security and legislation when creating an IT solution or product
- technical skills which can be used to plan, design, create, test and evaluate/review IT solutions and Augmented Reality (AR) products that are appropriate for a defined target audience and meet requirements.

All Cambridge Nationals qualifications offered by OCR are regulated by Ofqual, the Regulator for qualifications offered in England. The qualification number for OCR's Cambridge National in IT is QN 603/7115/8.

2 Qualification overview

2.1 OCR Level 1/Level 2 Cambridge National in IT at a glance

Qualification number	603/7115/8	**OCR Entry code**	J836
First entry date	01/09/2022	**Approved age range**	14-16
Guided learning hours (GLH)	120	**Performance information**	We've designed this qualification to meet the Department for Education (DfE) requirements for qualifications in the Technical Award category of the 14-16 performance tables.
Total qualification time (TQT)	160	**Eligible for funding**	It's designed to meet the funding requirements of a 14-16 study programme.
This qualification is suitable for students	• aged 14-16 on a full-time study programme wanting to develop applied knowledge and practical skills suitable for use within the IT sector • who want to progress onto other related study, such as vocational qualifications in Information Technology, A-Levels, T-Levels and apprenticeships • as it is designed to meet the Department for Education's characteristics for a Technical Award		
Entry requirements	There is no requirement for students to achieve any specific qualifications before taking this qualification.		
Qualification requirements	Students must complete three units: • one externally assessed unit • two NEA units		
Assessment method/ model	Unit R050 is assessed by an exam and marked by us. You will assess the NEA units and we will moderate them.		
Assessment series each year	• January • June		
Terminal assessment	The exam must be taken in the final assessment series before qualification certification. The result from the exam taken in the final series will be the one that counts towards a student's overall grade.		
Grading	All results are awarded on the following scale: Level 2 – Distinction* (*2), Distinction (D2), Merit (M2), Pass (P2) Level 1 – Distinction (D1), Merit (M1), Pass (P1) and Fail/Unclassified.		
Exam resits	Students can resit the exam but the result from the exam taken in the series where students certificate would be the result to count towards performance measures.		
Repeat submission of students' NEA work	If you and your students feel they have not performed at their best during assessment of the NEA units, the students can, at your discretion, improve their work and resubmit it to you for assessment. You must be sure it's in the students' best interests to re-attempt the assessment. There is one re-submission opportunity. All work submitted (or re-submitted) must be based on the assignment that is live for the submission series. For information about feedback see section 6. The final piece of work must be completed solely by the student and teachers must not detail specifically what amendments should be made.		

2.2 Qualification Structure

For this qualification, students must achieve **three** units: one externally assessed and two Non Examined Assessment (NEA) units.

Key to units for this qualification:

M = Mandatory	Students must achieve this unit
E = External assessment	We set and mark the exam
N = NEA	You assess this and we moderate it

Unit no.	Unit title	Unit ref. no. (URN)	Guided learning hours (GLH)	How are they assessed?	Mandatory or optional
R050	IT in the digital world	M/618/6129	48	E	M
R060	Data manipulation using spreadsheets	H/618/6130	36	N	M
R070	Using Augmented Reality to present information	K/618/6131	36	N	M

OCR
Oxford Cambridge and RSA

OCR Level 1/Level 2 Cambridge National in IT

Qualification number: 603/7115/8

Type of qualification: Technical Award

Overview

Who is this qualification for?

The OCR Level 1/Level 2 Cambridge National in IT is aimed at students aged 14-16 years and will develop knowledge, understanding and practical skills that would be used in the IT sector.

You may be interested in this if you want an engaging qualification where you will use your learning in practical, real-life situations, such as:

- using different applications and tools to design, create and evaluate IT solutions and products
- creating a data manipulation solution
- creating an Augmented Reality prototype.

This will help you to develop independence and confidence in using skills that would be relevant to the IT sector.

The qualification will also help you to develop learning and skills that can be used in other life and work situations, such as:

- planning and designing IT solutions and products for a given purpose
- selecting the best tools and techniques to solve a problem
- solving problems by exploring different software application tools and techniques
- creating IT solutions and digital products
- use of planning techniques to complete tasks in an organised and timely way
- finding imaginative ways to solve IT problems.

This qualification will complement other learning that you're completing for GCSEs or vocational qualifications at Key Stage 4 and help to prepare you for further study. More information about this is given below.

What will you study as part of the qualification?

You will study three mandatory units:

- **R050: IT in the digital world**
  This is assessed by taking an exam.

  In this unit you will learn about design and testing concepts for creating an IT solution or product, and the uses of IT in the digital world. Topics include:

  - Design Tools
  - Human Computer Interface (HCI) in everyday life
  - Data and testing
  - Cyber-security and legislation
  - Digital Communications
  - Internet of Everything (IoE).

- **R060: Data manipulation using spreadsheets**
  This is assessed by completing a set assignment.

  In this unit you will learn how to plan, design, create, test and evaluate a data manipulation spreadsheet solution to meet client's requirements. You will be able to evaluate your solution based on the user requirements. Topics include:

  - Planning and designing the spreadsheet solution
  - Creating the spreadsheet solution
  - Testing the spreadsheet solution
  - Evaluating the spreadsheet solution.

- **R070: Using Augmented Reality to present information**
  This is assessed by completing a set assignment.

  In this unit you will learn how to design, create, test and review an Augmented Reality model prototype to meet a client's requirements. Topics include:

  - Augmented Reality (AR)
  - Designing an Augmented Reality (AR) model prototype
  - Creating an Augmented Reality (AR) model prototype
  - Testing and reviewing.

What knowledge and skills will you develop as part of this qualification and how might these be of use and value in further studies?

This qualification will enable you to learn about the different design tools that can be used, the principles of human computer interfaces and the use of data and testing when creating IT solutions or products. You will also understand the uses of Internet of Everything and the application of this in everyday life.

You will develop the skills to plan and design a spreadsheet solution to meet a client's requirements. You will be able to use a range of tools and techniques to create the spreadsheet solution which will be tested, and you will learn to evaluate your spreadsheet solution.

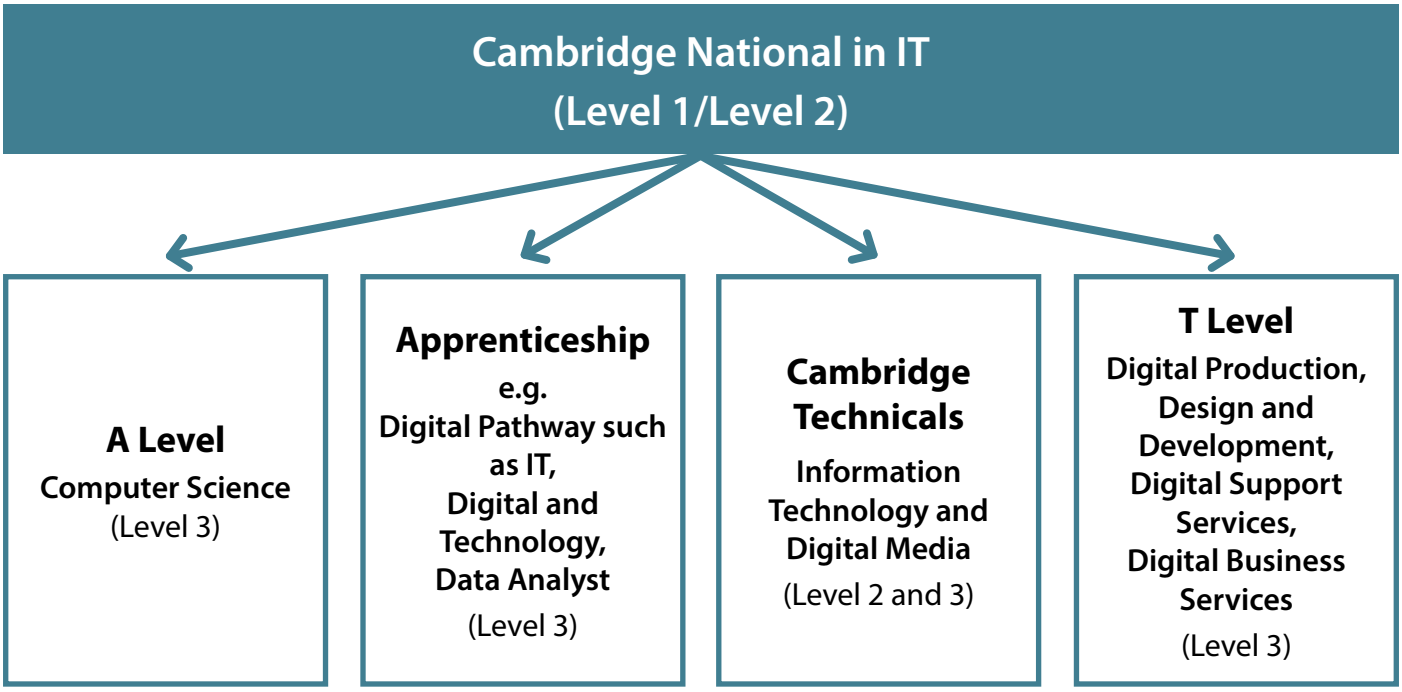
Finally, you will develop the knowledge and skills relating to the purpose, use and types of Augmented Reality (AR) in different contexts and how it is used on different digital devices. You will develop the skills to design, create, test and review an AR model prototype.

This will provide you with the learning for a range of IT related further study, important transferable skills and some basic industry knowledge and skills.

The knowledge and skills developed will help you to progress onto a range of academic, technical and applied post-16 study including:

- A-Level Computer Science
- Level 3 Technical and Applied General Qualifications, such as the Cambridge Technical in Information Technology, Cambridge Technical in Digital Media
- T-Level in Digital Production, Design and Development, Digital Support Services, Digital Business Services
- Digital Apprenticeships, such as IT, Digital and Technology, Data Analyst
- other Level 2 qualifications, such as the Cambridge Technical in Information Technology, Cambridge Technical in Digital Media.

The diagram below shows the possible route for your further study:



Which subjects will complement this course?

- OCR Level 1/Level 2 Cambridge National in Creative iMedia
- GCSE Computer Science
- GCSE Media Studies
- GCSE Business Studies.

Further details

More information about the Cambridge National in IT can be found in these documents:

- Specification
- SAM
- Exploring our exam: a guide to our sample assessment material
- Students Guide to NEA assignments

3 About this qualification

3.1 Qualification size (GLH and TQT)

The size of the qualification is described in terms of Guided Learning Hours (GLH) and Total Qualification Time (TQT).

GLH indicates the approximate time (in hours) the teacher will spend supervising or directing study and assessment activities. We have worked with people who are experienced in delivering related qualifications to determine the content that needs to be taught and how long it will take to deliver.

TQT includes two parts:

- GLH
- an estimate of the number of hours a student will spend on unsupervised learning or assessment activities (including homework) to successfully achieve their qualification.

The OCR Level 1/Level 2 Cambridge National in IT is 120 GLH and 160 TQT.

3.2 Language

This qualification and its assessment materials are available in English only.

Only answers provided in English will be assessed.

3.3 Performance information

We've designed this qualification to meet the Department for Education (DfE) requirements for qualifications in the Technical Award category of the 14-16 performance tables.

You'll find information on performance tables for England on the Department for Education website.

4 Units

4.1 Guidance on unit content

This section describes what must be taught so that students can access all available marks.

4.1.1. Externally Assessed Unit (R050)

The externally assessed unit is made up of a number of topic areas. Each topic area has related teaching content that must be taught. A direct question may be asked about any content in the teaching content column.

The breadth and depth column helps to clarify the breadth and depth of teaching needed, and indicates the range of knowledge and understanding that may be assessed in the exam. This column also confirms any aspects that you do **not** need to teach in relation to the content as 'does not include' statements.

Knowledge and understanding

Students will need to **understand** the content unless the breadth and depth column identifies it as knowledge only.

- Any item(s) that should be taught as knowledge only will start with the word 'know' in the breadth and depth column.
- All other content is expected to be taught as understanding.

The table below explains what we mean by knowledge and understanding.

Knowledge	• Be able to identify or recognise a given item, for example on a diagram • Use direct recall to answer a question, for example the definition of a term.
Understanding	• To assess and evidence the perceived meaning of something in greater depth than straight identification or recall • Understanding will be expressed and presented using terms such as: how; why; when; reasons for; benefits and drawbacks of; advantages and disadvantages of; purpose of; suitability of; recommendations for improvement; pros and cons; appropriateness of something to/in different contexts.

