

Summer 2021



# Summer 2021

## Alternative Arrangements: AS and A level Technology and Design Subject Guidance



Version 2.0



## 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 GCE AS or A level **Technology and Design**.

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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 December 2020 by the Education Minister in respect of reducing the assessment burden in GCE AS and A level qualifications. The details in the table below will still be applicable in forming a Centre Determined Grade in Summer 2021. For example, teachers can consider evidence for either AS1, AS2, A21 or A22 or all four units.

Subject	Current Arrangements	Unit For Omission	Specification Adaptations
<b>GCE Technology and Design</b>	<b>AS 1: Compulsory: Design and Materials Option: Systems and Control or Product Design.</b> (50% of AS 20% of A level).	<b>AS</b> Students could choose to sit Unit 1 (20%) <b>or</b> Unit 2 (20%)	No adaptations
	<b>AS 2: Coursework: Product Development</b> (50% of AS 20% of A level).	<b>A2</b> Students could choose to sit Unit 1 (30%) <b>or</b> Unit 2 (30%)	Candidates complete the design folder as far as the development section. 10 marks have been added to the Redesign Solutions and Development section to allow for evaluation of outcomes of modelling to take place. The making, testing and evaluation section has been removed. Centres are allowed to produce the technical drawings required in the portfolio by hand or using software.
	<b>A2 1: Systems and Control or Product Design.</b> (30% of A level).		No adaptations

Subject	Current Arrangements	Unit For Omission	Specification Adaptations
	<p><b>A2 2: Coursework: Product- System Design and Manufacture.</b> (30% of A level).</p>	<p>N/A</p>	<p>Candidates complete the design folder as far as the development section. 10 marks have been added to the development section to allow for evaluation of outcomes of modelling to take place. The making, testing and evaluation section has been removed. Centres are allowed to produce the technical drawings required in the portfolio by hand or using software.</p>

## 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 and 2 in this document);
- the level of demand of the qualification assessments; and
- the weighting of each component/unit and the type of assessment.

For GCE Technology and Design information on these aspects can be found in the specification and further illustrated in the specimen assessment materials, past papers<sup>1</sup> and coursework assessment tasks which are available on the CCEA website at [www.ccea.org.uk](http://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

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<sup>1</sup> Past papers and mark schemes will be available for all CCEA GCSE, AS and A level qualifications subject to copyright clearance.

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 3** for definitions.

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 GCE AS and A level Technology and Design you may choose to use are included in the following table:

Evidence
<p><b>CCEA assessment resources for Unit AS1 and Unit A2 1</b> – 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.</p>
<p><b>Performance in any mock examinations taken</b> – 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.</p>
<p><b>Performance in CCEA past paper questions and mark schemes</b> – 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 <a href="http://www.ccea.org.uk">www.ccea.org.uk</a>. 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 <a href="mailto:CCEA.Analytics@ccea.org.uk">CCEA.Analytics@ccea.org.uk</a></p>
<p><b>Performance in class tests</b> – 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.</p>
<p><b>Records of each student’s performance throughout their study</b> – This includes, for example, progress review/tracking data, classwork and bookwork.</p>
<p><b>Performance in Unit AS2 and Unit A22</b> – This can be used even if these have not been fully completed.</p>
<p><b>Performance in any internally assessed units taken throughout their study of the GCE Technology and Design specification</b> – This may consist of a variety of evidence types, produced under different conditions</p>
<p><b>For resitting students</b>, prioritise evidence generated during the 2020/21 academic year.</p>

## 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 GCE Technology and Design are:

<b>AO1</b>	Demonstrate specific knowledge and understanding; be able to apply that knowledge and understanding in combination with appropriate skills in their designing; communicate ideas and outcomes and demonstrate strategies for evaluation and
<b>AO2</b>	Be able to demonstrate and apply skills, knowledge and understanding of relevant materials, processes, and techniques; use equipment and materials to produce suitable and appropriate outcomes; communicate ideas and outcomes and demonstrate strategies for evaluation.

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

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.

