Summer 2021

Rewarding Learning

Summer 2021
Alternative Arrangements: GCSE
Digital Technology Subject Guidance

Version 1.0

Introduction

On 6 January 2021, the Minister of Education, Peter Weir MLA, cancelled all CCEA GCSE, AS and A2 examinations scheduled for January, February, May and June 2021. Instead, the approach to awarding grades in Summer 2021 will be based on teacher professional judgements, with moderation. CCEA has published *GCSE, AS and A Level Awarding Summer 2021 Alternative Arrangements – Process for Heads of Centre* to support teachers and school leaders in determining the appropriate Centre Determined Grades for each student.

In 2021, centres are asked to use a range of evidence to arrive at a professional and academic judgement of the standard at which each student is performing in the context of the specification for which they are entered and from this provide a grade to CCEA. This is different from 2020, when centres were asked to supply a centre assessment grade based on their judgement of the grade a student would likely have achieved if they had been able to complete examinations. It will require centres and CCEA to develop and use different processes from those used last year.

This document follows on from CCEA's *GCSE, AS and A Level Awarding Summer 2021 Alternative Arrangements – Process for Heads of Centre* and aims to provide further guidance to support teachers and Heads of Department in determining the appropriate Centre Determined Grade for each student entered for GCSE Digital Technology.

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1. Overview

Each Centre Determined Grade is a judgement of the final grade for a qualification. It must be based on a holistic review of a student's performance as indicated by assessment evidence, gathered and retained at centre level. In the interests of fairness within and across centres, each Centre Determined Grade must be a realistic, evidence-based judgement of the standard at which a student is performing, i.e. their demonstrated knowledge, understanding and skills in the content of the specification they have covered. This means students **do not** need to have completed a specified amount of content, or demonstrate skills, knowledge and understanding across every area of the specification, as they would normally. In this way, disruption to teaching and learning can be taken into account.

We must also acknowledge the decision taken in October 2020 by the Education Minister in respect of reducing the assessment burden in GCSE qualifications. The details in the table below will still be applicable in forming a Centre Determined Grade in Summer 2021. For example, if following the Multimedia route, teachers can consider evidence for either Units 2 and 3 or all three units.

Route A: Multimedia

Subject	Current Arrangements	Defined Unit For Omission	Specification Adaptations
GCSE Digital Technology	Unit 1 external assessment (30%) Unit 2 external assessment (40%) Unit 3 controlled assessment (30%)	**Unit 1**	Unit 1 – will be eligible for omission for candidates cashing in for the qualification level grade in Summer 2021. This unit will still be available for any candidates wishing to be assessed in all units.

Route B: Programming

Subject	Current Arrangements	Defined Unit For Omission	Specification Adaptations
GCSE Digital Technology	Unit 1 external assessment (30%) Unit 4 external assessment (40%) Unit 5 controlled assessment (30%)	**Unit 1**	Unit 1 – will be eligible for omission for candidates cashing in for the qualification level grade in Summer 2021. This unit will still be available for any candidates wishing to be assessed in all units.

2. Preliminary Considerations

In arriving at a Centre Determined Grade for a student, it is not necessary to assess every aspect of the specification exhaustively. A selection of key tasks or assessments carried out under appropriate conditions and with a suitable level of demand, which allows you to authenticate the work as the student's own, will give a good indication of the standard at which the student is performing in the qualification.

To make accurate judgements, you must have a clear understanding of:

- the range of skills, knowledge and understanding covered by the specification;
- the assessment requirements and the structure of the specification;
- the grade descriptions at key grades (see Section 5 and Appendix 1 in this document);
- the level of demand of the qualification assessments; and
- the weighting of each component/unit and the type of assessment.

For GCSE Digital Technology, information on these aspects can be found in the specification and further illustrated in the specimen assessment materials, past papers[1] and controlled assessment tasks which are available on the CCEA website at **www.ccea.org.uk**

A piece of evidence has high validity and reliability if a student who performs well in the task would reasonably be expected to perform equally well in the qualification as a whole. Some considerations that may impact on evidence are noted below.

- **Specification Coverage**
  A piece of evidence that covers a greater breadth of the specification content, knowledge, understanding and skills from a unit (or units) with a higher weighting may give a better indication of a student's standard of performance than a piece with lesser breadth or with a lower weighting. Evidence does not need to cover the entire specification content.

- **Similarity to Actual Qualification Assessments**
  Evidence that is similar to a CCEA assessment for the qualification will be more useful in determining a student's grade than evidence that is considerably different from the qualification assessment in terms of question structure, content and/or assessment arrangements.

- **Controls**
  If evidence is generated under less controlled conditions than a qualification assessment, its value may be less than a piece generated under conditions that are similar. Centres should keep a record of the conditions under which an assessment was completed, i.e. high, medium or limited levels of control – see **Appendix 2** for definitions.

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[1] Past papers and mark schemes will be available for all CCEA GCSE, AS and A level qualifications subject to copyright clearance.

However, CCEA understands the difficult public health context in which schools have been working since March 2020, which has included two extended periods of remote learning. Schools may, therefore, need to utilise evidence generated within more limited levels of control, where they can authenticate this as the student's own.

- **Level of Demand**
  The evidence you gather must be set at an appropriate level of demand for it to be a good indicator of a student's standard of performance.

- **When Evidence Is Generated**
  It should be borne in mind that a student's knowledge, understanding and skills may develop over the period of a course of study; you should consider when any piece of evidence was generated and ensure, if possible, that evidence generated recently is taken into account.