Students need to be taught the information in both the teaching content and breadth and depth columns.

4.1.2 NEA Units (R060-R070)

The NEA units are made up of a number of topic areas with associated teaching content which details what must be taught as part of each topic area.

The NEA units also have an exemplification column that provides more information about, and examples relating to, the teaching content. This helps to exemplify the teaching expected so that students are equipped to successfully complete their assignments.

4.1.3 Command words

Appendix B gives information about the command words that will be used in both the external assessments and the NEA marking criteria and the expectations of them.

4.1.4 Performance Objectives (POs):

Each Cambridge National qualification has related Performance Objectives. There are four Performance Objectives in the OCR Level 1/Level 2 Cambridge National in IT.

Performance Objectives	
PO1	Recall knowledge and show understanding
PO2	Apply knowledge and understanding
PO3	Analyse and evaluate knowledge, understanding and performance
PO4	Demonstrate and apply skills and processes relevant to the subject area

PO1 is only relevant to the exam. PO4 is only relevant to the NEA assessments.

The weightings of the Performance Objectives across the units is:

Performance Objective	Externally Assessed unit (range)	NEA units	Overall weighting (range)
PO1	15.5–19%	n/a	15.5–19%
PO2	13–19%	18%	33–37%
PO3	7–9%	12%	20–24%
PO4	n/a	30%	30%
Overall weighting of assessments	**40%**	**60%**	**100%**

4.2 Unit R050: IT in the digital world

Aims

The IT industry is vast and provides work for a wide range of people across sectors, from those working as freelance IT consultants, right through to those in large or specialist IT teams in multinational companies. Job roles frequently overlap across multiple sectors as there are common aspects to inputs, processing and outputs of IT systems which can be used in many ways, from supporting the planning, designing and implementation of services or products to enhancing our daily lives in the digital world.

In this unit you will learn the theoretical knowledge and understanding to apply design tools for applications, principles of human computer interfaces and the use of data and testing in different contexts when creating IT solutions or products. You will understand the uses of Internet of Everything and the application of this in everyday life, cyber-security and legislations related to the use of IT systems, and the different types of digital communications software, devices, and distribution channels.

Unit R050: IT in the digital world

Topic Area 1: Design tools

Teaching content	Breadth and depth
1.1 Types of design tools	
□ Flow charts □ Mind maps ▪ Library ▪ Tunnel timeline ▪ Presentation □ Visualisation diagrams □ Wireframes	To include: • Know the components of each design tool • Know the type of software that can be used to create each design tool • Advantages and disadvantages of each design tool • Creating an original document using relevant design tools either using software or by sketches • Assessing the suitability of an original document to a given context

Topic Area 2: Human Computer Interface (HCI) in everyday life

Teaching content	Breadth and depth
2.1 The purpose, importance and use of HCI in application areas	
□ Banking □ Embedded systems □ Entertainment □ Fitness □ Home appliances □ Retail	To include: • Know the purpose of HCI • Know why HCI is used for each application area • Know the importance of HCI applied to each application area • Advantages and disadvantages of the use of an HCI for each application area
2.2 Hardware considerations	
□ Display ▪ Type ▪ Size □ Resources ▪ Memory ▪ Processing power	To include: • Know the different display types and sizes that an HCI can be used on • The impact of display and resources on the HCI • Advantages and disadvantages of hardware considerations for using an HCI

Unit R050: IT in the digital world

2.3 Software considerations

□ Operating system □ Digital platform ▪ Database ▪ Mobile App ▪ Spreadsheet ▪ Website	To include: • Know how the HCI used on the Windows, Apple macOS, Apple's iOS, Android, Chrome, Ubuntu, Linux and Unix operating systems and software applications will impact on the design • Know how the HCI used on the digital platform will impact on the design

2.4 User interaction methods

□ Gesture □ Keyboard □ Mouse □ Touch □ Voice	To include: • Know how a user will interact with the HCI • Advantages and disadvantages of each user interaction method

Topic Area 3: Data and testing

Teaching content	Breadth and depth
3.1 Information and data	
□ What data is □ What information is □ The relationship between data and information	To include: • Know the difference between data and information • How data is converted to information
3.2 Data use	
3.2.1 Use of data types in different contexts □ Alphanumeric □ Boolean □ Date □ Numeric ▪ Currency ▪ Decimal ▪ Integer ▪ Percentages ▪ Real □ Text	To include: • Know the characteristics of each data type • How each data type can be used • Assess the suitability and justify the use of data types applied to a given context • Alphanumeric is a combination of letters and numbers
3.2.2 The difference between validation and verification	To include: • Know the purposes of validation and verification • The different roles of validation and verification
3.2.3 Data validation tools □ Data type check □ Format check □ Input mask □ Length check □ Limited choice ▪ Drop down list ▪ Radio buttons ▪ Tick list □ Lookup □ Presence check □ Range check	To include: • The purpose of a data validation tool • How a validation tool can reduce user errors

Unit R050: IT in the digital world	
3.2.4 Data verification tools □ Double entry □ Manual checking	To include: • The purpose of a data verification tool • How a verification tool can reduce user errors
3.3 Data collection methods	
□ Primary ▪ Email ▪ Interview ▪ Online Questionnaire and survey □ Secondary ▪ Book ▪ Government Statistics ▪ Magazine ▪ Website	To include: • Know the purpose of each data collection method • Advantages and disadvantages of the data collection methods • Assess the suitability and justify the use of the data collection methods applied to a given context
3.4 Storage of collected data	
□ Logical location ▪ Cloud □ Physical location ▪ Internal storage device o Primary Hard Drive o Network Drive ▪ External storage device o Portable external Hard Drive Disc (HDD) o Portable Solid-State Drive (SSD) o Network-attached storage (NAS) device o Portable USB Flash Drives o Portable Wireless Drives	To include: • Advantages and disadvantages of each storage location • Know the characteristics of each storage device • Advantages and disadvantages of each storage device
3.5 Application of testing to a range of contexts	
3.5.1 Importance and purpose of testing	To include: • Know why testing is needed • The effects of not testing on the final product • Advantages and disadvantages of testing
3.5.2 Test data □ Extreme □ Invalid (Erroneous) □ Valid	To include: • Know what each type of test data is • The role of each type of test data during testing
3.5.3 Types of testing □ Technical □ User	To include: • Advantages and disadvantages of each type of testing • Know what technical testing is • Know what tests can be used in technical testing • Know what user testing is • Know what tests can be used in user testing

Unit R050: IT in the digital world

Topic Area 4: Cyber-security and legislation

Teaching content	Breadth and depth
4.1 Threats	
□ Denial of service (DoS) □ Hacking including ▪ Black Hat ▪ Grey Hat ▪ White Hat □ Malware including ▪ Adware ▪ Botnet ▪ Ransomware ▪ Spyware ▪ Trojan Horse ▪ Virus ▪ Worm □ Social Engineering including ▪ Baiting ▪ Phishing ▪ Pretexting ▪ Quid Pro Quo ▪ Scareware ▪ Shoulder Surfing	To include: • Know the definition of each type of threat • Why the threats are used by attackers • How the threat can occur • How the threat works • How each type of social engineering can be used to gather data and information • How to mitigate against the threats
4.2 The impacts of a cyber-security attack on individuals and/or organisations	
□ Data destruction □ Data manipulation □ Data modification □ Data theft – in transit and at rest □ Denial of service (DoS) to authorised others □ Identify theft	To include: • Know what each impact is • How the impact can affect an individual and an organisation
4.3 Prevention Measures	
□ Physical ▪ Biometric devices ▪ Firewalls ▪ Keypads ▪ Radio-frequency identification (RFID) ▪ Secure backups □ Logical ▪ Access rights and permissions ▪ Anti-virus / malware software ▪ Two-Factor Authentication (2FA) ▪ Encryption ▪ Firewalls ▪ Secure backups ▪ Usernames & passwords □ Secure Destruction of data ▪ Data erasure ▪ Data sanitation ▪ Magnetic wipe ▪ Physical destruction	To include: • Know how each prevention measure works • How the prevention measures keeps data and devices secure • How the prevention measures can be used to mitigate against security risks

Unit R050: IT in the digital world

4.4 Legislation related to the use of IT systems

□ Computer Misuse Act
□ Copyright, Designs and Patents Act
□ Data Protection Act
□ Freedom of Information Act
□ Health & Safety at Work Act
	To include:
	• Know the purpose of the legislation
	• Know how / what is required of individuals / business to comply with each area of legislation
	• The implications of the legislation for:
	  ○ data and information
	  ○ individuals
	  ○ organisations
	• Know how the legislation can be used when dealing with cyber-security issues
	
	Students must keep up to date with any changes in the Acts or additional Act(s) that are relevant to the IT sector
	
	Does not include:
	• Detailed knowledge of the legislations

Topic Area 5: Digital communications

Teaching content	Breadth and depth
5.1 Types	
□ Audio □ Collaboration tools □ Leaflet □ Infographics □ Newsletters □ Presentations □ Reports □ Social Media □ Video □ Voice over Internet Protocol (VoIP) □ Websites	To include: • Know the purpose of each digital communication • Advantages and disadvantages of each digital communication • Assess the suitability and justify the use of a digital communication applied to a given context
5.2 Software	
□ Desktop Publishing (DTP) □ Standard office applications	To include: • Know the characteristics of the software used to create digital communications • Select and assess software to meet user requirements Students must know that software application can be used on PC, Macs and mobile devices
5.3 Digital devices	
□ Smartphone □ Smart TV □ PC/Laptop □ Tablet □ Smartboard	To include: • Know the characteristics of the digital device • Select and assess the suitability of digital device(s) applied to a given context

Unit R050: IT in the digital world

5.4 Distribution channels

5.4.1 Types of distribution channel □ Cloud □ Email □ Messaging □ Mobile Apps □ Multimedia □ VoIP □ Websites	To include: • Know the characteristics of each type of distribution channel • Advantages and disadvantages of each type of distribution channel • Select and assess, and justify, the suitability of distribution channel(s) applied to a given context
5.4.2 Distribution channel connectivity □ 4G / 5G □ Bluetooth □ Mobile Wi-Fi hotspots □ Wi-Fi □ Wired	To include: • Know the characteristics of each connectivity method • Advantages and disadvantages of each connectivity method • Select and assess the suitability of connectivity method(s) applied to a given context

5.5 Audience demographics

□ Accessibility □ Age □ Gender □ Location	To include: • Select and assess the suitability of the digital communication, distribution channel and connectivity linked to specific audience demographic

Topic Area 6: Internet of Everything (IoE)

Teaching content	Breadth and depth
6.1 Use of IoE	
□ What is the IoE □ The four pillars of the IoE □ The interactivity between the four pillars □ IoE digital interactivity ▪ Device to device ▪ Human to device ▪ How digital devices can be tailored to meet the needs of the user	To include: • Know what is meant by the IoE • Know how the World Wide Web (WWW) and the Internet are used in the use of the IoE • Know the four pillars and understand the interaction between them • Advantages and disadvantages of the IoE • Know about digital interactivity • How devices can be tailored to meet the needs of the end users Students to keep up to date with emerging technologies

Unit R050: IT in the digital world

6.2 Application areas in everyday life

□ Energy Management
□ Health
□ Manufacturing
□ Military / Emergency Services
□ Smart devices
  ▪ Business
  ▪ Home
  ▪ Personal
□ Transport
	To include:
	• Know the purpose of the IoE applied to each application area
	• Advantages and disadvantages of the IoE applied to each application area
	• Assess the suitability of the use of the IoE for each application area
	• The security issues related to the use of the IoE in each application area
	
	The emergency services include:
	• Ambulance
	• Coastguard
	• Fire Service
	• Mountain Rescue
	• Police

Assessment guidance

During the exam, students will be expected to demonstrate their understanding through questions that require the skills of analysis and evaluation in particular contexts.

This unit is assessed by an exam. The exam is 1 hour and 30 minutes. It has two sections – Section A and Section B.

- Section A has 15 marks
- Section B has 55 marks
- The exam has 70 marks in total

This will be conducted under examination conditions. For more details refer to the Administration area.

The Cambridge National in IT 'Exploring our exams: a guide to our sample assessment material' gives more information about the layout and expectations of the exam.

A range of question types will be used in the exam, but it will always require students to use the skills of analysis and evaluation.