## Using AS Evidence at A Level

For A level, AS evidence may be considered alongside A2 evidence; however, the differences between AS and A2 should be borne in mind. For example, the AS qualification is weighted at 40% of the overall A level and has different grade descriptions. There is also no A\* grade at AS. If AS evidence is used, it must be assessed against the grade descriptions at A2 (see Appendix 2 for more details). If you do decide to use AS evidence to support judgements at A2, this should be reflected in the Centre Determined Grades policy for your centre and in the Candidate Assessment Record, and it should be included in evidence submitted to CCEA for sampling in the CCEA review stage.

## 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. 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 December 2020 in respect of unit omissions in AS and A level 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 decided to omit A2 2 coursework in line with the Education Minister's announcement in December 2020. Therefore, Centre Determined Grades may be based on evidence for A2 1 systems and Control or product Design. Take for example, Section C, if :

- 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 Section C.
- Student A's Centre Determined Grade should be based on assessment of only the content he has covered.

### Assessments adapted/Evidence gathered and reviewed based on A2 1 Product Design Content

All Students	Student A
<ul style="list-style-type: none"> <li>• Environment issues</li> <li>• Product life cycle</li> <li>• Advances in technology and ICT in manufacture</li> <li>• From mind to market</li> <li>• Quality control and assurance</li> <li>• Design for use</li> <li>• Design for manufacture</li> <li>• Design for communication</li> <li>• Technological developments in society.</li> </ul>	<ul style="list-style-type: none"> <li>• Environment issues</li> <li>• Product life cycle</li> <li>• Advances in technology and ICT in manufacture</li> <li>• From mind to market</li> <li>• Design for use</li> </ul>

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 GCE 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 2017 and 2018 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 2017–2019 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](mailto: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 all 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** and **E** in the GCE specification for both AS and A2 level, to give a general indication of the standards of achievement likely to have been shown by students awarded these grades. To support teachers in Summer 2021, we are providing an additional grade description at Grade C. 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 Appendices 1 and 2 for the Grade Descriptions at A, C and E for both AS and A level.** 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 E, 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.
  - 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 does not 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
<b>A*</b> <i>(A2 only)</i>	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'.
<b>A</b>	See Grade A Description.
<b>B</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'.
<b>C</b>	See Grade C Description.
<b>D</b>	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'.
<b>E</b>	See Grade E Description.

## 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	<p><u>Email: <a href="mailto:helpline@ccea.org.uk">helpline@ccea.org.uk</a></u></p> <p>Telephone: <b>028 9026 1220</b>. The helpline is operational each day from 9am to 5pm, Monday to Friday, for centres with queries in relation to Summer 2021.</p> <p>All other queries should be directed to <a href="mailto:centresupport@ccea.org.uk">centresupport@ccea.org.uk</a></p>
CCEA Entries	<a href="mailto:entriesandresults@ccea.org.uk">entriesandresults@ccea.org.uk</a>
Subject Officer	<p>Judith Ryan</p> <p><a href="mailto:jryan@ccea.org.uk">jryan@ccea.org.uk</a></p>
Specification Support Officer	<p>Nuala Tierney</p> <p><a href="mailto:ntierney@ccea.org.uk">ntierney@ccea.org.uk</a></p>