3. Evidence to Inform Centre Determined Grades

This section provides guidance on the information that centres should use in confirming Centre Determined Grades.

You should consider all the key evidence you have for each student and reflect on how much it tells you about the student's standard of performance, as measured against the requirements of the relevant specification. For example, this could be, but is not limited to:

- the consistency of a student's practical or performance evidence;
- their depth or breadth of knowledge and understanding in relation to questions on key topics;
- their degree of analytical or evaluative skills demonstrated on key topics; and/or
- quality of student responses to discriminating questions or tasks.

Centres should be clear in their Centre Determined Grades policy what types of evidence will be used in determining the grade. Centres should also be clear with students the evidence that will be used to determine their grades. Where possible, centres should aim to use consistent sources of evidence for a qualification cohort. Some examples of evidence suitable for GCSE Digital Technology you may choose to use are included in the following table:

Evidence
Performance in Unit 3: Digital Authoring Practice or Unit 5: Digital Development Practice – This can be used as evidence even if these have not been fully completed.
CCEA assessment resources for Unit 1, 2 and Unit 4 – When taken under high control conditions, where the public health situation allows, these assessments will be a good indicator of the standard of student performance as they are fully aligned to specification content and the level of demand of past papers. See Section 4 for more details.
Performance in any mock examinations taken – These are likely to be a good indicator of performance, particularly if they are taken under high control conditions and assess the skills, knowledge and understanding required by the CCEA specification or are similar to CCEA question papers.
Performance in CCEA past paper questions and mark schemes – These assessments are in the public domain and can be readily accessed by students. Therefore, in their entirety, they do not form strong evidence. However, elements of these can be incorporated into mock exams or class tests. You may wish to access grade boundaries and/or Chief Examiner's reports which relate to these papers, available at www.ccea.org.uk. If the examinations in the qualifications you deliver are marked online, you can also avail of the data held in the CCEA Analytics application. Further information can be obtained by contacting CCEA at CCEA.Analytics@ccea.org.uk
Performance in class tests – If class tests only assess specific content, you should use a series of marked class tests. A series of such assessments, done under high control conditions and sampling the key aspects of the specification, should provide good evidence of student performance. Many class tests will be recorded as a mark or percentage, and centres should ensure there is a consistent approach in mapping these to a grade.
Records of each student's performance throughout their study – This includes, for example, progress review/tracking data, classwork and bookwork.
For GCSE students who sat units prior to Summer 2021, their notional unit grades in that subject – It is likely that only students studying Single and Double Award Science will have completed prior units.
Performance in any class assessments taken throughout their study of the GCSE Digital Technology specification – This may consist of a variety of evidence types, produced under different conditions.
For resitting students, prioritise evidence generated during the 2020/21 academic year.

Assessment Objectives

Assessment objectives are the skills that are normally assessed through the completion of examinations or internally assessed tasks. They are the foundations on which a specification is developed, and a weighting is applied to each individual assessment objective to show the weighting of assessment associated with it. They may also prove to be a useful indicator of the level of demand of a task or assessment. As such, you

should consider the assessment objectives that will be assessed when selecting evidence to form a holistic judgement of a student's performance. This information will be recorded in the Departmental Assessment Evidence Grid which is set out in Appendix 6 of CCEA's *GCSE, AS and A Level Awarding Summer 2021 Alternative Arrangements – Process for Heads of Centre*.

The assessment objectives for GCSE Digital Technology are:

AO1	demonstrate knowledge and understanding of the concepts, characteristics, components and functions of digital technology
AO2	apply knowledge and understanding of digital technology to investigate and analyse problems and propose solutions
AO3	design, develop and evaluate solutions to solve problems, making reasoned judgements and presenting conclusions

Further information on assessment objectives, including weightings associated with individual units, can be found in Section 4: Scheme of Assessment in the subject specification.

When considered alongside the assessment objectives set out above, the following sources and/or types of evidence may be of greatest value in supporting a holistic review of a student's attainment.

Please note that where a unit omission has impacted on an assessment objective, it is *not necessary* to consider evidence for this objective; however, where reliable evidence exists, centres may still wish to consider it in forming a holistic judgement.

Assessment Objective 1
- Work or responses that require the candidate to recall, select and communicate their knowledge and understanding of the concepts, characteristics, components and functions of digital technology.
- Evidenced in shorter questions in the CCEA assessment resources or mock examinations, past paper questions or class tests in Units 1, 2 and 4.
- Also evidenced by the candidate demonstrating a thorough knowledge and understanding of the structures of multimedia authoring, database packages or programming languages through the Controlled Assessment.

Assessment Objective 2
- Work or responses that require the candidate to apply skills, knowledge and understanding of digital technology to investigate and analyse problems and propose solutions.
- Evidenced in the Designing a Solution section of the Controlled Assessment.
- Also evidenced in longer response questions in the CCEA assessment resources or mock examinations, past paper questions or class tests in Units 1, 2 and 4. These questions will involve interpretation or application of knowledge.

Assessment Objective 3
- Work or responses that require the candidate to analyse and evaluate digital technology solutions to solve problems, making reasoned judgements and presenting conclusions.

- Evidenced in the Building, Testing and Evaluating a Solution sections of the Controlled Assessment.
- Also evidenced in extended writing questions in the CCEA assessment resource or mock examinations, past paper questions or class tests where candidates are asked to propose solutions and evaluate outcomes.