Section A	• This will have a range of closed response, multiple choice and short response questions.
Section B	• This will have scenario based questions. • Students will be presented with a short scenario which builds throughout Section B. • Students will apply their knowledge and understanding of IT concepts to produce relevant responses. • Students must make appropriate recommendations for the short scenario provided throughout Section B. These recommendations may relate to any of the topic areas in unit R050. • Students will hand-draw/sketch their visual solution to a problem e.g. mind map, flowchart, visualisation diagram. This will be worth 8 marks. • The extended response question is worth 9 marks. This will be assessed using a level of response mark scheme.

Synoptic assessment

This unit allows students to gain underpinning knowledge and understanding relevant to the qualification and sector. The NEA units draw on and strengthen this learning with students applying their learning in a practical, skills-based way. The synoptic grids at the end of the NEA units show these synoptic links.

More information about synoptic assessment within this qualification can be found in section 5.2 synoptic assessment.

4.3 Unit R060: Data manipulation using spreadsheets

Aims

Data manipulation is an important part of many job roles, supporting development and growth in different sectors. Businesses in different sectors such as IT, finance, retail, hospitality, education and government all manipulate data for different purposes. Spreadsheet applications are commonly used to create input, processing and output solutions which manipulate data.

In this unit you will learn the skills to be able to plan and design a spreadsheet solution to meet client requirements. You will be able to use a range of tools and techniques to create a spreadsheet solution based on your design, which you will test. You will be able to evaluate your solution based on the user requirements.

Unit R060: Data manipulation using spreadsheets

Topic Area 1: Planning and designing the spreadsheet solution

Teaching content	Exemplification
1.1 Design tools	

□ Flow charts
□ Mind maps
□ Story board
□ Visualisation diagram
□ Wireframe
	To include:
	• Produce design documents to create the spreadsheet solution including:
	  ○ Functionality
	  ○ Navigation system
	  ○ Outputs from the system
	• Selection and use of appropriate software tools and techniques to effectively plan the spreadsheet solution

1.2 Human Computer Interface (HCI) design conventions and principles	

1.2.1 Functionality
□ Calculations
□ Sorting
□ Filtering
□ User aids
  ▪ Data entry messages
  ▪ Data validation
	To include:
	• Design the functionalities for the solution
	• Design the calculations using flowcharts to enable others to understand calculations taking place
	• Design meaningful messages to be displayed to end users when errors occur
	
	Does not include:
	• Planning calculations with spreadsheet cell references

Unit R060: Data manipulation using spreadsheets

1.2.2 Types of outputs that clearly present information for an organisation □ Charts □ Lists □ Invoices □ Reports □ Worksheets	To include: • Be familiar with the creation of different types of outputs to meet user/client needs • Design different types of outputs to meet user/client needs using visualisation diagrams and wireframes • Consideration of page layouts properties such as page size, print area, margins, headers/footers, guidelines, orientation and scaling • Consideration of house style/branding, colours, fonts, font styles, font size, alignment, logos/images, cell formatting, chart formatting and labelling • Reports to present information to the client and the end user, consider where the information is coming from
1.2.3 Human Computer Interface (HCI) □ Navigation □ Accessibility □ Colour □ Layout □ Learnability □ Memorability □ Messages □ Purpose □ User perceptions	To include: • Design a clear navigation system that meets the user/client needs using visualisation diagram(s) and/or wireframe(s) • The start-up and flow through the navigation system and being able to navigate back to the main menu • Show consideration of learnability and memorability in the design of the solution navigation • Accessibility considerations of sufficient contrast of text and colours, using meaningful names, screen tips • Layout considerations of use of white space, alignment, location of navigation tools on the user interface

Unit R060: Data manipulation using spreadsheets

Topic Area 2: Creating the spreadsheet solution

Teaching content	Exemplification
2.1 Use spreadsheet tools and techniques to create the solution	
2.1.1 Data handling and manipulation □ Data validation ▪ Lookup ▪ Range check ▪ Text length ▪ Limited choice ○ Drop down lists ○ Radio buttons ○ Tick list □ Cell formatting □ Conditional formatting □ Sorting □ Filters □ Formulae ▪ Operators ▪ Parenthesis □ Relational operators □ Naming cells □ Cell references ▪ Relative ▪ Absolute ▪ Named ▪ Multi-sheet referencing □ Functions □ Pivot tables □ Importing different file types □ Entering different data types □ Data types ▪ Boolean ▪ Date ▪ Time ▪ Text ▪ Numeric ○ Integer ○ Number/Real ○ Currency ○ Percentage ○ Decimal □ Security measures □ Modelling tools	To include: • Create a spreadsheet solution that is fit for purpose • Meaningful worksheet names • Manipulation of data using formulas and functions • Built in functions including SUM, MIN, MAX, AVERAGE, COUNT, IF, COUNTIF, LOOKUP, VLOOKUP, HLOOKUP, AND, OR, DATE, TODAY, SUMIF, SUBTOTAL • Relational operators including =, <, >, <=, >=, <> • Solving formula errors (#DIV/0, #NAME?, #REF! etc) • Effective validation checks within the spreadsheet solution • Naming of cells or a group of cells • Use of appropriate security measures such as lock cells, password protected workbook, worksheet editing • Use of different cell formatting options such as alignment, border, font, shading, text wrap and currency matching the plan and design of the solution • Modelling tools such as what-if and goal seek to predict different outcomes

Unit R060: Data manipulation using spreadsheets

2.1.2 Techniques to generate the outputs □ Charts/graphs □ Page layout properties □ Adjusting row and column settings	To include: • Create outputs which are fit for purpose • Creating and formatting a variety of charts and graphs • Creating output documents that follow the house style and page layout properties as planned and designed • Ensuring the information in the rows and columns headings are visible or hidden as needed
2.1.3 User interface • Buttons • Macros • Hyperlinks • Forms	To include: • Create an interface which is fit for purpose • Methods for users to fully navigate around the solution as planned and designed • Configuring the spreadsheet to display the correct information and/or menu at start up

Topic Area 3: Testing the spreadsheet solution

Teaching content	Exemplification
3.1 Test the user interface and the technical aspects of the spreadsheet solution	
□ Testing during development ▪ Technical testing ▪ Usability testing □ Testing after development ▪ Technical testing ▪ Usability testing □ Test plan documentation □ Types of test data ▪ Extreme ▪ Invalid (Erroneous) ▪ Valid	To include: • Following a given test plan document which includes test number, test description, test data, expected result, actual result, remedial action, retesting • Choose appropriate test data to be used in the test plan • Technical testing: ○ Navigation features ○ Spreadsheet calculations ○ Content included in the output • How to record test results • How and when to retest

Topic Area 4: Evaluating the spreadsheet solution

Teaching content	Exemplification
4.1 Methods used to evaluate the success of the spreadsheet solution	
□ Client requirements □ HCI design principles and conventions	To include: • How suitable the spreadsheet solution is for the requirements of a client • How effectively the visual style has been generated • Has house style been followed • Whether the planned spreadsheet solution has been created • How the navigation system has successfully met the client's requirements Does not include: • User feedback / focus group review / user testing / user acceptance testing

Marking criteria

Section 6.4 provides full information on how to mark the NEA units and apply the marking criteria. The marking criteria command words are further explained in Appendix B *Command words*.

The tables below contain the marking criteria for the tasks for this unit. If a student's work does not meet Mark Band 1 (MB1) criteria for any task, you must award zero marks for that task.

Unit R060 – Topic Area 1: Planning and designing the spreadsheet solution		
MB1: 1–3 marks	**MB2: 4–6 marks**	**MB3: 7–10 marks**
Limited use of design tools and features used to plan the solution, which are under-utilised for the intended purpose	**Adequate** use of design tools and features used to plan the solution, which are mostly utilised for the intended purpose	**Effective** use of design tools and features used to plan the solution, which are fully utilised for the intended purpose
MB1: 1–4 marks	**MB2: 5–8 marks**	**MB3: 9–13 marks**
Limited functional design of spreadsheet solution	**Adequate** functional design of spreadsheet solution	**Effective** functional design of spreadsheet solution
Limited design of system output(s) produced	**Adequate** design of system output(s) produced	**Effective** design of system outputs produced
Limited design of Human Computer Interface	**Adequate** design of Human Computer Interface	**Effective** design of Human Computer Interface

Unit R060 – Topic Area 2: Creating the spreadsheet solution		
MB1: 1–3 marks	**MB2: 4–6 marks**	**MB3: 7–10 marks**
Limited use of tools and techniques used to create the solution which are under-utilised for the intended purpose	**Adequate** use of tools and techniques used to create the solution which are mostly utilised for the intended purpose	**Effective** use of tools and techniques used to create the solution which are fully utilised for the intended purpose
MB1: 1–4 marks	**MB2: 5–8 marks**	**MB3: 9–13 marks**
The solution allows **limited** interaction between user and spreadsheet to meet the needs of the scenario	The solution allows **adequate** interaction between the user and spreadsheet to meet the needs of the scenario	The solution allows **effective** interaction between the user and spreadsheet to fully meet the needs of the scenario
The solution contains **inefficient** processes that affects the accuracy and quality of the data produced	The solution contains some **inefficiencies**, but these do not affect the accuracy and quality of the data produced	The solution contains **efficient** processes that generates accurate and high-quality data
The information presented is **limited** in relevance and accuracy	The information presented is **partly** relevant and clear, but is open to misinterpretation	The information presented is **fully** relevant to the scenario needs and clear in its message

Unit R060 – Topic Area 2: Creating the spreadsheet solution		
	Data integrity is preserved using a **limited range** (one or two) tools and techniques Future predictions are **partially** generated using the solution developed	Data integrity is preserved using a **range** of tools and techniques. Future predictions are **fully** generated using the solution developed

Unit R060 – Topic Area 3: Testing the spreadsheet solution		
MB1: 1–2 marks	**MB2: 3–4 marks**	**MB3: 5–7 marks**
Limited technical and/or usability testing undertaken	**Adequate** technical and usability testing undertaken with results partly documented	**Effective** technical and usability testing undertaken with results thoroughly documented
Unit R060 – Topic Area 4: Evaluating the spreadsheet solution		
MB1: 1–2 marks	**MB2: 3–4 marks**	**MB3: 5–7 marks**
Basic evaluation which states which parts of the solution meet the client requirements	**Adequate** evaluation which describes the effectiveness of the solution to meet the client requirements	**Comprehensive** evaluation which explains the effectiveness of the solution to meet the client requirements
Basic evaluation which states which parts of the Human Computer Interface worked well/did not work well	**Adequate** evaluation which describes the effectiveness of the Human Computer Interface to meet the client requirements	**Comprehensive** evaluation which explains the effectiveness of the Human Computer Interface to meet the client requirements

Assessment guidance

During the NEA, students will be expected to demonstrate their skills and understanding through 3 to 5 tasks in the set assignment. Students are required to plan and design, create, test and review the spreadsheet solution for the particular context. Students are expected to complete the assignment independently therefore it is highly unlikely that the same spreadsheet solution is created by all students. It is essential students have access to spreadsheet software to complete the assessment.

Teaching content	Assessment Guidance
1.1 and 1.2	• Students must be able to produce plans that clearly show the functionality to be included in the spreadsheet solution, the outputs that the spreadsheet solution will produce, and the interface for the user to effectively navigate around the spreadsheet solution. • The design plans should show how they meet the requirements as set out in the given scenario. • Students should annotate the visualisation and/or wireframes diagrams to show considerations which have been made throughout the planning and design phase. • The functionality of the solution can be shown as a written document or annotations on visualisation diagrams or wireframes, it can also be presented as a flow chart.
2.1	• Students must create a fully working spreadsheet solution which is fit for purpose and follows as close as possible their plans and design for the spreadsheet solution as this will be the evidence. • The students must use the data provided to help create the spreadsheet solution.
3.1	• Students must use the test plan provided to test their spreadsheet solution. • They will need to choose appropriate test data to match the description of the test. • They will only need to carry out the tests which have been identified in the test plan.
4.1	• Students must evaluate their spreadsheet solution by showing how their solution meets the client's requirements. They must also explain how their navigation and interface meets the HCI principles and conventions covered in section 1.1.3 of the specification.