## Appendix 1

### AS Grade Descriptions and Key Features:

Assessment Objective	AO1		
Grade Descriptions	A	C	E
	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate specific knowledge and understanding of the working characteristics of materials, components and their uses and/or systems and control.</li> <li>develop an appropriate brief and specification.</li> <li>understand quality issues.</li> <li>use correct technical language relevant to the task.</li> <li>research and communicate a broad range of ideas and information effectively in a creative and innovative way through some recognition of values, issues or uniqueness (for the candidate) or connections with other ideas.</li> <li>demonstrate that they understand the main features of industrial and commercial practices related to manufacturing systems, including the use of ICT and stages of production;</li> <li>show that they understand health and safety issues through the regulatory and legislative framework;</li> <li>demonstrate clear strategies for testing and evaluating by taking into account form and function of a product, trends</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate a good level of knowledge and understanding of the working characteristics of materials, components, and their uses and/or systems and control.</li> <li>develop a satisfactory brief and specification.</li> <li>understand some quality issues.</li> <li>use some correct technical language relevant to the task.</li> <li>research and communicate a range of ideas and information effectively in a creative and innovative way through some recognition of values, issues, or uniqueness (for the candidate) or connections with other ideas.</li> <li>demonstrate that they understand some features of industrial and commercial practices related to manufacturing systems, including the use of ICT and stages of production.</li> <li>show that they understand some health and safety issues through the regulatory and legislative framework.</li> <li>demonstrate some strategies for testing and evaluating by considering form and function of a product, trends and styles of products reflecting environmental,</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate some understanding of how their knowledge and understanding of materials, components and their uses meet general design criteria;</li> <li>develop an outline brief and specification;</li> <li>communicate ideas and information appropriately;</li> <li>demonstrate that they understand at least one feature of industrial and commercial practices, a relevant manufacturing system and some stages of production; and</li> <li>demonstrate some strategies for testing and evaluating by taking into account form and function of a product and the need for appropriate modifications.</li> </ul>

	<p>and styles of products reflecting environmental, cultural and ethical or moral issues as well as stylistic and engineering considerations; and</p> <ul style="list-style-type: none"> <li>analyse and assess information and ideas in appropriate ways, including ICT, enabling others to interpret them.</li> </ul>	<p>cultural and ethical or moral issues as well as stylistic and engineering considerations.</p> <ul style="list-style-type: none"> <li>analyse and assess information and ideas in some appropriate ways, including ICT and enabling others to interpret them.</li> </ul>	
<b>AO1 Evidence</b>	<b>Grade A Key Features</b>	<b>Grade C Key Features</b>	<b>Grade E Key Features</b>
<p>Evidence may be found in the following areas:</p> <p>CCEA 2021 Assessment resources AS 1.</p> <p>Specimen Assessment Materials.</p> <p>AS Technology and Design: Past Papers and Mark Schemes.</p> <p>Questions/tasks requiring recall of knowledge e.g.: short-answer responses.</p> <p>AS 2: Coursework material.</p>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate specific knowledge and understanding of the working characteristics of materials, components and their uses and/or systems and control.</li> <li>develop an appropriate brief and specification.</li> <li>understand quality issues.</li> <li>use correct technical language relevant to the task.</li> <li>research and communicate a broad range of ideas and information effectively in a creative and innovative way through some recognition of values, issues or uniqueness (for the candidate) or connections with other ideas.</li> <li>demonstrate that they understand the main features of industrial and commercial practices related to manufacturing systems, including the use of ICT and stages of production;</li> <li>show that they understand health and safety issues through the regulatory and legislative framework;</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate a good level of knowledge and understanding of the working characteristics of materials, components, and their uses and/or systems and control.</li> <li>develop a satisfactory brief and specification.</li> <li>understand some quality issues.</li> <li>use some correct technical language relevant to the task.</li> <li>research and communicate a range of ideas and information effectively in a creative and innovative way through some recognition of values, issues, or uniqueness (for the candidate) or connections with other ideas.</li> <li>demonstrate that they understand some features of industrial and commercial practices related to manufacturing systems, including the use of ICT and stages of production.</li> <li>show that they understand some health and safety issues through the regulatory and legislative framework.</li> <li>demonstrate some strategies for testing and evaluating by considering form and</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>demonstrate some understanding of how their knowledge and understanding of materials, components and their uses meet general design criteria;</li> <li>develop an outline brief and specification;</li> <li>communicate ideas and information appropriately;</li> <li>demonstrate that they understand at least one feature of industrial and commercial practices, a relevant manufacturing system and some stages of production; and</li> <li>demonstrate some strategies for testing and evaluating by taking into account form and function of a product and the need for appropriate modifications.</li> </ul>