4. Support

A range of subject-specific support is available on the CCEA website and can assist teachers in arriving at a fair and consistent judgement for students.

CCEA 2021 Assessment Resources

In 2020, many students seeking a GCSE or GCE qualification grade had been awarded notional unit grades or uniform mark scores in previous examination series, to use as evidence in determining centre assessment grades; however, this is not the case in 2021. In the absence of this information, CCEA will supply assessment resources to your centre. These will be quality assured question papers and mark schemes for **all** units that normally have examinations.[2] They will contain new questions and tasks not previously released to centres and must therefore be stored securely. These materials are not to be seen as high stakes assessments but rather viewed as materials which could form part of the evidence used to inform Centre Determined Grades. Centres do not have to use all the assessment resources, but we advise centres to use at least one per qualification. We would encourage centres to use the assessment resources under high control conditions, where it is safe to do so, to ensure they have the greatest value.

We appreciate that decisions were taken in October 2020 in respect of unit omissions in GCSE qualifications. We also acknowledge disruption to teaching and learning may mean that even in the context of these omissions, certain content may not have been covered. In such cases, the assessment resources may be adapted accordingly. In this way, it can be taken into account that some students have suffered more disruption to their learning than others. For example:

A centre, following the Programming route, decided to omit Unit 1 in line with the Education Minister's announcement in October 2020. Therefore, Centre Determined Grades may be based on evidence for Units 4 and 5 only.

- *Student A has missed a significant amount of learning due to COVID self-isolation and disruptions and has not covered all of the content for Unit 4.*
- *Student A's Centre Determined Grade should be based on assessment of only the content she has covered.*

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[2] Assessment resources will not be provided for units/components where endorsement arrangements in lieu of assessments were in place for Summer 2021, for example GCSE Languages Unit 2: Speaking.

Assessments adapted/Evidence gathered and reviewed based on GCSE Digital Technology Content	
All Students	**Student A**
• Unit 4 – Contemporary trends in software development – Digital data – Digital design principles – Programming constructs – Simple error handling techniques – Developing test plans and testing a solution – Evaluation of digitally authored systems against a set of user requirements. • Unit 5	• Unit 4 – Digital design principles – Programming constructs – Simple error handling techniques – Developing test plans and testing a solution – Evaluation of digitally authored systems against a set of user requirements. • Unit 5

CCEA will provide mark schemes to centres. To support a standardised approach in the use of the assessment resources, we will provide guidance to accompany the mark scheme.

Summer 2021 Support Webinar

We will produce subject-specific support webinars for teachers to accompany this guidance document. These will include an overview of arriving at a Centre Determined Grade and additional guidance in using the CCEA assessment resources and existing support materials. Subject-specific webinars will be uploaded to the CCEA website from 26 March 2021.

Specimen Assessment Materials and Past Papers

Specimen assessment materials and past papers are available in the Support section of the qualification web page and are provided to give centres guidance on the structure and character of CCEA examination papers and assessments. Please note that if a past paper or mark scheme does not appear in this section, it is for copyright reasons.

You may also wish to create a question paper that is of a similar standard to a CCEA GCSE question paper. In doing so, you should refer to the specimen question paper and mark schemes, and the past papers and mark schemes, available on the CCEA qualification web page. These illustrate the standard, structure and requirements of the question paper.

You can generate the most valid evidence by using assessments that replicate, as far as possible, the standard, duration, format and security of CCEA question papers.

Exemplification of Examination Performance (EEP)

EEP booklets are available in the Support section of the qualification web page and include exam questions from the Summer 2019 papers, exemplar answers by students and a senior examiner commentary on the answers.

Agreement Trial Materials

The agreement trial for Summer 2021 is available at https://training.ccea.org.uk/course/view.php?id=131. Please note these agreement trials were produced before the cancellation of examinations for 2021. However, they will still be useful in providing guidance on the requirements of internally assessed units and the CCEA standard to be applied in marking them.

Chief Examiner/Principal Moderator Reports

The reports for 2018–2019 Summer series are available in the Reports section of the qualification web page and outline the performance of students in all aspects of this qualification.

CCEA Grade Boundaries

Raw to uniform mark boundaries for past Summer series are available in the Support section of the qualification web page and may provide a reference point to support Centre Determined Grades.

CCEA Analytics

You can also avail of the data held in the CCEA Analytics application. Further information can be obtained by contacting CCEA at CCEA.Analytics@ccea.org.uk

5. Making Decisions about Centre Determined Grades

Before deciding Centre Determined Grades you should agree as a department the evidence you will review (see Section 3 for some examples). Once the decision has been made, this should be set out in your centre's Centre Determined Grades policy and be included in the Departmental Assessment Evidence Grid, referenced in Section 3, that will form part of the evidence base.

When making decisions, take into consideration the amount of specification coverage and if this applies to all students. Adapt as necessary for individual students the evidence you will review, to account for those students who may have encountered more significant disruption. Evidence does not have to be in the same format for every student, but teachers should be satisfied that the evidence is reliable to make an informed holistic judgement of that student's attainment.

Internal Standardisation

In subjects where there is more than one teacher and/or class in the department, it is a requirement to carry out internal standardisation. The purpose of internal standardisation is to provide teachers with confidence in the Centre Determined Grades they have assigned, to ensure fairness and objectivity of decisions, and to ensure consistency in the application of assessment criteria and standards.

Where more than one teacher is involved in marking the assessment, the application of the mark scheme must be agreed before marking begins.