Synoptic assessment

Some of the knowledge, understanding and skills required when completing this unit will draw on the learning developed in unit R050 IT in the Digital World. The following table details where these synoptic links can be found:

R060 – Data manipulation using spreadsheets		R050 - IT in the Digital World	
Topic Area		**Topic Area**	
1	Planning and designing the spreadsheet solution	1	Design tools
		2	Human Computer Interface (HCI) in everyday life
2	Creating the spreadsheet solution	3	Data and testing
		4	Cyber-security and legislation
3	Testing the spreadsheet solution	3	Data and testing

More information about synoptic assessment within this qualification can be found in section 5.2 Synoptic assessment.

4.4 Unit R070: Using Augmented Reality to present information

Aims

Augmented Reality (AR) has made it possible to present information so that users can see more detail in items/products with 2D or 3D images and can place the item digitally in their surroundings. AR provides increased engagement, interaction and a richer user experience. Businesses in different sectors such as IT, architecture, retail and hospitality, education and government are presenting information and/or products in a digital world using a range of digital devices. Augmented Reality software development kits (SDK) are used to create the AR product for different contexts.

In this unit you will learn the basics of Augmented Reality (AR) and the creation of a model prototype product to showcase how it can be used appropriately for a defined target audience to present information. You will also learn the purpose, use and types of AR in different contexts and how they are used on different digital devices. You will develop the skills to be able to design and create an AR model prototype, using a range of tools and techniques. You will also be able to test and review your AR model prototype.

Unit R070: Using Augmented Reality to present information

Topic Area 1: Augmented Reality (AR)

Teaching content	Exemplification
1.1 Purpose and uses of Augmented Reality (AR)	
□ What AR is □ The purpose of AR □ The sectors where AR can be used in ▪ Architecture ▪ Education ▪ Entertainment ▪ Retail ▪ Lifestyle □ Uses of AR ▪ Training ▪ Virtual tours ▪ Visualisation of designs, interiors, and concepts ▪ Marketing	To include: • Know the different sectors that use AR • Know how different sectors use AR Does not include: • The coding behind AR
1.2 Types of Augmented Reality (AR) and user interaction	
□ Types of AR ▪ Object recognition / Marker-based ▪ Location based / Markerless ▪ Superimposed □ User interaction / layers ▪ Static ▪ Interactive	To include: • Know the different types of AR • Know which sectors use each type of AR • How users can interact with AR • Know which sectors use the different types of user interaction
1.3 Devices used with Augmented Reality (AR)	
□ Types of devices AR can be used on ▪ Mobile devices ▪ Smart devices ▪ Laptop / PC	To include: • Know the different types of devices AR can be used on • Know which type of AR can be used on which type of device

Unit R070: Using Augmented Reality to present information

Topic Area 2: Designing an Augmented Reality (AR) model prototype

Teaching content	Exemplification
2.1 Planning and design considerations	
□ Purpose and user requirements □ Target audience □ Content □ Assets ▪ Audio ▪ Charts and graphs ▪ Hyperlink/Weblink ▪ Photograph(s) /Image(s) ▪ Text ▪ Video □ Triggers ▪ Object recognition / Marker-based ▪ Location (GPS) based / Markerless ▪ Superimposition □ Layers / User Interaction ▪ Action flow ▪ Static ▪ Interactive	To include: • Explain the purpose and user requirements of an AR product • Explain the target audience for an AR product • Identify the content and assets required to create an AR product • Identify the quality of the assets used to create an AR product • Explain the triggers and user interactions required for an AR product • Marker-based is a unique static image/trigger causing content to retrieve the content to superimposed on reality • Markerless scans environment, with no static image/ trigger to retrieve the content to superimpose on reality • Superimposition is a partial/entire replacement of object view with augmented object
2.2 Design Tools	
Tools used to design the content and action flow for an AR product □ Flowcharts □ Mind Maps □ Mood boards □ Storyboards □ Visualisation diagrams □ Wireframes	To include: • Use of appropriate design tools to support the creation of an AR product, including: ○ Content design ○ Action design ○ House style

Unit R070: Using Augmented Reality to present information

Topic Area 3: Creating an Augmented Reality (AR) model prototype

Teaching content	Exemplification
3.1 Augmented Reality (AR) model prototype	
□ Characteristics ▪ Not full product ▪ Confirms functionality ▪ Confirms aesthetics ▪ Has access to real data	To include: • Create model prototype to demonstrate the working functionality of the AR product • Create model prototype based on produced design documentation Does not include: • Full working final product
3.2 Triggers	
□ Trigger characteristics ▪ Must be unique ▪ Should not contain ○ blurred images ○ too much text ○ too much blank space ▪ Object recognition / Marker-based ▪ Location based / Markerless ▪ Superimposition	To include: • Triggers should contain as many graphical elements and shapes as possible, avoid using repeated graphic elements so that all markers look the same • Trigger type selection based on requirements of the context
3.3 Layers / user interaction	
□ Single and multiple layers □ Access to layers ▪ Static ▪ Interactive ○ Swipe ○ Click/select ○ Voice	To include: • Layers should be kept simple • Layer groups should be merged • Layers should have suitable names to indicate how they are organised • The layers themselves have to be set up and use the triggers
3.4 information output	
□ Audio □ Chart(s) and graph(s) □ Hyperlink(s)/Weblink(s) □ Photograph(s) /Image(s) □ Text □ Video(s)	To include: • The result of the user trigger interaction causing information output • How information can be output in different formats to meet the requirements of the context

Unit R070: Using Augmented Reality to present information

Topic Area 4: Testing and reviewing

Teaching content	Exemplification
4.1 Testing	
□ How to carry out testing of an AR model prototype ▪ Technical testing ▪ User testing □ Using a test plan ▪ Test number ▪ What is being tested ▪ Expected result ▪ Actual result ▪ Remedial action	To include: • Carrying out testing to ensure the AR model prototype works as intended • How to create a test plan • Carry out testing to ensure the AR model prototype can be used as intended • How to record test results and when to carry out remedial action
4.2 Reviewing the process of creating the Augmented Reality (AR) model prototype	
□ Ways to review ▪ The effectiveness of the processes followed ▪ The effectiveness of the tools and techniques used ▪ Does the AR model prototype meet the defined purpose ▪ Lessons learnt	To include: • The importance of using the design documentation • The effective use of AR tools and techniques to create an AR model prototype • Considering lessons learnt to improve approach when planning and creating an AR model prototype • Consideration of the defined purpose of the AR model prototype

Marking criteria

Section 6.4 provides full information on how to mark the NEA units and apply the marking criteria. The marking criteria command words are further explained in Appendix B *Command words*.

The tables below contain the marking criteria for the tasks for this unit. If a student's work does not meet Mark Band 1 (MB1) criteria for any task, you must award zero marks for that task.

Unit R070 – Topic Area 2: Designing an Augmented Reality (AR) model prototype		
MB1: 1–3 marks	**MB2: 4–6 marks**	**MB3: 7–10 marks**
Limited use of design tools and features used to plan the prototype, which are under-utilised for the creation of planning documentation	**Adequate** use of design tools and features used to plan the prototype, which are utilised for the creation of planning documentation	**Effective** use of design tools and features used to plan the prototype, which are fully utilised for the creation of planning documentation
MB1: 1–4 marks	**MB2: 5–8 marks**	**MB3: 9–13 marks**
Limited planning documentation analysing user requirements. Requirements are identified **Limited** design documentation for technical development	**Adequate** planning documentation analysing user requirements. Requirements are described **Adequate** design documentation for technical development	**Effective** planning documentation analysing and meeting user requirements. Requirements are explained **Effective** design documentation for technical development

Unit R070 – Topic Area 3: Creating an Augmented Reality (AR) model prototype		
MB1: 1–3 marks	**MB2: 4–6 marks**	**MB3: 7–10 marks**
Limited use of tools and features which are under-utilised for the creation of the prototype	**Adequate** use of tools and features which are utilised for the creation of the prototype	**Effective** use of tools and features which are fully utilised for the creation of the prototype
Basic user interaction which may use a single form	**Adequate** user interaction with more than one form used	**Effective** user interaction with more than one form used that leads into further layers of user interaction
MB1: 1–4 marks	**MB2: 5–8 marks**	**MB3: 9–13 marks**
The solution allows **limited** information to be presented to the intended audience(s) in a limited manner	The solution allows **adequate** information to be presented to the intended audience(s)	The solution allows **effective** information to be presented to the intended audience(s)
The solution will contain **inefficiencies** that affect the quality of the information presented	The solution will contain **inefficiencies**, but these do not affect the quality of the information presented	The solution is **effective** and efficient in presenting good quality and relevant information
The solution will provide a **limited** user experience	The solution provides an **adequate** user experience	The solution provides an **effective** user experience

Unit R070 – Topic Area 4: Testing and reviewing		
MB1: 1–2 marks	**MB2: 3–4 marks**	**MB3: 5–7 marks**
Testing is **limited** with minimal identification of tests used and results stated	Testing is **adequate** for most aspects with results documented. Any changes made due to test results are commented upon	Testing is **effective** for all aspects with results thoroughly and completely documented. Any changes made due to test results are explained
MB1: 1–2 marks	**MB2: 3–4 marks**	**MB3: 5–7 marks**
Basic review which states what worked well and/or what did not work well	**Adequate** review which describes the effectiveness of the processes followed during the designing and creation of the AR solution	**Comprehensive** review which explains the effectiveness of the processes followed during the designing and creation of the AR solution
	Adequate review which describes the effectiveness of the tools and techniques used during the designing and creation of the AR solution	**Comprehensive** review which explains the effectiveness of the tools and techniques used during the designing and creation of the AR solution. Describes lessons learnt

Assessment guidance

During the NEA, students will be expected to demonstrate their skills and understanding through 3 to 5 tasks in the set assignment. Students are required to plan and design, create, test and review their Augmented Reality (AR) model prototype solution for the particular context. Students must complete the assignment independently therefore it is highly unlikely that the same AR model prototype solution is created by all students . It is essential students have access to an AR software development kit (SDK) to complete the assessment, for more information see Appendix C.

Teaching content	Assessment Guidance
1.1, 1.2 and 1.3	• Students must know and understand the different uses of Augmented Reality (AR) in the different sectors, the different types of AR and the user interactions and the devices used for AR to support their explanations when designing the AR product for the assignment context. • While this aspect is not directly assessed, students know and understand this topic area in order to be able to complete the set assignment.
3.1, 3.2, 3.3 and 3.4	• Students must only create an AR model prototype meaning it is a simple model built and not a fully working AR product. Their AR model prototype will have limited functionality to showcase how the fully working AR solution for a given context and audience might look like. Think of it as a minimal viable product – just enough to demonstrate to your client or customer what the full version will look like and how it might function. • Students must use an AR software development kit to be able to use the tools and techniques as listed in Topic 3 above to create, test and review their AR model prototype, see appendix C for more information. They must not use PowerPoint presentation software to create an AR model prototype.

Synoptic assessment

Some of the knowledge, understanding and skills required when completing this unit will draw on the learning developed in unit R050 IT in the Digital World. The following table details where these synoptic links can be found:

R070: Using Augmented Reality to present information Topic Area		R050: IT in the Digital World Topic Area	
Topic Area		**Topic Area**	
2	Designing an Augmented Reality (AR) model Prototype	1	Design tools
		5	Digital communications
4	Testing and reviewing	3	Data and testing

More information about synoptic assessment within this qualification can be found in section 5.2 Synoptic assessment.

5 Assessment and grading

5.1 Overview of the assessment

Entry code	Qualification title	GLH	Reference
J836	**OCR Level 1/Level 2 Cambridge National in IT**	**120***	**603/7115/8**
Made up of three mandatory units: • Units R050, R060 and R070.			

*the GLH includes assessment time for each unit.

Individual unit details below:

Unit R050: IT in the digital world	
48 GLH 1 hour 30 minute written examination 70 marks (80 UMS) OCR-set and marked Calculators are not required in this exam	This question paper has two sections: • Section A – worth 15 marks. Includes closed response, multiple choice and short response questions. • Section B – worth 55 marks. Includes scenario based short, medium and extended response questions. One question will be a create style question [8 marks]. One extended response question [9 marks] will be assessed using a levels of response mark scheme.
Unit R060: Data manipulation using spreadsheets	
36 GLH OCR-set assignment 60 marks (60 UMS) Centre-assessed and OCR moderated	This set assignment contains three to five practical tasks. It should take approximately 10-12 GLH to complete.
Unit R070: Using Augmented Reality to present information	
36 GLH OCR-set assignment 60 marks (60 UMS) Centre-assessed and OCR moderated	This set assignment contains three to five practical tasks. It should take approximately 10-12 GLH to complete.