	<ul style="list-style-type: none"><li>• demonstrate clear strategies for testing and evaluating by taking into account form and function of a product, trends and styles of products reflecting environmental, cultural and ethical or moral issues as well as stylistic and engineering considerations; and</li><li>• analyse and assess information and ideas in appropriate ways, including ICT, enabling others to interpret them.</li></ul>	<p>function of a product, trends and styles of products reflecting environmental, cultural and ethical or moral issues as well as stylistic and engineering considerations.</p> <ul style="list-style-type: none"><li>• analyse and assess information and ideas in some appropriate ways, including ICT and enabling others to interpret them.</li></ul>	
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Assessment Objective	AO2		
Grade Descriptions	A	C	E
	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• apply skills that demonstrate understanding of the working characteristics and potential application of a range of materials, components and/or systems and control, including preparation and processing;</li> <li>• demonstrate that they understand the principles of testing materials and/or components;</li> <li>• demonstrate that they understand and can carry out appropriate making processes during product development or manufacture;</li> <li>• understand and use safe working practices;</li> <li>• use appropriate skills to develop a practical outcome;</li> <li>• communicate ideas and outcomes;</li> <li>• refine and/or modify products and/or manufacturing methods;</li> <li>• use a range of criteria, for example social, economic, environmental, cultural and ethical or moral considerations; and</li> <li>• demonstrate clear strategies for testing and evaluating by analysing the planning, production and manufacturing methods.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• apply some skills that demonstrate understanding of the working characteristics and potential application of some materials, components and/or systems and control, including preparation and processing.</li> <li>• demonstrate that the candidate understands some principles of testing materials and/or components.</li> <li>• demonstrate that the candidate understands and can carry out some appropriate making processes during product development or manufacture.</li> <li>• understand and use some safe working practices.</li> <li>• use some appropriate skills to develop a practical outcome.</li> <li>• communicate ideas and outcomes.</li> <li>• some refinement of products and/or manufacturing methods.</li> <li>• consider a range of criteria, for example social, economic, environmental, cultural, and ethical or moral considerations.</li> <li>• demonstrate -strategies for testing and evaluating by analysing the planning, production and manufacturing methods.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate that they understand the application of a limited range of materials and components, including their uses;</li> <li>• demonstrate some knowledge of testing a material or component;</li> <li>• demonstrate that they understand and can carry out a limited range of making processes safely during product development;</li> <li>• demonstrate that they understand how to plan for production;</li> <li>• communicate ideas and outcomes through a suitable development process and manufacturing method; and</li> <li>• demonstrate the ability to test and evaluate a limited range of manufacturing methods.</li> </ul>

AO2 Evidence	Grade A Key Features	Grade C Key Features	Grade E Key Features
<p>Evidence may be found in the following areas:</p> <p>CCEA 2021 Assessment resources Unit AS 1</p> <p>Specimen Assessment Materials.</p> <p>AS Technology and Design: Past Papers and Mark Schemes.</p> <p>Questions/ tasks requiring application of knowledge and skills e.g.: explain and discuss type questions, design-based questions, and evaluative type questions. AS 2: Coursework material.</p>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• apply skills that demonstrate understanding of the working characteristics and potential application of a range of materials, components and/or systems and control, including preparation and processing;</li> <li>• demonstrate that they understand the principles of testing materials and/or components;</li> <li>• demonstrate that they understand and can carry out appropriate making processes during product development or manufacture;</li> <li>• understand and use safe working practices;</li> <li>• use appropriate skills to develop a practical outcome;</li> <li>• communicate ideas and outcomes;</li> <li>• refine and/or modify products and/or manufacturing methods;</li> <li>• use a range of criteria, for example social, economic, environmental, cultural and ethical or moral considerations; and</li> <li>• demonstrate clear strategies for testing and evaluating by analysing the planning, production and manufacturing methods.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• apply some skills that demonstrate understanding of the working characteristics and potential application of some materials, components and/or systems and control, including preparation and processing.</li> <li>• demonstrate that the candidate understands some principles of testing materials and/or components.</li> <li>• demonstrate that the candidate understands and can carry out some appropriate making processes during product development or manufacture.</li> <li>• understand and use some safe working practices.</li> <li>• use some appropriate skills to develop a practical outcome.</li> <li>• communicate ideas and outcomes.</li> <li>• some refinement of products and/or manufacturing methods.</li> <li>• consider a range of criteria, for example social, economic, environmental, cultural, and ethical or moral considerations.</li> <li>• demonstrate -strategies for testing and evaluating by analysing the planning, production and manufacturing methods.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate that they understand the application of a limited range of materials and components, including their uses;</li> <li>• demonstrate some knowledge of testing a material or component;</li> <li>• demonstrate that they understand and can carry out a limited range of making processes safely during product development;</li> <li>• demonstrate that they understand how to plan for production;</li> <li>• communicate ideas and outcomes through a suitable development process and manufacturing method; and</li> <li>• demonstrate the ability to test and evaluate a limited range of manufacturing methods.</li> </ul>