When marking is complete, internal standardisation must be conducted to ensure <u>all</u> markers have applied the mark scheme consistently and accurately.

Internal standardisation should include cross-marking samples of work across the full range of attainment and include students' work from each class **to ensure a common standard within a department is applied.**

Grade Descriptions

Grade descriptions set out the characteristics of performance at key grades in the grade range for a qualification, in terms of both content covered and the skills developed (assessment objectives) over the course of study. These should be used to form the basis of your decisions on the Centre Determined Grades that will be awarded to your students in Summer 2021.

Grade descriptions are provided at Grades **A, C** and **F** in the GCSE specification, to give a general indication of the standards of achievement likely to have been shown by students awarded these grades. Teachers should refer to these descriptions to support their judgements when arriving at their Centre Determined Grades for students**.**

Please note that shortcomings in some aspects of students' performance in assessments may be balanced by better performances in others.

Please see Appendix 1 for the Grade Descriptions at A, C and F for GCSE. These also include the type of assessment objective evidence you may wish to use and the key features associated with each grade.

Practical Application of Grade Descriptions

To select the most appropriate grade for a student, teachers may use the following approach:

1. Familiarise yourself with the grade descriptions for the subject.

2. Consider support materials such as those set out in Section 4 of this document.

3. Before you arrive at a holistic grade for a student's performance, review the evidence available. At this stage you may wish to make notes to record the qualities that are being looked for.

4. Consider the positive features of the evidence, based on the key features described in the Appendix.

5. Using the descriptions for Grades A, C and F, based on the principle of 'best fit', select the grade you believe comes closest to encapsulating the overall achievement of the student as demonstrated by the evidence. Using this grade as a benchmark, work **either up or down** using the table below to find the final grade.

For example:

a) *if you are of the view that the candidate's evidence meets the description for grade C, consider this first; if the supporting evidence is strong, you may then wish to go up to the grade above and decide if the evidence meets this, and so on, until you have a best fit between the grade description and the student's work; or*

b) *if you are of the view that the candidate's evidence <u>does not</u> meet the description for grade C, then go down to the grade below and decide if it meets this, and so on, until you have a best fit between the grade description and the student's work.*

The table below summarises this approach:

Grade	Description/Advice
A*	Candidates at grade A* clearly demonstrate all of the features associated with performance at 'A' but in many areas elements of the evidence presented are exceptional, i.e. beyond that which would reasonably be expected of a candidate working at grade 'A'.
A	*See Grade A Description.*
B	Candidates at grade 'B' may demonstrate some elements of grade 'A' performance in the evidence presented but, because of limitations in other aspects of their work, not to the extent that an assessor could confidently award a grade 'A'.
C*	Candidates at grade C* clearly demonstrate all of the features associated with performance at grade 'C' but in many areas the evidence presented contains elements showing that the candidate is working at a grade beyond that which would reasonably be expected of a candidate working at grade 'C'.
C	*See Grade C Description.*
D	Candidates at grade 'D' may demonstrate some elements of grade 'C' performance in the evidence presented but, because of limitations in other aspects of their work, not to the extent that an assessor could confidently award a grade 'C'.
E	Candidates at grade 'E' clearly demonstrate all of the features associated with performance at 'F' but in many areas the evidence presented contains elements showing that the candidate is working at a grade beyond that which would reasonably be expected of a candidate working at grade 'F'.
F	*See Grade F Description.*
G	Candidates at grade 'G' may demonstrate some elements of grade 'F' performance in the evidence presented but, because of limitations in other aspects of their work, not to the extent that an assessor could confidently award a grade 'F'.

6. Further Advice and Information

Summer 2021 presents us with significant challenges, particularly teachers and students, and we hope the information set out in this document supports you through the process of awarding Centre Determined Grades this year. The information in this document will be supplemented with a webinar, which amongst other things will provide additional guidance on how to apply grade descriptions to the process of arriving at Centre Determined Grades for each of your students.

If in the interim you require further information, please contact:

CCEA Helpline	Email: helpline@ccea.org.uk Telephone: **028 9026 1220**. The helpline is operational each day from 9am to 5pm, Monday to Friday, for centres with queries in relation to Summer 2021. All other queries should be directed to centresupport@ccea.org.uk
CCEA Entries	entriesandresults@ccea.org.uk
Subject Officer	Andrew Douglas adouglas@ccea.org.uk
Specification Support Officer	Nuala Tierney ntierney@ccea.org.uk

Appendix 1

GCSE Grade Descriptions and Key Features – Digital Technology (Multimedia)

Assessment Objective	AO1 demonstrate knowledge and understanding of the concepts, characteristics, components and functions of digital technology		
Grade Descriptions	**A**	**C**	**F**
	• Candidates recall, select and communicate a thorough knowledge and understanding of the function, application, merits and implications of a broad range of computer hardware and software and other related technologies.	• Candidates recall, select and communicate a good knowledge and understanding of the function, application, merits and implications of a broad range of computer hardware and software and other related technologies.	• Candidates recall, select and communicate a basic knowledge and understanding of the function and application of a broad range of computer hardware and software and other related technologies.
AO1 Evidence	**Grade A Key Features**	**Grade C Key Features**	**Grade F Key Features**

Controlled Assessment (Unit 3)
 	
 CCEA Assessment Resource
 	
 Mock examinations
 	
 CCEA past paper questions
 	
 Class tests
 	
 Classwork
 	
 Bookwork
	The candidate has demonstrated a thorough knowledge and understanding of the structures of multimedia authoring and database packages.
	