OCR-set assignments for units R060 and R070 will be available on our secure website, 'Teach Cambridge'.

5.2 Synoptic assessment

Synoptic assessment is a built-in feature of this qualification. It means that students need to use an appropriate selection of their knowledge, understanding and skills developed across the qualification in an integrated way and apply them to a key task or tasks.

This also helps students to build a holistic understanding of the subject and the connections between different elements of learning, so they can go on to apply what they learn from this qualification to new and different situations and contexts.

The externally assessed unit R050 allows students to gain underpinning knowledge and understanding relevant to IT and the non examined assessment (NEA) units R060 and R070 draw on and strengthen this learning by letting students apply their learning in a practical, skills-based way.

It is important to be aware of the synoptic links between the units so that teaching, learning and assessment can be planned accordingly. Then students can apply their learning in ways which show they are able to make connections across the qualification when they are assessed.

5.3 Transferable skills

This qualification also allows students the opportunity to gain broad, transferable skills and experiences that can be applied as they progress into their next stages of study and life and to enhance their preparation for future employment.

Students will develop the following skills that are transferable to different real-life contexts, roles or employment:

- planning a sequence of processes. This involves identifying hardware and software resources required for the solution, as well as reviewing plans, if necessary
- solving problems by identifying and rectifying any faults in the solution
- presenting ideas and concepts digitally, identifying and choosing the right tools, text, images, audio or video, etc
- analysing information and showing/demonstrating the ability to visualise, problem-solve, and make decisions
- thinking creatively to explore and generate ideas/solutions and outcomes that are of value. As part of this process and development:
    - connect ideas and experiences in inventive ways
    - question assumptions being made
    - try out alternatives or new solutions and follow ideas through
    - adapt ideas as circumstances change.

5.4 Grading and awarding grades

All results are awarded on the following scale:

- Distinction* at Level 2 (*2)
- Distinction at Level 2 (D2)
- Merit at Level 2 (M2)
- Pass at Level 2 (P2)
- Distinction at Level 1 (D1)
- Merit at Level 1 (M1)
- Pass at Level 1 (P1).

The shortened format of the grade will show on our secure website, 'Interchange' and some of our administrative documents. However, the full format of the grade will be on the certificates issued to students.

The boundaries for Distinction at Level 2, Pass at Level 2, and Pass at Level 1 are set judgementally. Other grade boundaries are set arithmetically.

The Merit (Level 2) is set at half the distance between the Pass (Level 2) grade and the Distinction (Level 2) grade. Where the gap does not divide equally, the Merit (Level 2) boundary is set at the lower mark (For example, 45.5 would be rounded down to 45).

For the examined unit, the Distinction* (Level 2) grade is normally set at about 0.75 of the D2-M2 distance above the D2 boundary mark.

To set the Distinction (Level 1) and Merit (Level 1) boundaries, the gap between the Pass (Level 1) grade and the Pass (Level 2) grade is divided by 3, and the boundaries set equidistantly. Where this division leaves a remainder of 1, this extra mark will be added to the Distinction (Level 1) to Pass (Level 2) interval, meaning the Distinction (Level 1) boundary will be lowered by 1 mark. Where this division leaves a remainder of 2, the extra marks will be added to the Distinction (Level 1) to Pass (Level 2) interval, and the Merit (Level 1) to Distinction (Level 1) interval, meaning the Distinction (Level 1) boundary will be lowered by 1 mark, and the Merit (Level 1) boundary will be lowered by 1 mark.

For example, if Pass (Level 2) is set judgementally at 59, and Pass (Level 1) is set judgementally at 30, then Distinction (Level 1) is set at 49, and Merit (Level 1) is set at 39.

Grades are indicated on qualification certificates. However, results for students who fail to achieve the minimum grade (Pass at Level 1) will be recorded as unclassified (U or u) and this is not certificated.

This qualification is unitised. Students can take units across different series and can resit units (see section 7.7 Unit and qualification resits). Grade boundaries are set per unit, per series, so may be set in different places for a unit in different series. When working out students' overall grades, OCR needs to be able to compare performance on the same unit in different series when different grade boundaries may have been set, and between different units. We use a Uniform Mark Scale (UMS) so this can be done.

A student's uniform mark for each unit is calculated from the student's raw mark on that unit. The raw mark boundary marks are converted to the equivalent uniform mark boundary. Marks between grade boundaries are converted on a pro rata basis.

When unit results are issued, the student's unit grade and uniform mark are given. The uniform mark is shown out of the maximum uniform mark for the unit (For example, 42/60).

The table below shows the Raw marks and UMS marks for each unit:

Marks	Exam	NEA1	NEA2
Raw marks	70	60	60
UMS	80	60	60

The uniform mark boundaries for each of the assessments are shown below:

Unit GLH	Max Unit Uniform Mark	Unit Grade							
		Distinction* at L2	Distinction at L2	Merit at L2	Pass at L2	Distinction at L1	Merit at L1	Pass at L1	U
36	60	54	48	42	36	30	24	18	**0**
48	80	72	64	56	48	40	32	24	**0**

The student's uniform mark for Unit R050 will be combined with the uniform mark for the NEA units to give a total uniform mark for the qualification. The student's overall grade will be determined by the total uniform mark. The following table shows the minimum total mark for each overall grade:

Max Uniform Mark	Qualification Grade							
	Distinction* at L2	Distinction at L2	Merit at L2	Pass at L2	Distinction at L1	Merit at L1	Pass at L1	U
200	180	160	140	120	100	80	60	**0**

A marks calculator is available on the qualification page of the OCR website to help you convert raw marks into uniform marks.

5.5 Performance descriptors

Performance descriptors give a general indication of likely levels of attainment by representative students performing at boundaries: Distinction at Level 2, Pass at Level 2 and Pass at Level 1.

Performance descriptor – Distinction at Level 2

Students will be able to:

- recall, select and apply **detailed** knowledge and **thorough** understanding of IT
- present information **clearly** and **accurately**, using a **wide range** of technical language and IT terminology
- apply **relevant** knowledge, understanding and skills in a **range** of situations to plan and create IT solution and product **effectively**, testing their solutions, and working safely
- analyse and evaluate the evidence available, reviewing and adapting their methods **where appropriate**
- make **reasoned** judgements and **substantiated** conclusions
- work confidently and independently to create solution and product which reflects **thoughtful** planning, **skilled** development and **perceptive** evaluation as well as **actively demonstrating** practical skills at a **high level**.

Performance descriptor – Pass at Level 2

Students will be able to:

- recall, select and apply **sound** knowledge and understanding of IT
- present information **clearly** and with **some accuracy**, using a **range of** technical language and IT terminology
- apply knowledge, understanding and skills in a **range** of situations to plan and create IT solution and product, testing their solutions, and working safely
- review evidence available, analysing and evaluating **some** information **clearly** and making **some basic** adaptations to their methods
- make **judgements** and draw **appropriate** conclusions
- work independently to create solution and product which reflects **effective** planning, development and evaluation and an ability to demonstrate **sound** practical skills.

Performance descriptor – Pass at Level 1

Students will be able to:

- recall, select and apply knowledge and understanding of **basic** aspects of IT
- present **basic** information, using **limited** IT terminology
- apply **limited** knowledge, understanding and skills to plan and create **simple** IT solution and product, with an awareness of the need for safety
- review evidence and draw **basic** conclusions
- create solution and product which demonstrates a degree of planning, development and evaluation and **limited** practical skills.

6 Non examined assessment (NEA) units (R060-R070)

This section provides guidance on the completion of the NEA units (R060 and R070).

The NEA units are designed so that students can build a portfolio of evidence to meet the topic areas for the unit.

Assessment for this qualification must adhere to JCQ's Instructions for Conducting Coursework. Please **do not** use JCQ's Instructions for Conducting Non-examination Assessments – these are only relevant to GCE and GCSE specifications.

Units R060 and R070 are centre assessed and externally moderated by us.

You **must** make sure that you have read and understood all of the rules and guidance provided in this section **before** your students complete and you assess the set-assignments.

If you have any queries please contact us for help and support.

6.1 Preparing for NEA unit delivery and assessment

6.1.1 Centre and teacher/assessor responsibilities

For the NEA units of this qualification we assume the teacher is the assessor.

Before you plan to get approval from us to offer this qualification you must be confident your centre can fulfil all the responsibilities described below.

The quality of the delivery of teaching and the integrity of assessments and quality assurance is paramount. Systems must be in place so that assessments are fair, valid, reliable and authentic. One of the key factors behind valid, fair and reliable assessment is the expertise of those doing the assessment and internal quality assurance.

With this in mind, here's a summary of the responsibilities that your centre and teachers must be able to fulfil. It is the responsibility of the head of centre[1] to make sure our requirements are met:

- there are enough trained or qualified people to teach and assess the expected number of students you have in your cohorts
- teaching staff have the relevant level of subject knowledge and skills to deliver and assess this qualification
- teaching staff will fully cover the knowledge, understanding and skills requirements in teaching and learning activities
- necessary resources are available for teaching staff and students during teaching and assessment activities, to give students every opportunity to meet the requirements of the qualification and reach the highest grade possible
- there's a system of standardisation in place so that all assessment decisions for teacher-marked (centre assessed) assignments are consistent, fair, valid and reliable (see internal standardisation in section 6.4.3)
- there's enough time for effective teaching and learning, assessment and internal standardisation
- processes are in place to make sure that students' work is individual and confirmed as being authentic (see Ways to authenticate work in section 6.2.1)
- you must use the OCR-set assignments for students' summative assessments
- the OCR-set assignments must not be used for practice (see section 6.2, Requirements and guidance for delivering and marking the OCR-set assignments)
- students understand what they need to do to get the highest marks possible
- students understand what it means when we say work must be authentic and individual and they (and you) must follow any requirements we set out to make sure their work is their own

1 This is the most senior officer in the organisation, directly responsible for the delivery of OCR qualifications. For example, the headteacher or principal of a school/college. The head of centre accepts full responsibility for the correct administration and conduct of OCR exams.

- students know they must not reference another individual's personal details in any evidence produced for summative assessment in accordance with the Data Protection Act 2018 and the UK General Data Protection Regulations (UK GDPR). It is the student's responsibility to make sure evidence that includes another individual's personal details is anonymised
- marks submitted to us are correctly recorded in all centre and OCR records and forms
- assessment of set assignments must adhere to JCQ Instructions for Conducting Coursework
- a declaration is made at the point you're submitting any work to us for assessment that confirms:
    - all assessment is conducted according to the specified regulations identified in the Administration area of our website
    - students' work is authentic
    - marks have been transcribed accurately
- centre records and students' work are kept according to the requirements below:
    - students' work must be kept until after their qualifications have been awarded and any review of results or appeals processed. We will not consider any review if the centre does not keep the work
    - internal standardisation and assessment records must be kept securely for a minimum of three years after the date we've issued a certificate for a qualification
- the head of centre must report all cases of suspected malpractice involving teachers or students (see 'Reporting suspected malpractice' in section 6.3.1).

6.2 Requirements and guidance for delivering and marking the OCR-set assignments

The assignments are set by us, taken under supervised conditions, marked by the teacher and moderated by us. Assignments will be available on our secure website, 'Teach Cambridge'.

The set assignments give an approximate time that it will take to complete all tasks. These timings are for guidance only, but should be used by you, the teacher, to give students an indication of how long to spend on each task. You can decide how the time should be allocated between each part or individual task. You are also permitted to spread the tasks across several sessions, and therefore it is permissible for evidence to be produced over several sessions.

We will replace the set assignments each year, published in June for teaching from the following September. You must check our secure website, 'Teach Cambridge' and use the set assignment that is live for assessment. The live assessment dates will be shown on the front cover.

Assessment of the set assignments must adhere to JCQ *Instructions for Conducting Coursework*.

Appendix A of this specification gives guidance for creating electronic evidence for the NEA units. Please read Appendix A along with the unit content and marking criteria grids as it might help you plan your delivery of the units.

The rest of this section deals with how we expect you to manage the delivery and marking of the set assignments, so that assessment is valid and reliable. Please note that failing to meet these requirements may be deemed to be malpractice.

Here is a summary of what we need you to do.