## Appendix 2

### A2 Grade Descriptions and Key Features:

Assessment Objective	A01		
<b>Grade Descriptions</b>	A	C	E
	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate specific ability to analyse questions and/or contexts and select and explain relevant ways to proceed during in-depth study;</li> <li>• take account of a wide range of factors and show knowledge and understanding of materials and manufacturing processes;</li> <li>• combine distinct elements of technical information in their responses;</li> <li>• develop an initial design brief and an outline specification and produce a design for manufacturing, considering maintenance and product life;</li> <li>• clarify the task during the designing and making activities, identifying a wide range of user needs;</li> <li>• carry out in-depth research, including some relevant primary research;</li> <li>• originate a range of ideas and possible solutions when generating and developing proposals;</li> <li>• apply knowledge and understanding to develop and refine their solutions, demonstrating evidence of creativity and innovation through recognition of values, issues or uniqueness (for the</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate some ability to analyse questions and/or contexts and select and explain relevant ways to proceed during in-depth study.</li> <li>• take account of a range of factors and show knowledge and understanding of materials and manufacturing processes.</li> <li>• include elements of technical information in the candidate's responses.</li> <li>• develop an initial design brief, an outline specification and</li> <li>• produce a design for manufacturing with some consideration to maintenance and product life.</li> <li>• clarify the task during the designing or making activities,</li> <li>• identifying a range of user needs.</li> <li>• carry out good research, including some primary research.</li> <li>• originate some ideas and possible solutions when generating and developing proposals.</li> <li>• apply knowledge and understanding to develop and refine the candidate's solution, demonstrating some evidence of creativity and innovation.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate their ability to analyse questions and/or contexts and record some relevant information during in-depth study;</li> <li>• take account of a limited range of factors;</li> <li>• take account of requirements and demonstrate some knowledge and understanding of manufacturing processes during product analysis;</li> <li>• develop a design brief and specification;</li> <li>• use technical language relevant to the task;</li> <li>• clarify the task, identifying user needs;</li> <li>• carry out research during designing and making activities;</li> <li>• generate ideas based on their own knowledge and understanding, satisfying most of the specification criteria;</li> <li>• show awareness of manufacturing processes;</li> <li>• develop their proposals and model at least one aspect;</li> </ul>