	 A thorough understanding of the following multimedia features which is highly suitable for the target audience:
	 • templates (including a form);
	 • hypertext which supports internal and external navigational links;
	 • optimised media types, which should include:
	   – an original video;
	   – an original animation; and
	   – appropriate sound;
	 • scripted elements which aid the interactivity of the solution;
	 • accessibility elements.
		The candidate has demonstrated a good knowledge and understanding of the structures of multimedia authoring and database packages.
		
		 A good understanding of the following multimedia features which is suitable for the target audience:
		 • templates (including a form);
		 • hypertext which supports internal and external navigational links;
		 • optimised media types, which should include:
		   – an original sound/video or animation;
		 • a scripted or an accessibility element.
			The candidate has demonstrated a basic knowledge and understanding of the structures of multimedia authoring and database packages.
			
			 A basic understanding of the following multimedia features:
			 • templates (including a form);
			 • hypertext which supports internal and external navigational links;
			 • optimised media types, which should include:
			   – an original sound/video or animation.

	Select the following features of a database application to support the creation of an interactive solution which is highly suitable for the target audience: • tables with appropriate length checks, validation, use of lookup lists and input masks; • appropriate relationships between tables; • forms for data input; • a menu system for ease of navigation; • complex and simple queries; • reports incorporating the use of grouping, sorting, calculations and headers and footers where appropriate; • macros for process automation. The candidate can recall, select and communicate **detailed** knowledge and understanding of the function, application, merits and implications of a **broad** range of computer hardware and software and other related technologies.	Select the following features of a database application to support the creation of an interactive solution which is suitable for the target audience: • tables with length checks, validation, use of lookup lists and input masks; • appropriate links between tables; • forms for data input; • a menu system for ease of navigation; • simple queries; • reports incorporating the use of grouping or sorting. The candidate can recall, select and communicate knowledge and understanding of the function, application, merits and implications of a **reasonable** range of computer hardware and software and other related technologies.	Select the following features of a database application to support the creation of an interactive solution: • tables with some length checks, validation, lookup lists or input masks; • forms for data input; • a basic menu system; • simple queries; • basic reports. The candidate can recall, select and communicate **limited** knowledge and understanding of the function, application, merits and implications of a **limited** range of computer hardware and software and other related technologies.

Assessment Objective	AO2 apply knowledge and understanding of digital technology to investigate and analyse problems and propose solutions		
	A	**C**	**F**
Grade Descriptions	• Candidates apply knowledge, understanding and skills to a variety of situations, selecting and using a range of digital technology tools efficiently, including high-level programming languages, to solve problems and produce effective digital technology based solutions. • Candidates manipulate and process data efficiently and effectively. They model situations, sequence instructions, and interpret information effectively, and explore and develop ideas creatively. • Candidates work systematically and understand and adopt safe, secure and responsible practices.	• Candidates apply knowledge, understanding and skills in a range of situations, selecting and using a range of digital technology tools, including high-level programming languages, to solve problems and produce digital technology based solutions. • Candidates select information and process data. They model situations, sequence instructions, select and use information, and explore ideas. • Candidates work using safe, secure and responsible practices.	• Candidates apply limited knowledge, understanding and skills using a range of digital technology tools, including high-level programming languages, to solve problems and produce basic digital technology based solutions. • Candidates select information and process data. They use simple model situations to select and use information • Candidates demonstrate some awareness of the need for safe, secure and reasonable practices.
AO2 Evidence	**Grade A Key Features**	**Grade C Key Features**	**Grade F Key Features**
Controlled Assessment (Unit 3) **1 (a) Designing a multimedia solution using appropriate tools**	The candidate has successfully designed a high quality multimedia solution. User requirements and target audience needs have been clearly identified. Detailed planning for third party implementation is evident through: navigational structure diagrams, storyboarding (showing all elements including pages, video/animation and interactive/accessibility features). Details of all images/sound sources and scripted elements have been included.	The candidate has successfully designed a multimedia solution. User requirements have been identified. Planning for third party implementation is evident through: navigational structure diagrams, storyboarding (showing the majority of all elements including pages, video/animation and interactive/accessibility features).	The candidate has designed a limited multimedia solution. User requirements have been poorly identified. Some planning is evident through: navigational structure diagrams and storyboarding.

	Prototyping and the use of feedback in refining the solution is evident.	Prototyping has been attempted and there is some feedback in refining the solution.	
1 (b) Designing a database solution using appropriate tools	The candidate has successfully designed an appropriately structured relational database with all relevant fields. There is detailed planning of required database features, for example linking tables illustrated using an ERD, key fields, validation checks and data capture forms. User requirements have been clearly identified with details of all input, output and processing included. The front-end user interface, forms, reports (grouping,sorting, calculations), queries (complex) and macros have been designed to allow for third party implementation.	The candidate has designed an adequate relational database with some relevant fields. The candidate has planned some database features appropriately for example two to three of the following: reference to how the tables in the solution are limited, key fields, validation checks and data capture forms. User requirements have been identified with details of most input, output and processing included. The front-end user interface, forms, reports (grouping, sorting), queries (simple) have been designed to an acceptable standard.	The candidate has designed a database with limited or no use of appropriate fields. User requirements have not been clearly identified, with limited reference to input, output and processing.
CCEA Assessment Resource **Mock examinations** **CCEA past paper questions** **Class tests** **Classwork** **Bookwork**	The candidate applies knowledge, understanding and skills to a **wide variety** of situations, selecting and using a range of digital technology tools efficiently to produce **effective** algorithmic or coded solutions to problems. The candidate manipulates and processes data **accurately and effectively.** They model situations making **highly appropriate** use of data structures, sequence, selection and iteration to produce efficient solutions which represent a full solution to a problem.	The candidates applies knowledge, understanding and skills in a **range of situations**, selecting and using digital technology tools to produce algorithmic or coded solutions to problems. The candidate manipulates and processes data **accurately.** They model situations making **appropriate** use of data structures, sequence, selection and iteration to produce efficient solutions to solve a problem.	The candidate applies **limited** knowledge, understanding and skills, selecting and using digital technology tools to produce algorithmic or coded solutions to problems. The candidate processes data and models situations making use of data structures, sequence, selection and iteration to produce solutions to solve a problem.