You **must**:

- have covered the knowledge, understanding and skills with your students and be sure they are ready for assessment before you start the summative assessment
- give students the Student Guidance document before they start the assessment
- make sure students are clear about the tasks they must complete and the criteria they are expected to meet. You can:
    - explain the task
    - provide a copy of the marking criteria to students
- allow students a reasonable amount of time to complete the assignments and be fair and consistent to all students. The time you allow should be in line with the estimated time we think it should take which is stated in the OCR-set assignments. Within that time students can work on

the tasks any time until the date the centre collects the work for centre assessment

- tell the students the resources and sources of assets that they can use in the assignment before undertaking the assessment tasks
- monitor students' progress to make sure work is capable of being assessed against the marking criteria, on track for being completed in good time and is the **student's own** work:
    - work must be carried out with enough supervision to make sure that the work submitted can be confidently authenticated as the student's own work
    - NEA work **must** be completed during normal curriculum time and supervised and marked by the teacher/assessor
    - if you provide any material to prepare students for the set assignment, you must adhere to the rules on using referencing and on acceptable levels of guidance to students set out within the Plagiarism and Feedback sections (see 6.2.2 Plagiarism and 6.3 Feedback)
    - students must produce their work independently (see 6.2.1 and 6.3 on Ways to authenticate work and Feedback)
    - you must make sure students are aware of the requirement to keep their work secure, not share with other students and keep their passwords secure
- allow students to take the initiative to improve any element of their work as they work through the assignment
- use the marking criteria to mark students' work
- before submitting marks to us, allow students to repeat any element of the assignment and rework their original evidence. But, any feedback given to students on the original (marked) evidence, must only be generic and must be recorded and available to the moderator (see section 6.3 on Feedback and section 6.4.4 on resubmitting work).

You **must not**:

- change any aspect of the OCR-set assignments (scenarios or tasks)
- accept multiple resubmissions of work where small changes have been made in response to feedback
- allow teachers or students to add, amend or remove any work after students have submitted work for final assessment. This will constitute malpractice
- practice the OCR-set assignment tasks with the students
- create practice assignments and practice data which are similar in nature to those set by us
- give detailed advice and suggestions to individuals or the whole class on how work may be improved to meet the marking criteria.

6.2.1 Ways to authenticate work

You must be confident that the work you mark is the student's own. Every student must produce their own work independently. You must use enough supervision, or complete sufficient checks, to be able to judge the authenticity of the student's work.

Wherever possible, the teacher should discuss work-in-progress with students. This will make sure that work is being completed in a planned and timely way and provide opportunities for you to check authenticity of the work.

You must:

- make sure students and other teachers understand what constitutes plagiarism and not accept plagiarised work as evidence (you might find the JCQ document *Plagiarism in Assessments* helpful)
- use supervision and questioning as appropriate to confirm authenticity
- make sure students and teachers fill in declaration statements.

6.2.2 Plagiarism

When producing final 'written' pieces of work for the set assignments, students must use their own words to show they have genuinely applied their knowledge and understanding. When students use their own words, ideas and opinions, it reduces the possibility of their work being identified as plagiarised. Plagiarism is the submission of someone else's work as your own and/or failure to acknowledge a source correctly. Plagiarism makes up a large percentage of cases of suspected malpractice reported to us by moderators. Teachers must make sure they do not accept plagiarised work as evidence.

Plagiarism often occurs innocently when students do not know that they must reference or acknowledge their sources or aren't sure how to do so. It's important to make sure your students understand:

- the meaning of plagiarism and what penalties may be applied
- that they can refer to research, quotations or evidence produced by somebody else but they must list and reference their sources and clearly mark quotations
- quoting someone else's work, even when it's properly sourced and referenced, doesn't evidence understanding. The student must 'do' something with that information to show they understand it. For example, if a student has to analyse data from an experiment, quoting data doesn't show that they understand what it means. The student must interpret the data and, by relating it to their assignment, say what they think it means. The work must clearly show how the student is using the material they have referenced **to inform their** thoughts, ideas or conclusions.

We have a guide to referencing on our website *The OCR Guide to Referencing* and we have also produced a poster on referencing and plagiarism which may be useful to share with students.

Some useful tips are:

- Best practice is to always reference material copied from the internet or other sources. This applies to infographics (graphical information providing data or knowledge) as well
- Teach your students how to reference and explain why it's important to do it. At Key Stage 4 it is sufficient if they:
  - use quote marks to show the beginning and end of the copied work
  - for website text, list the html address and ideally the date they accessed the website
  - for other publications, list the name of the resource/book/printed article and ideally the year in which it was published.
- Students must also identify information they have copied from teaching handouts and presentations for the unit, using quote marks and stating the text is from class handouts.

Identifying copied/plagiarised work

Inconsistencies throughout a student's response are often indicators of plagiarism. For example:

- different tones of voice, sentence structure and formality across pieces of work
- use of American expressions, spellings and contexts (such as American laws and guidelines)
- dated expressions and references to past events as being current
- sections of text in a document where the font or format is inconsistent with other sections.

What to do if you think a student has plagiarised

If you identify plagiarised work at the point of marking or moderation:

- this must be taken into account when applying the mark scheme
  - the work should be included with any work that is sent to the moderator if it is part of the moderation sample, with a note on the Unit Recording Sheet to state that there is plagiarism in the work and that marks have been adjusted accordingly
- the student(s) must be reported for plagiarism in line with the JCQ document Suspected Malpractice Policies and Procedures
  - Fill in the *JCQ form M1*
  - In line with the policy and procedures of JCQ on suspected malpractice, the penalties applied for plagiarism would usually result in the work not being allowed or the mark being significantly reduced.

6.3 Feedback

Feedback to students on work in progress towards summative assessment

You can discuss work-in-progress towards summative assessment with students to make sure it's being done in a planned and timely way. It also provides an opportunity to check the authenticity of the work. You must intervene if there's a health and safety risk.

Generic guidance to the whole class is also allowed. This could include reminding students to check they have provided evidence to cover every aspect of the task. Individual students can be prompted to double check for gaps in evidence providing that specific gaps are not pointed out to them.

You can give general feedback and support if one or more students are struggling to get started on an aspect of the assignment or following a break between sessions working on the assignment. For example, if a student is seeking more guidance that suggests they are not able to apply knowledge, skills and understanding to complete their evidence you can remind them that they had a lesson which covered the relevant topic. The student would need to review their own notes to find this information and apply it as needed.

Feedback must not provide specific advice and guidance that would be construed as coaching. This would compromise the student's ability to independently perform the task(s) they are doing and constitutes malpractice. Our moderators use a number of measures to assure themselves the work is the student's own.

Once work has been marked, feedback must be provided to students on the work they submitted for assessment.

Feedback **must**:

- be supportive, encouraging and positive
- tell the student what has been noticed, not what the teacher thinks (for example if you have observed the student completing a task you can describe what happened, what was produced and what was demonstrated)

Feedback **can**:

- identify what task and part of the task could be improved, but not detail how to improve it. You could show the student work from a **different** unit that demonstrates higher achievement, but you must not detail to the student how they could achieve that in their work. If you are using another student's work as a model answer, please anonymise this work. You could remind students that they had a lesson on a specific topic and that they could review their notes, but you must not tell them how they could apply the teaching to improve their work.
- comment on what has been achieved, for example *'the evidence shows a sound understanding for MB2'*
- identify that the student hasn't met a command verb or mark band requirement. For example, *'This is only a description, not an evaluation'.*
- identify what area of work could be improved but not detail how to improve it. For example, students can be reminded that they had a lesson on a specific topic and could review their notes, but can not be told how to apply the teaching to improve the work.
- use text from the specification, assignment or marking criteria in general guidance to clarify what is needed in the work. For example '*You have **effectively** used the tools and features, which are fully utilised for the creation of the prototype however, it only provides an **adequate** user interaction.'*
- point out where the work sits within the mark bands but students must make their own decisions as to what to improve and how. For example, the feedback can say '*this shows a **sound** understanding*' (for mark band 2) but not precisely what should be added to make it show a **comprehensive** understanding (for mark band 3).

Feedback **must not**:

- point out specific gaps for example you must not prompt the student to include specific detail in their work, such as *'You need to improve this by giving more detail'*
- be so detailed that it
  - leads students to the answer for example you must not give model answers on the **same** unit being taken or explain specifically what amendments should be made. If work from another student on **a different unit** is being used to model answers, please ensure it is anonymised.
  - provides a step-by-step guide on what to do to complete or improve work, for example you must not give headings or templates that include examples which give all or part of what students have to write about or produce.
- talk the student through how to achieve or complete the task
- give detail on where to find information/evidence.

In other words, feedback must help the student to take the initiative in making changes. It must not direct or tell the student what to do to complete or improve their work in a way that means they do not need to think how to apply their learning. Students need to recall or apply their learning. You must not do the work for the student(s).

Neither you nor the student can add, amend or remove any work after the final mark has been submitted for moderation.

Please see additional guidance for students who wish to resubmit their work in Section 6.4.4.

What over-direction might look like

When we see anything that suggests the teacher has led students to the answer, we become concerned because it suggests students have not worked independently to produce their assignment work. The following are examples of what may indicate over-direction by the teacher:

- prompts that instruct students to include specific detail in their work, such as, 'Your design does not include details of'
- headings or templates that include examples which give all or part of what students have to write about or produce, such as 'improvements to your solution or product could be'.

Moderators will report suspected malpractice when they cannot see differences in content between students' work in the sample they are moderating. An exception is when students have only used and referenced technical facts and definitions. If the moderator is in any doubt, they will report suspected malpractice. The decision on whether or not to investigate is made by us not the moderator.

6.3.1 Reporting suspected malpractice

It is the responsibility of the head of centre to report all cases of suspected malpractice involving teachers or students.

A JCQ Report of Suspected Malpractice form (JCQ/M1 for student suspected malpractice or JCQ/M2 for staff suspected malpractice) is available to download from the JCQ website and must be completed as soon as possible and emailed to us at malpractice@ocr.org.uk.

When we ask centres to investigate instances of malpractice, heads of centres must act promptly and report the outcomes to us.

More information about reporting and investigating suspected malpractice, and the possible sanctions and penalties which could be imposed, is in the JCQ publication: Suspected Malpractice Policies and Procedures. You can also find out more on our website.

6.3.2 Supervision

NEA work must be completed in normal curriculum time and supervised and marked by the teacher. You must use enough checks so you're confident the student's work is authentic.

For example, you can use questioning to confirm the depth and breadth of their understanding of the topic they've covered in a specific piece of work.

6.3.3 Student and centre declarations

Both students and teachers must declare that the work is the student's own:

- **each student** must sign a declaration before submitting their work to their teacher. A candidate authentication statement that can be used is available to download from the OCR website. These statements should be kept within the centre until all enquiries about results, malpractice and appeal issues have been resolved. **A mark of zero must be recorded if a student cannot confirm the authenticity of their work**.
- **teachers** must declare the work submitted for centre assessment is the student's own work by completing a centre authentication form (CCS160) for each unit. Centre authentication forms should be kept within the centre until all post-results issues have been resolved.

6.3.4 Group working

We do not assess the skills associated with group work in this qualification and the OCR-set assignment will not include it. If it is necessary to use group work to make the delivery of the assignment more manageable, you must make sure that all practical tasks and evidence submitted for assessment that shows the student has met the marking criteria is entirely the individual's own work.

6.3.5 Methods of assessment

It is your responsibility to choose the best method of assessing a student in relation to their individual circumstances. The methods chosen must be:

- valid
- reliable
- safe and manageable
- suitable to the needs of the student.

Valid

Validity can be compromised if a student does not understand what is being asked of them. For example, one valid method of assessing a student's knowledge and understanding is to question them. If the questions posed are difficult for the student to understand (not in terms of the content but the way they are phrased, for example) the validity of the assessment method is questionable.

As well as assessment methods being valid, the evidence presented must also be valid. For example, it would not be appropriate to present an organisation's equal opportunities policy as evidence towards a student's understanding of how the equal opportunities policy operates within the organisation. It would be more appropriate for the student to incorporate the policy within a report describing different approaches to equal opportunities.

Reliable

A reliable method of assessment will produce consistent results for different assessors on each assessment occasion. Internal moderators must make sure that all assessors' decisions are consistent.

Safe and manageable

Assessors and internal moderators must make sure that the assessment methods are safe and manageable and do not put unnecessary demands on the student.