	<p>candidate) or connections with other ideas;</p> <ul style="list-style-type: none"> <li>• research, analyse and communicate a broad range of ideas and information effectively;</li> <li>• use technical language fluently, draw appropriate conclusions and model aspects of their ideas when developing proposals;</li> <li>• demonstrate clear strategies for testing and evaluating by taking into account:             <ul style="list-style-type: none"> <li>– the working characteristics of materials and components;</li> <li>– the products' impact on society;</li> </ul>             and             <ul style="list-style-type: none"> <li>– the precise requirements of the brief or specification; and</li> </ul> </li> <li>• confidently analyse ideas and outcomes and draw highly appropriate conclusions, enhancing interpretation by others.</li> </ul>	<ul style="list-style-type: none"> <li>• research, analyse and communicate a range of ideas and information effectively.</li> <li>• use technical language, draw appropriate conclusions and model aspects of their ideas when developing proposals.</li> <li>• demonstrate strategies for testing and evaluating by considering some of:             <ul style="list-style-type: none"> <li>– the working characteristics of materials and components;</li> <li>– the products' impact on society; and the precise requirements of the brief or specification</li> </ul> </li> <li>• analyse ideas and outcomes and draw appropriate conclusions.</li> </ul>	<ul style="list-style-type: none"> <li>• indicate at least one working characteristic of a material or component;</li> <li>• demonstrate some strategies for testing and evaluating that refer to products and the need for modifications; and</li> <li>• evaluate ideas and outcomes in an appropriate way, including ICT, and draw conclusions enabling others to understand them.</li> </ul>
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AO1 Evidence	Grade A Key Features	Grade C Key Features	Grade E Key Features
<p>CCEA 2021 Assessment resources A2 1.</p> <p>Specimen Assessment Materials.</p> <p>A2 Technology and Design: Past Papers and Mark Schemes.</p> <p>Questions/tasks requiring recall of knowledge e.g.: short-answer responses.</p> <p>A2 2: Coursework material.</p>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate specific ability to analyse questions and/or contexts and select and explain relevant ways to proceed during in-depth study;</li> <li>• take account of a wide range of factors and show knowledge and understanding of materials and manufacturing processes;</li> <li>• combine distinct elements of technical information in their responses;</li> <li>• develop an initial design brief and an outline specification and produce a design for manufacturing, considering maintenance and product life;</li> <li>• clarify the task during the designing and making activities, identifying a wide range of user needs;</li> <li>• carry out in-depth research, including some relevant primary research;</li> <li>• originate a range of ideas and possible solutions when generating and developing proposals;</li> <li>• apply knowledge and understanding to develop and refine their solutions, demonstrating evidence of creativity and innovation through recognition of values, issues or uniqueness (for the candidate) or connections with other ideas;</li> <li>• research, analyse and communicate a broad range of ideas and information effectively;</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate some ability to analyse questions and/or contexts and select and explain relevant ways to proceed during in-depth study.</li> <li>• take account of a range of factors and show knowledge and understanding of materials and manufacturing processes.</li> <li>• include elements of technical information in the candidate's responses.</li> <li>• develop an initial design brief, an outline specification and produce a design for manufacturing with some consideration to maintenance and product life.</li> <li>• clarify the task during the designing or making activities,</li> <li>• identifying a range of user needs.</li> <li>• carry out good research, including some primary research.</li> <li>• originate some ideas and possible solutions when generating and developing proposals.</li> <li>• apply knowledge and understanding to develop and refine the candidate's solution, demonstrating some evidence of creativity and innovation.</li> <li>• research, analyse and communicate a range of ideas and information effectively.</li> <li>• use technical language, draw appropriate conclusions and model aspects of their ideas when developing proposals.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate their ability to analyse questions and/or contexts and record some relevant information during in-depth study;</li> <li>• take account of a limited range of factors;</li> <li>• take account of requirements and demonstrate some knowledge and understanding of manufacturing processes during product analysis;</li> <li>• develop a design brief and specification;</li> <li>• use technical language relevant to the task;</li> <li>• clarify the task, identifying user needs;</li> <li>• carry out research during designing and making activities;</li> <li>• generate ideas based on their own knowledge and understanding, satisfying most of the specification criteria;</li> <li>• show awareness of manufacturing processes;</li> <li>• develop their proposals and model at least one aspect;</li> <li>• indicate at least one working characteristic of a material or component;</li> <li>• demonstrate some strategies for testing and evaluating that refer to products and the need for modifications; and</li> </ul>