	The candidate analyses problems **systematically** and reviews solutions to **fully** evaluate a digital technology-based solution.	The candidate analyses problems and reviews solutions to evaluate a digital technology-based solution.	The candidate reviews solutions to evaluate a digital technology-based solution.

Assessment Objective	AO3 design, develop and evaluate solutions to solve problems, making reasoned judgements and presenting conclusions		
	A	**C**	**F**
Grade Descriptions	• Candidates analyse problems systematically, identifying needs and opportunities. • Candidates review their work iteratively and make improvements where appropriate. • Candidates use digital technology to communicate effectively, demonstrating a clear sense of purpose and audience.	• Candidates analyse problems, identifying needs and opportunities. • Candidates review their work and make improvements where appropriate. • Candidates use digital technology to communicate, demonstrating a clear sense of purpose and audience.	• Candidates respond to needs using digital technology. • Candidates sometimes review their work and make some modifications. • Candidates use digital technology to communicate, demonstrating a limited sense of purpose and audience.
AO3 Evidence	**Grade A Key Features**	**Grade C Key Features**	**Grade F Key Features**
Controlled Assessment (Unit 3): **2 (a) Building the multimedia solution**	The candidate has produced a high-quality multimedia solution which is highly suitable for the target audience. The solution makes effective use of: templates, hypertext, optimised media, appropriate sound, original video, original animation. Scripted elements aid the interactivity of the solution. A range of accessibility elements are included.	The candidate has produced a good quality multimedia solution which is suitable for the target audience. The solution makes use of: templates, hypertext, optimised media, sound, original video or animation. Scripted or an accessibility element has been used.	The candidate has produced a basic quality multimedia solution. The solution makes use of: templates, hypertext, optimised media, video or animation and sound.
Controlled Assessment (Unit 3): **2 (b) Building the database solution**	The candidate has produced an excellent database solution which is highly suitable for the target audience. Tables are linked with appropriate relationships, have appropriate validation, lookup lists and input masks. Forms and navigation are user friendly and intuitive.	The candidate has produced a good database solution which is suitable for the target audience. Tables are linked, have appropriate validation, lookup lists and input masks. Forms and navigation are user friendly and intuitive.	The candidate has produced a basic database solution. Tables have some validation, lookup lists and/or input masks. Forms, navigation, basic queries and reports have been attempted.

	Complex queries using two or more criteria and logical operators have been implemented. Reports incorporate the use of grouping, sorting, calculations and headers/footers.	Queries using two or more criteria and logical operators have been implemented. Reports may incorporate the use of grouping or sorting and headers/footers.	
Controlled Assessment (Unit 3): **3 Testing the database solution**	The candidate has successfully designed a detailed test plan derived from user requirements. The test plan is well structured in tabular format and incorporates a range of tests. Testing data includes valid, invalid and extreme data. Errors are clearly identified and testing reflects the general robustness of the system.	The candidate has successfully designed a test plan derived from user requirements. The test plan is structured in tabular format and incorporates a range of tests. Testing data includes valid, invalid and/or extreme data. Errors are identified and testing reflects the general robustness of the system.	The candidate has successfully designed a partial test plan. The test plan has some structured in tabular format. Testing data includes valid and invalid data.
Controlled Assessment (Unit 3): **4 Evaluating the multimedia and database solution**	The candidate has produced a well-structured evaluation of both solutions with clear reflection on the extent to which the user requirements have been met. Performance and robustness issues have been included. Refinements are clearly identified.	The candidate has produced a good evaluation of both solutions with reflection on the extent to which the user requirements have been met. Performance and robustness issues have been included. Some refinements are identified.	The candidate has produced an evaluation of the database or multimedia solution with limited reflection on the extent to which user requirements have been met.
CCEA Assessment Resource **Mock examinations** **CCEA past paper questions**	The candidate **systematically** reviews a solution to a problem and suggests or makes improvements where appropriate. The candidate demonstrates a **clear** sense of purpose and audience through the application of **thorough** testing and evaluation, to improve a solution.	The candidate reviews a solution to a problem and suggests or makes improvements where appropriate. The candidate demonstrates a sense of purpose and audience through the application of testing and evaluation, to improve a solution.	The candidate sometimes reviews their work and makes some modifications. The candidate demonstrates a **limited** sense of purpose and audience through the application of **some** testing and evaluation.