Suitable to the needs of the student

We are committed to ensuring that achievement of these qualifications is free from unnecessary barriers. You must follow this commitment through when considering assessment.

6.3.6 Presentation of the final piece of work

Students must observe the following procedures when producing their final piece of work for the NEA tasks:

- Work can be produced using appropriate software and/or handwritten
- tables and graphs (if relevant) may be produced using appropriate software application
- any copied material must be suitably acknowledged
- quotations must be clearly marked and a reference provided
- a completed Unit Recording Sheet must be attached to work submitted for moderation. The Unit Recording Sheet can be downloaded from the qualification page
- centres **must** provide guidance on the Unit Recording Sheet (URS) to show where specific evidence can be found. This may be through the use of the 'page number' column and/or by referencing file names and locations
- work submitted digitally for moderation should be on electronic media (for example, on our portal, CD or USB Drive), and be in a suitable file format and structure, as detailed in Appendix A at the end of this specification. Students must submit their completed product(s) in an electronic format that is suitable for the client in the set assignment.

6.4 Marking NEA units

All NEA units are internally marked by teachers using the OCR marking criteria and guidance and externally moderated by the OCR-appointed moderator. Assessment of the set assignments must adhere to JCQ *Instructions for Conducting Coursework.*

The centre is responsible for appointing someone to act as the assessor. This could be the teacher who has delivered the programme or another person from the centre.

The marking criteria must be used to mark the student's work. These specify the levels of skills, knowledge and understanding that the student is required to demonstrate.

6.4.1 Use of a 'best fit' approach to marking criteria

The assessment tasks should be marked by teachers/assessors according to the OCR marking criteria using a 'best fit' approach. For each of the marking criteria, teachers/assessors select the band descriptor provided in the marking grid that most closely describes the quality of the work being marked.

Marking should be positive, rewarding achievement rather than penalising failure or omissions. The award of marks **must be** directly related to the marking criteria.

- Each band descriptor covers all the relevant content for the topic areas
- The descriptors should be read and applied as a whole
- Make a best fit match between the answer and the band descriptors
- An answer does not have to meet all of the requirements of a band descriptor before being placed in that band. It will be placed in a particular band when it meets more of the requirements of that band than it meets the requirements of other bands.
- Where there is more than one strand within the band descriptors for a topic area and a strand has not been addressed at all, it is still possible for the answer to be credited within that mark band depending upon the evidence provided for the remaining strands. The answer should be placed in the mark band most closely reflecting the standard achieved across all strands within the band descriptors for topic areas; however in this scenario, the mark awarded for that band should reflect that a strand has not been addressed.

When deciding the mark within a band, the criteria below should be applied:

- the extent to which the statements within the band have been achieved. For example:
    - an answer that convincingly meets nearly all of the requirements of a band descriptor should

be placed at or near the top of that band. Where the student's work convincingly meets the statements, the highest mark should be awarded.

- an answer that meets many of the requirements of the band descriptor should be placed in the middle of the band. Where the student's work adequately meets the statements, the most appropriate mark in the middle range should be awarded.
- if an answer is on the borderline between two bands but it is decided that it better fits the descriptors for:
  - the lower of these two bands - it should be placed near the top of the lower band
  - the higher of these two bands - the lowest mark for the higher band should be awarded.

- if a student's work does not meet Mark Band 1 (MB1) criteria for any task, you must award zero marks for that task.

Teachers/assessors should use the full range of marks available to them and award full marks in any band for work that fully meets that descriptor. This is work that is 'the best one could expect from students working at that level'.

6.4.2 Annotating students work

Each piece of NEA work should show how the marks have been awarded in relation to the marking criteria.

Writing comments on students' work and Unit Recording Sheet (URS) provides a means of communication between teachers during the internal standardisation, and with the moderator if the work is part of the moderation sample.

6.4.3 Internal standardisation

It is important that all teachers/assessors work to common standards. Centres must make sure that, within each unit, the internal standardisation of marks across teachers/assessors and teaching groups takes place using an appropriate procedure.

This can be done in a number of ways. In the first year, reference material and OCR training meetings will provide a basis for centres' own standardisation. In following years, this, or centres' own archive material, may be used. We advise centres to hold preliminary meetings of staff involved to compare standards through cross-marking a small sample of work. After most marking has been completed, a further meeting at which work is exchanged and discussed will help final adjustments to be made.

If you're the only assessor in your centre for this qualification, then it's still advisable to make sure your assessment decisions are internally standardised by someone else in your centre, ideally someone who has experience of the nature of this qualification (For example, is delivering a similar qualification in another subject) or relevant subject knowledge and asking them to review a sample of the assessments.

You must keep evidence of internal standardisation in the centre for the moderator to see.

We have a guide to how internal standardisation may be approached on our website.

6.4.4 Resubmitting moderated work for (summative) assessment to improve the grade

If following moderation you and the student feel they have not performed at their best during the assessment, the student can, at the centre's discretion, improve their work and resubmit it to you for assessment. You must be sure it is in the student's interests to re-attempt the assessment.

Resubmission of the **same** work must be in a series that falls in the live assessment dates for the assignment on which the work is based. The live assessment date will be shown on the front cover of the assignment. If you want to resubmit NEA work for a student **after** the live assessment date for the original assignment, the work must be based on the assignment that is live for the series in which you are submitting the work for assessment. We will not accept work for moderation (or re-moderation) based on an assignment that is no longer live.

You must record the reasons why a student has been allowed to resubmit in the centre's assessment decision records. You must also follow our guidelines on giving feedback and record the feedback given to the student on the original work. We monitor the assessment decisions you make. You must follow the same guidelines as outlined in Section 6 where a student improves their work for resubmission. All feedback that has been given to the student for the purposes of resubmitting work must be recorded. We reserve the right to request the written feedback and the work in its original state. If you do not meet the requirements this will be treated as malpractice.

There is one resubmission opportunity. Resubmission before submitting a final mark to us is intended to allow the student to reflect on feedback (which must be recorded) and improve their work. It is not an iterative process where they make small modifications through ongoing feedback to eventually achieve the desired level.

Neither you nor the student can add, amend or remove any work after the final mark has been submitted for moderation.

See Section 7.2 for terminal assessment rules.

6.4.5 Submitting marks

All work for NEA units is marked by the teacher and internally standardised by the centre. Marks are then submitted to us. You can find the key dates and timetables on our website.

There should be clear evidence that work has been attempted and some work produced. If a student submits no work for a NEA unit, the student should be identified as being absent from that unit.

If a student completes any work at all for a NEA unit, then the work should be assessed according to the marking criteria and the appropriate mark awarded. This may be zero.

6.5 Moderating NEA units

The purpose of external moderation is to make sure that the standard of marking is the same for each centre and that internal standardisation has taken place.

The administration pages of our website provide full details about how to submit work for moderation.

This includes the deadline dates for entries and submission of marks. For moderation to happen, centres must submit their marks.

6.5.1 Sample requests

Once you have submitted your marks, we will tell you which work will be sampled as part of the moderation. Samples will include work from across the range of attainment of students' work. Copies of students' work must be kept until after their qualifications have been awarded and any review of results or appeals processed.

Centres will receive the final outcomes of moderation when the provisional results are issued. Results reports will be available for you to access. More information about the reports that are available is on our administration pages.

As it is essential for us to have sample work available at awarding meetings, we may ask some centres to release work for awarding and archive purposes. We will let you know as early as possible if we need this from you and always appreciate your co-operation.

7 Administration

The information in this section gives an overview of the processes involved in administering this qualification. All of the following processes require you to submit something to OCR by a specific deadline. More information about the processes and deadlines involved at each stage of the assessment cycle can be found in the Administration area of the OCR website.

7.1 Assessment availability

There are two assessment series available each year in January and June to all students. Students can be entered for different units in different assessment series.

All students must take the exam at a set time on the same day in a series. Certification is available each January and June.

Series	Unit availability	
	Unit R050	Units R060-R070
January	✓	✓
June	✓	✓

7.2 Terminal Assessment

The externally assessed unit must be taken as terminal assessment. This means that the exam for unit R050 must be taken at the end of the students' course of study. This exam contributes 40% of the total marks available for the qualification.

NEA units can be submitted in any series but must be submitted either before or in the same series as the externally assessed unit.

Certification entries

- For a student to achieve the qualification, you need to make a qualification certification entry (aggregation)
- You can make certification entries:
  - at the same time as unit entries for the exam
  - after you have received results for the exam as a late certification request for that series
  - after you have received results for the exam as a certification entry in a later series
- You can make certification entries in the January or June series – this is the series that will appear on the qualification certificate
- Certification entries and late certification requests are free of charge

Resitting units before certification

- Students **can** take the exam before all the NEA units are completed. This is classed as a 'practice attempt'.
- 'Practice attempts' do not count towards the student's overall grade or in performance tables. The student will be issued with a unit result only.
- When the student has completed all the NEA units, if you do not make a certification entry when you enter for the exam, the exam will be classed as a practice attempt unless you make a late certification entry or a certification entry in a subsequent series
- If a student takes the exam again after a practice attempt, the result of the latest attempt will count towards the qualification result, even if the practice attempt result was higher
- An NEA unit can be resubmitted once before the overall qualification is awarded. We will use the best result of all attempts towards the qualification result.

Retaking the qualification

- After a student has achieved a qualification result, they can resit the externally assessed unit and submit the NEA units again in a later series to improve their qualification result:
  - students can retake the exam without resubmitting the NEA units
  - students cannot resubmit the NEA units only to improve results. In order to meet terminal assessment requirements, they must also retake the exam if they are resubmitting NEA units.
- As we will replace the set assignments annually, you must check our secure website, 'Teach Cambridge' to make sure any intended resubmissions align with the set assignments that are available to be used in that period
- The result from the first overall qualification result is used towards the performance tables.

7.3 Equality Act information relating to Cambridge Nationals

The Cambridge Nationals require assessment of a broad range of skills and, as such, prepare students for further study and higher-level courses.

The Cambridge Nationals qualifications were reviewed to check if any of the competences required presented a potential barrier to disabled students. If this was the case, the situation was reviewed again to make sure that such competences were included only where essential to the subject.

7.4 Accessibility

There can be adjustments to standard assessment arrangements on the basis of the individual needs of students. It's important that you identify as early as possible whether students have disabilities or particular difficulties that will put them at a disadvantage in the assessment situation and choose a qualification or adjustment that allows them to demonstrate attainment.

If a student requires access arrangements in assessments that need approval from us, this must be gained in Access Arrangements Online. You must select the appropriate qualification type(s) at time of application. Approval from GCSE or GCE applications alone no longer extends to other qualification types, but more than one qualification type can be selected when making an application. For guidance or support please contact the OCR Special Requirements Team.

The responsibility for providing adjustments to assessment is shared between your centre and us. Please read the JCQ booklet Access Arrangements and Reasonable Adjustments at www.jcq.org.uk.

If you have students who need a post-examination adjustment to reflect temporary illness, indisposition or injury when they took the assessment, please read the JCQ document A guide to the special consideration process, available at www.jcq.org.uk.

If you think any aspect of this qualification unfairly restricts access and progression, please email or call our Customer Support Centre.

The access arrangements permissible for use in this specification are as follows:

Access arrangement	Yes/No	Type of assessment
Reader/Computer reader	Yes	All assessments
Scribes/Speech recognition technology	Yes	All assessments
Practical assistants	Yes	All assessments
Word processors	Yes	All assessments
Communication professional	Yes	All assessments
Language modifier	Yes	All assessments
Modified question paper	Yes	Timetabled examinations
Extra time	Yes	All assessments with time limits

7.5 Requirements for making an entry

We provide information on key dates, timetables and how to submit marks on our website.

Centres must be registered with OCR in order to make any entries. We recommend that centres apply to become a registered centre with us, well in advance of making their first entries. Details on how to register with OCR can be found on our website.

It is essential that unit entry codes are quoted in all correspondence with OCR.

7.5.1 Making estimated unit entries

Estimated entries are not required for Cambridge National in IT.

7.5.2 Making final unit entries

When making an entry, centres must quote unit entry codes and component codes. Students submitting work must be entered for the appropriate unit entry code from the table below.

The short title for these Cambridge National qualifications is CAMNAT and will display as such on our secure website, 'Interchange' and some of our administrative documents.

You do not need to register your students first. Individual unit entries should be made for the series in which you intend to submit an NEA unit or sit the externally assessed examination.

Only make a certification entry using the overall qualification code (see section 7.6) in the final series.