	<ul style="list-style-type: none"> <li>• use technical language fluently, draw appropriate conclusions and model aspects of their ideas when developing proposals;</li> <li>• demonstrate clear strategies for testing and evaluating by taking into account:             <ul style="list-style-type: none"> <li>– the working characteristics of materials and components;</li> <li>– the products' impact on society; and</li> <li>– the precise requirements of the brief or specification; and</li> </ul> </li> <li>• confidently analyse ideas and outcomes and draw highly appropriate conclusions, enhancing interpretation by others.</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrate strategies for testing and evaluating by considering some of:             <ul style="list-style-type: none"> <li>– the working characteristics of materials and components;</li> <li>– the products' impact on society; and</li> </ul> </li> <li>• the precise requirements of the brief or specification</li> <li>• analyse ideas and outcomes and draw appropriate conclusions</li> </ul>	<ul style="list-style-type: none"> <li>• evaluate ideas and outcomes in an appropriate way, including ICT, and draw conclusions enabling others to understand them.</li> </ul>
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Assessment Objective	AO2		
	A	C	E
<p style="text-align: center;"><b>Grade Descriptions</b></p>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate their understanding of systems and control and/or products and applications by discriminating between aspects of a system or product that perform and those that could be improved after in-depth study;</li> <li>• demonstrate an understanding of reliable and quantifiable performances of a range of materials, components and production processes;</li> <li>• demonstrate applied knowledge of the working properties and functions of materials and components;</li> <li>• work safely, accurately and skilfully with materials, components, tools and processes, including appropriate technologies to create high-quality products that match the specification;</li> <li>• plan, demonstrating an awareness of industrial methods and approaches during designing and making activities;</li> <li>• select an appropriate range of tools and equipment and plan processes;</li> <li>• manage time by anticipating potential problems and responding to changing circumstances;</li> <li>• determine the degree of accuracy required for products to function as intended, and apply relevant external standards to their task;</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate some understanding of systems and control and/or products and applications by discriminating between aspects of a system or product that perform and those that could be improved after in-depth study.</li> <li>• demonstrate some understanding of reliable and quantifiable performances of a range of materials, components and production processes.</li> <li>• demonstrate some applied knowledge of the working properties and functions of materials and components.</li> <li>• work safely and accurately with materials, components, tools and processes, including appropriate technologies to create good quality products that match the specification.</li> <li>• plan and demonstrate an awareness of industrial methods and approaches during designing and/or making activities.</li> <li>• select mostly an appropriate range of tools and equipment and plan processes.</li> <li>• manage time with some consideration of potential problems and some response to changing circumstances.</li> <li>• determine the accuracy required for products to function as intended.</li> <li>• test the performance of the candidate's product against some criteria and act on their findings by modifying some of their proposals if appropriate.</li> </ul>	<p>Candidates characteristically:</p> <ul style="list-style-type: none"> <li>• demonstrate a basic understanding of systems and control and/or products and applications during in-depth study;</li> <li>• demonstrate some understanding of a limited range of materials, components and production processes;</li> <li>• work safely with materials and components to create a product that meets their specification;</li> <li>• plan, demonstrating some awareness of industrial methods, during making activities;</li> <li>• select some appropriate tools and resources;</li> <li>• carry out at least one test of their product;</li> <li>• work to an outline plan;</li> <li>• use ICT appropriately for communicating, modelling, data handling, controlling or manufacture;</li> <li>• demonstrate strategies for testing and evaluating;</li> <li>• analyse information; and</li> <li>• assess the extent to which the product meets its specification.</li> </ul>

	<ul style="list-style-type: none"> <li>test the performance of their product against specified criteria and act on their findings by modifying their proposals if appropriate;</li> <li>communicate ideas and outcomes using ICT appropriately for communicating, modelling, data handling, controlling or manufacture;</li> <li>work to devised plans and seek agreement on realistic deadlines;</li> <li>take account of the relationship between material, form and manufacturing processes; and</li> <li>demonstrate clear strategies for evaluating, by:                             <ul style="list-style-type: none"> <li>analysing information critically and objectively;</li> <li>assessing the extent to which their work will meet genuine needs; and</li> <li>devising quality assurance procedures and reviewing the way the work plan is followed using external sources for evaluating products.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>communicate with some limitations ideas and outcomes using ICT appropriately for communicating, modelling, data handling, controlling or manufacture.</li> <li>work to a plan which sets some realistic deadlines.</li> <li>take some account of the relationship between material, form and manufacturing processes.</li> <li>demonstrate strategies for evaluating, by:                             <ul style="list-style-type: none"> <li>analysing information objectively.</li> <li>assessing the extent to which their work will meet needs.</li> <li>devising some quality assurance procedures and reviewing the way the work plan is followed using some external sources for evaluating products.</li> </ul> </li> </ul>	
<b>AO2 Evidence</b>	<b>Grade A Key Features</b>	<b>Grade C Key Features</b>	<b>Grade E Key Features</b>
CCEA 2021 Assessment resources Unit A2 1  Specimen Assessment Materials.  A2 Technology and Design: Past	Candidates characteristically: <ul style="list-style-type: none"> <li>demonstrate their understanding of systems and control and/or products and applications by discriminating between aspects of a system or product that perform and those that could be improved after in-depth study;</li> <li>demonstrate an understanding of reliable and quantifiable performances</li> </ul>	Candidates characteristically: <ul style="list-style-type: none"> <li>demonstrate some understanding of systems and control and/or products and applications by discriminating between aspects of a system or product that perform and those that could be improved after in-depth study.</li> <li>demonstrate some understanding of reliable and quantifiable performances of a range of materials,</li> </ul>	Candidates characteristically: <ul style="list-style-type: none"> <li>demonstrate a basic understanding of systems and control and/or products and applications during in-depth study;</li> <li>demonstrate some understanding of a limited range of materials, components and production processes;</li> <li>work safely with materials and components to create a product that meets their specification;</li> </ul>