Class tests **Classwork** **Bookwork**			

GCSE Grade Descriptions and Key Features – Digital Technology (Programming)

Assessment Objective	AO1 demonstrate knowledge and understanding of the concepts, characteristics, components and functions of digital technology		
	A	**C**	**F**
Grade Descriptions	• Candidates recall, select and communicate a thorough knowledge and understanding of the function, application, merits and implications of a broad range of computer hardware and software and other related technologies.	• Candidates recall, select and communicate a good knowledge and understanding of the function, application, merits and implications of a broad range of computer hardware and software and other related technologies.	• Candidates recall, select and communicate a basic knowledge and understanding of the function and application of a broad range of computer hardware and software and other related technologies.
AO1 Evidence	**Grade A Key Features**	**Grade C Key Features**	**Grade F Key Features**
Controlled Assessment (Unit 5) **CCEA Assessment Resource** **Mock examinations** **CCEA past paper questions** **Class tests** **Classwork** **Bookwork**	The candidate has demonstrated a thorough knowledge and understanding of the structures of a programming language. Select a wide range of appropriate features of an IDE to support the creation of high quality solution: • Code editor; • Simple debugging tools; • Compiler; • Error diagnostics; • Runtime environment; • Graphical User Interface, where appropriate. The candidate can recall, select and communicate **detailed** knowledge and understanding of the function, application, merits and implications of a **broad** range of computer hardware and software and other related technologies.	The candidate has demonstrated a good knowledge and understanding of the structures of a programming language. Select a range of appropriate features of an IDE to support the creation of a working solution: • Code editor; • Simple debugging tools; • Compiler; • Error diagnostics; • Runtime environment; • Graphical User Interface, where appropriate. The candidate can recall, select and communicate knowledge and understanding of the function, application, merits and implications of a **reasonable** range of computer hardware and software and other related technologies.	The candidate has demonstrated a basic knowledge and understanding of the structures of a programming language. Select some features of an IDE to support the creation of a partially working solution: • Code editor; • Simple debugging tools; • Compiler; • Error diagnostics; • Runtime environment; • Graphical User Interface, where appropriate. The candidate can recall, select and communicate **limited** knowledge and understanding of the function, application, merits and implications of a **limited** range of computer hardware and software and other related technologies.

Assessment Objective	AO2 apply knowledge and understanding of digital technology to investigate and analyse problems and propose solutions		
	A	**C**	**F**
Grade Descriptions	• Candidates apply knowledge, understanding and skills to a variety of situations, selecting and using a range of digital technology tools efficiently, including high-level programming languages, to solve problems and produce effective digital technology based solutions. • Candidates manipulate and process data efficiently and effectively. They model situations, sequence instructions, and interpret information effectively, and explore and develop ideas creatively. • Candidates work systematically and understand and adopt safe, secure and responsible practices.	• Candidates apply knowledge, understanding and skills in a range of situations, selecting and using a range of digital technology tools, including high-level programming languages, to solve problems and produce digital technology based solutions. • Candidates select information and process data. They model situations, sequence instructions, select and use information, and explore ideas. • Candidates work using safe, secure and responsible practices.	• Candidates apply limited knowledge, understanding and skills using a range of digital technology tools, including high-level programming languages, to solve problems and produce basic digital technology based solutions. • Candidates select information and process data. They use simple model situations to select and use information • Candidates demonstrate some awareness of the need for safe, secure and reasonable practices.
AO2 Evidence	**Grade A Key Features**	**Grade C Key Features**	**Grade F Key Features**
Controlled Assessment (Unit 5): **1. Design a solution using appropriate tools**	The candidate has successfully designed a high quality programming solution, using appropriate design tools, e.g. flowchart, pseudo code, etc. to produce a fully decomposed solution. A comprehensive set of data requirements (inputs, processes,outputs, interface and report design) have been developed for the proposed solution. The data requirements show enough detail to enable a fully functioning programme to be developed.	The candidate has developed a clear set of data requirements for the proposed solution. The candidate has successfully designed a basic solution, using some design tools e.g. data flow diagrams, pseudo code etc. to produce a working solution. A basic set of data requirements (inputs, processes, outputs, interface and report design) have been developed for the proposed solution.	The candidate has designed a limited programming solution. A limited set of data requirements have been developed for the proposed solution. The data requirements show enough detail to enable a partially functioning programme to be developed. Little evidence of validation is included in the design solution. Target audience poorly identified and little or no evidence of design refinement.

	Target audience needs have been clearly identified. Full consideration has been given to appropriate help for the user of the system. Validation and error trapping techniques are designed to ensure that the candidate produces a robust program. The use of user feedback to refine the solution based on the issues identified during the design process is evident.	The data requirements show enough detail to enable a basic functioning program to be developed. Target audience needs have been identified. Some evidence of validation is included in the design to ensure that the candidate produces a robust program. Some evidence of design refinement based on the issues identified during the design process are produced.	
CCEA Assessment Resource **Mock examinations** **CCEA past paper questions** **Class tests** **Classwork** **Bookwork**	The candidate applies knowledge, understanding and skills to a **wide variety** of situations, selecting and using a range of digital technology tools efficiently to produce **effective** algorithmic or coded solutions to problems. The candidate manipulates and processes data **accurately and effectively.** They model situations making **highly appropriate** use of data structures, sequence, selection and iteration to produce efficient solutions which represent a full solution to a problem. The candidate analyses problems **systematically** and reviews solutions to **fully** evaluate a digital technology-based solution.	The candidates applies knowledge, understanding and skills in a **range of situations**, selecting and using digital technology tools to produce algorithmic or coded solutions to problems. The candidate manipulates and processes data **accurately.** They model situations making **appropriate** use of data structures, sequence, selection and iteration to produce efficient solutions to solve a problem. The candidate analyses problems and reviews solutions to evaluate a digital technology-based solution.	The candidate applies **limited** knowledge, understanding and skills, selecting and using digital technology tools to produce algorithmic or coded solutions to problems. The candidate processes data and models situations making use of data structures, sequence, selection and iteration to produce solutions to solve a problem. The candidate reviews solutions to evaluate a digital technology-based solution.