Unit entry code	Component code	Assessment method	Unit titles
R050	01	Written paper	IT in the digital world
R060 A	01	Moderated	Data manipulation using spreadsheets
R070 A	01	Moderated	Using Augmented Reality to present information

7.6 Certification rules

Students must be entered for qualification certification separately from unit assessment(s). If a certification entry is **not** made, no overall grade can be awarded.

Students may be entered for:

- OCR Level 1/Level 2 Cambridge National in IT - certification code J836

7.7 Unit and qualification resits

Students may resit each unit and the best unit result from the NEA units will be used to calculate the certification result.

Students may resit the externally assessed unit R050**. Please see section 7.2 for information relating to our terminal assessment approach.**

You must make sure that when arranging resit opportunities they are fair to all students and do not give students an unfair advantage over other students. For example, the student must not have direct guidance and support from the teacher in producing further evidence for NEA units.

When resitting a NEA unit, students must submit new, amended or enhanced work, as detailed in the *JCQ Instructions for conducting coursework*.

Centres must make sure that when arranging resit opportunities they do not adversely affect other assessments being taken.

Arranging a resit opportunity is at the centre's discretion. Summative assessment series must not be used as a diagnostic tool and resits should only be planned if it is clear that the student has taken full advantage of the first assessment opportunity and formative assessment process.

7.8 Post-results services

A number of post-results services are available:

- Enquiries about results – If you think there might be something wrong with a student's results, you may submit an enquiry about results
- Missing and incomplete results – This service should be used if an individual subject result for a student is missing, or the student has been omitted entirely from the results supplied
- Access to scripts – you can ask for access to marked scripts.

Please refer to the JCQ Post-Results Services booklet and the OCR Administration page for further guidance about action on the release of results.

For internally assessed units the review of results process cannot be carried out for one individual student; the outcome of a review of moderation must apply to a centre's entire cohort.

Appendix A: Guidance for the production of electronic evidence

Structure for evidence

The centre-assessed (NEA) units in this qualification are units R060-R070. For each student, all the tasks together will form a portfolio of evidence, stored electronically. Evidence for each unit must be stored separately.

An internal assessment portfolio is a collection of folders and files containing the student's evidence. Folders should be organised in a structured way so that the evidence can be accessed easily by a teacher or moderator. This structure is commonly known as a folder tree. It would be helpful if the location of particular evidence is made clear by naming each file and folder appropriately and by use of an index called 'Home Page'.

There should be a top-level folder detailing the student's centre number, OCR candidate number, surname and forename, together with the unit code (R060 and R070), so that the portfolio is clearly identified as the work of one student.

Each student's internal assessment portfolio should be stored in a secure area on the centre's network. Before submitting the portfolio to OCR, the centre should add a folder to the folder tree containing the internal assessment and summary forms.

Data formats for evidence

In order to minimise software and hardware compatibility issues it will be necessary to save students' work using an appropriate file format.

Students must use formats appropriate to the evidence that they are providing and appropriate to viewing for assessment and moderation. Open file formats or proprietary formats for which a downloadable reader or player is available are acceptable. **Where this is not available, the file format is not acceptable.**

Evidence submitted is likely to be in the form of word processed documents, presentation documents, digital photos and digital video.

To make sure files are compatible, all files submitted electronically must be in the formats listed below. Where new formats become available that might be acceptable, we will provide further guidance. We advise against changing the file format that the document was originally created in. Files should be exported in a generic format that can be opened on a PC computer system without any specialist software applications. It is the centre's responsibility to make sure that the electronic portfolios submitted for moderation are accessible to the moderator and fully represent the evidence available for each student.

Standard file formats acceptable as evidence for the Cambridge Nationals are listed here.

File type	File format	Max file size*
Audio	.3g2 .3ga .aac .aiff .amr .m4a .m4b .m4p .mp3 .wav	25GB
Compression	.zip .zipx .rar .tar .tar .gz .tgz .7z .zipx .zz	25GB
Data	.xls .xlsx .mdb .accdb .xlsb	25GB
Document	.odt .pdf .rtf .txt .doc .docx .dotx .pages	25GB
Image	.jpg .png .jpeg .tif .jfif .gif .psd .dox .pcx .bmp .wmf	15MB
Presentation	.ppt .pptx .pdf .gslides .pptm .odp .ink .potx .pub	25GB
Video	.3g2 .3gp .avi .flv .m4v .mkv .mov .mp4 .mp4v .wmp .wmv	25GB
Web	.wlmp .mts .mov-1 .mp4-1 .xspf .mod .mpg	25GB

*max file size is only applicable if using eSubmission system.

eSubmission is our browser-based file repository, to upload students' work. You can run eSubmission on any laptop or desktop computer running Windows or macOS. It supports the upload of files in the formats listed in the table above as long as they do not exceed the maximum file size. Other file formats and folder structures can be uploaded within a compressed file format.

When you view some types of files in eSubmission, they will be streamed in your browser. It would help your moderator or examiner if you could upload files in the format shown in the table below:

File type	File format	Chrome	Firefox
Audio	.mp3	Yes	Yes
Audio	.m4a	Yes	Yes
Audio	.aac	No	Yes
Document	.txt	Yes	Yes
Image	.png	Yes	Yes
Image	.jpg	Yes	Yes
Image	.jpeg	Yes	Yes
Image	.gif	Yes	Yes
Presentation	.pdf	Yes	Yes
Video	.mp4	Yes	Yes
Video	.mov	No	Yes
Video	.3gp	Yes	No
Video	.m4v	Yes	Yes
Web	.html	Yes	Yes
Web	.htm	Yes	Yes

Appendix B: Command words

External assessment

The table below shows the command words that will be used in exam questions. They show what we mean by the command word and how students should approach the question and understand its demand. Remember that the rest of the wording in the question is also important.

Word(s)	Students will....
Analyse	• Separate or break down information into parts and identify their characteristics or elements • Explain the pros and cons of a topic or argument and make reasoned comments • Explain the impacts of actions using a logical chain of reasoning
Annotate	• Add information, for example, to a table, diagram or graph until it is final • Add all the needed or appropriate parts
Calculate	• Get a numerical answer showing how it has been worked out
Choose	• Select an answer from options given
Circle	• Select an answer from options given
Compare and contrast	• Give an account of the similarities and differences between two or more items or situations
Complete	• Add all the needed or appropriate parts • Add information, for example, to a table, diagram or graph until it is final
Create	• Produce a visual solution to a problem (for example: a mind map, flowchart or visualisation)
Describe	• Give an account including all the relevant characteristics, qualities or events • Give a detailed account of
Discuss	• Present, analyse and evaluate relevant points (for example, for/against an argument)
Draw	• Produce a picture or diagram
Evaluate	• Make a reasoned qualitative judgement considering different factors and using available knowledge/experience
Explain	• Give reasons for and/or causes of • Use the words or phrases such as 'because' or 'therefore' or 'this means that' in answers
Fill in	• Add all the needed or appropriate parts • Add information, for example, to a table, diagram or graph until it is final
Identify	• Select an answer from options given • Recognise, name or provide factors or features
Justify	• Give good reasons for offering an opinion or reaching a conclusion
Label	• Add information, for example, to a table, diagram or graph until it is final • Add all the necessary or appropriate parts
Outline	• Give a short account, summary or description
State	• Give factors or features • Give short, factual answers

Non examined assessment (NEA)

The tables below show the command words that will be used in the NEA Marking Criteria grids. They explain the type of evidence that you should expect to see to meet each command word.

Mark Band (MB1) Words:

Command word	Meaning
Basic	• Work includes the minimum required. It is a starting point but is simplistic and not developed. • Understanding and skills are applied in a way that partly achieves the wanted or intended result, but it would not be useable without further input or work
Brief/Briefly	• Work includes a small number of relevant facts or concepts but lacks detail, contextualisation or examples
Dependent	• The student can perform a task when given regular assistance or help
Few	• Work produced is restricted or narrow. It includes less than half of the information or examples expected for a full response.
Inefficient	• Outputs are produced but with great expense or effort because of poor organisation or design and not making the best use of available resources
Limited	• Work produced is restricted in range or scope and includes only some of the information required. It evidences partial rather than full understanding. • Work produced is a starting point rather than a developed process, concept or output
Minimal	• Includes very little in amount or quantity required
Simple	• Includes a small number of relevant parts, which are not related to each other
Superficial	• Work completed lacks depth and detail

Mark Band (MB2) Words:

Command word	Meaning
Adequate(ly)	• Work includes the appropriate number of relevant facts or concepts but does not include the full detail, contextualisation or examples
Assisted	• The student can perform a task with occasional assistance or help
Part(ly)/Partial	• To some extent but not completely • Work produced is inclusive in range and scope. It evidences a mainly developed application of understanding, performance or output needed. • Work produced results in a process, concept or output that would be useable for its purpose
Some	• Work produced is inclusive but not fully comprehensive. It includes over half the information or examples expected for a full response.
Sound	• Valid, logical, shows the student has secured most of the relevant understanding, but points or performance are not fully developed • Applies understanding and skills to produce the wanted or intended result in a way that would be useable

Mark Band (MB3) Words:

Command word	Meaning
Accurate(ly)	• Acting or performing with care and precision • Correct in all details
All	• Work produced is fully comprehensive and wide-ranging. It includes almost all, or all the information or examples expected for a full response.
Clear(ly)	• Focused and accurately expressed, without ambiguity
Complex	• Includes many relevant parts, all of which relate to each other logically
Comprehensive(ly)	• The work produced is complete and includes everything required to show depth and breadth of understanding • Applies the understanding and skills needed to successfully produce the wanted or intended result in a way that would be fully fit-for-purpose
Consistent(ly)	• A level of performance which does not vary in quality over time
Critical	• Objective analysis and evaluation in order to form: a judgement, evaluation of the evidence or effective trouble shooting/fault finding
Detailed	• Gives point by point consideration of all the key information
Effective	• Applies the skills required to the task and is successful in producing the desired or intended result • The work produced is effective in relation to a brief
Efficient	• Able to produce results or outputs with the minimum expense or effort, because of good organisation or design and making the best use of available resources
Full(y)	• Work produced is comprehensive in range and scope. It evidences a fully developed application of understanding, performance or output needed. • Work produced results in a process, concept or output that would be fully fit-for-purpose
Independent(ly)	• The student can perform a task without assistance or reliance on others
Justify/Justified	• The reasons for doing something are explained in full
Most(ly)	• Includes nearly all of what is expected to be included
Wide (ranging)	• Includes many relevant details, examples or contexts; all of which are fully detailed, contextualised or exemplified

Appendix C: Augmented Reality (AR) Software Development Kits (SDKs) – a starting point

Augmented Reality (AR) software development kits (SDKs) are used to create the AR products for real-life contexts. In the R070 set assignment task students must use SDKs to create their AR model prototype.

We have identified some SDKs that may be suitable for school use and are free to download for educational purposes. All SDKs listed below would allow a student to meet the requirements at Mark band 3.

For some AR SDKs you need to use Unity or Unreal Engine as a platform. There are free versions of Unity Game Engine and Unreal Engine with plugins for AR SDKs that you may like to investigate:

- Unity student plan
- Free Unity licenses for education
- Unreal engine for education

Included below are some open source SDKs.

Independent platform with no coding requirement

- Arloopa – open source online
- Overlyapp – free online educational solution and paid plan
- Brio – cloud-based platform, free and paid plan
- Adobe Aero
- DroidAR – open source Android platform.

Unity and Unreal Engine

- Plugin for Windows, iOS and Android with no coding requirement for basic AR model prototype.
- ARToolKit+ – open source Unreal Plugin and Unity Plugin
- ARToolKitX – open source Unreal Plugin and Unity Plugin
- Vuforia Engine – open source Unity Plugin and Unreal Plugin
- Apple ARKit – open source iOS and iPadOS AR Creation Tools.

Note on availability

As we approach first teaching of this unit from September 2022, more AR SDKs may become available, while others may change to a paid-for service. We will continue to research and will update our information regularly on the OCR website.

For more information visit
ocr.org.uk/cambridgenationals
facebook.com/ocrexams
twitter.com/OCR_Vocational
twitter.com/OCR_ICT
linkedin.com/company/ocr
youtube.com/ocrexams

Call our customer support centre on
01223 553998

Alternatively, you can email us on
support@ocr.org.uk

Visit our online support centre at
support.ocr.org.uk

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