Assessment Objective	AO3 design, develop and evaluate solutions to solve problems, making reasoned judgements and presenting conclusions		
	A	C	F
Grade Descriptions	• Candidates analyse problems systematically, identifying needs and opportunities. • Candidates review their work iteratively and make improvements where appropriate. • Candidates use digital technology to communicate effectively, demonstrating a clear sense of purpose and audience.	• Candidates analyse problems, identifying needs and opportunities. • Candidates review their work and make improvements where appropriate. • Candidates use digital technology to communicate, demonstrating a clear sense of purpose and audience.	• Candidates respond to needs using digital technology. • Candidates sometimes review their work and make some modifications. • Candidates use digital technology to communicate, demonstrating a limited sense of purpose and audience.
AO3 Evidence	Grade A Key Features	Grade C Key Features	Grade F Key Features
Controlled Assessment (Unit 5): 2. Building a solution	The candidate has produced a high-quality solution to the proposed problem. The solution has used appropriate features of the integrated development environment to support the creation of the program. The interface is appropriate for the target audience and matches all data and design requirements. An annotated solution is evident showing the use of appropriate data types, data structures, control structures, string handling, functions, logical and arithmetic operators. Validation and help features are evident throughout solution.	The candidate has produced a working solution to the proposed problem. The solution used some of the features of the integrated development environment to support the creation of the solution. The interface matches most of the data and design requirements. A solution is produced, showing the use of data types, data structures, control structures, string handling, functions, logical and arithmetic operators. Basic validation and help features are evident in the solution.	The candidate has produced a partially working solution to the proposed problem. Some evidence of the integrated development environment was used in the creation of the solution. Some evidence of a solution is produced, showing the use of the features required to develop a solution.

Controlled Assessment (Unit 5): **3. Testing the solution**	The candidate has demonstrated an excellent application of the knowledge and skills required to fully test the solution. Detailed evidence of a successfully designed test plan derived from user requirements was produced. The test plan is well structured, in tabular format (showing tests, expected outcome, actual outcome and a range of fixes). Incorporates a range of tests (black and white box testing) and includes valid, invalid and extreme test data. Errors are clearly identified and a working solution developed. Testing reflects the general robustness of the system.	The candidate has demonstrated a good application of the knowledge and skills required to test the solution. Evidence of a successfully designed test plan derived from user requirements is produced. The test plan is structured in tabular format (showing tests, expected outcome, actual outcome and some fixes) and incorporates a range of tests (black and white box testing). Test data includes valid, invalid and extreme data. Errors are identified and solution is offered.	The candidate has successfully designed a partial test plan. The test plan has some tabular format structure. Testing data includes valid and invalid data.
Controlled Assessment (Unit 5): **4. Evaluating the solution**	The candidate has produced a well-structured evaluation of the solution with clear reflection on the extent to which the user requirements have been met. The test data is fully analysed. Refinements are clearly identified. Performance and robustness of the system is analysed fully.	The candidate has produced a good evaluation of the solution with some reflection on the extent to which the user requirements have been met. Performance of the test data is analysed. Some evidence that refinements are identified. Performance and robustness issues are included.	The candidate has produced an evaluation of the solution with limited reflection on the extent to which user requirements have been met. Limited/no performance or robustness issues have been included. No refinements are identified.

CCEA Assessment Resource **Mock examinations** **CCEA past paper questions** **Class tests** **Classwork** **Bookwork**	The candidate **systematically** reviews a solution to a problem and suggests or makes improvements where appropriate. The candidate demonstrates a **clear** sense of purpose and audience through the application of **thorough** testing and evaluation, to improve a solution.	The candidate reviews a solution to a problem and suggests or makes improvements where appropriate. The candidate demonstrates a sense of purpose and audience through the application of testing and evaluation, to improve a solution.	The candidate sometimes reviews their work and makes some modifications. The candidate demonstrates a **limited** sense of purpose and audience through the application of **some** testing and evaluation.

Appendix 2

Definitions of Levels of Control

Levels of control for the conditions under which students have completed assessments that are internally marked in school are defined as High, Medium and Limited at GCSE. These definitions also align with the conditions of control for GCE and other CCEA qualifications. In recording the levels of control for evidence to be used in Centre Determined Grades for Summer 2021, the following should be used.

High	The use of resources is tightly prescribed. The centre must ensure that: • all students are within direct sight of the teacher/supervisor throughout the session(s); • display materials which might provide assistance are removed or covered; • there is no access to email, the internet or mobile phones; • students complete their work independently; • interaction with other students does not occur; and • no assistance of any description is provided.
Medium	Students do not need to be directly supervised at all times. The use of resources, including the internet, is not tightly prescribed. Centres should ensure that: • there is sufficient evidence to ensure that the individual work can be authenticated; and • the work an individual student submits for assessment is their own. If work has been completed in groups, teachers must ensure that they can determine and assess the individual student's contribution to the work. If work has been completed remotely, it may be useful to ask questions about what they did and how/why they did it, to help authenticate the work.
Limited	Work is completed without any direct supervision and would not normally contribute to assessable outcomes.

Appendix 2

Rewarding Learning