<p>Papers and Mark Schemes.</p> <p>Questions/tasks requiring application of knowledge and skills e.g.: explain and discuss type questions, design-based questions, and evaluative type questions.</p> <p>A2 2: Coursework material.</p>	<p>of a range of materials, components and production processes;</p> <ul style="list-style-type: none"> <li>• demonstrate applied knowledge of the working properties and functions of materials and components;</li> <li>• work safely, accurately and skilfully with materials, components, tools and processes, including appropriate technologies to create high-quality products that match the specification;</li> <li>• plan, demonstrating an awareness of industrial methods and approaches during designing and making activities;</li> <li>• select an appropriate range of tools and equipment and plan processes;</li> <li>• manage time by anticipating potential problems and responding to changing circumstances;</li> <li>• determine the degree of accuracy required for products to function as intended, and apply relevant external standards to their task;</li> <li>• test the performance of their product against specified criteria and act on their findings by modifying their proposals if appropriate;</li> <li>• communicate ideas and outcomes using ICT appropriately for communicating, modelling, data handling, controlling or manufacture;</li> <li>• work to devised plans and seek agreement on realistic deadlines;</li> <li>• take account of the relationship between material, form and manufacturing processes; and</li> </ul>	<p>components and production processes.</p> <ul style="list-style-type: none"> <li>• demonstrate some applied knowledge of the working properties and functions of materials and components.</li> <li>• work safely and accurately with materials, components, tools and processes, including appropriate technologies to create good quality products that match the specification.</li> <li>• plan and demonstrate an awareness of industrial methods and approaches during designing and/or making activities.</li> <li>• select mostly an appropriate range of tools and equipment and plan processes.</li> <li>• manage time with some consideration of potential problems and some response to changing circumstances.</li> <li>• determine the accuracy required for products to function as intended.</li> <li>• test the performance of the candidate's product against some criteria and act on their findings by modifying some of their proposals if appropriate.</li> <li>• communicate with some limitations ideas and outcomes using ICT appropriately for communicating, modelling, data handling, controlling or manufacture.</li> <li>• work to a plan which sets some realistic deadlines.</li> <li>• take some account of the relationship between material, form and manufacturing processes.</li> </ul>	<ul style="list-style-type: none"> <li>• plan, demonstrating some awareness of industrial methods, during making activities;</li> <li>• select some appropriate tools and resources;</li> <li>• carry out at least one test of their product;</li> <li>• work to an outline plan;</li> <li>• use ICT appropriately for communicating, modelling, data handling, controlling or manufacture;</li> <li>• demonstrate strategies for testing and evaluating;</li> <li>• analyse information; and</li> <li>• assess the extent to which the product meets its specification.</li> </ul>
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	<ul style="list-style-type: none"><li>• demonstrate clear strategies for evaluating, by:<ul style="list-style-type: none"><li>– analysing information critically and objectively;</li><li>– assessing the extent to which their work will meet genuine needs; and</li><li>– devising quality assurance procedures and reviewing the way the work plan is followed using external sources for evaluating products.</li></ul></li></ul>	<ul style="list-style-type: none"><li>• demonstrate strategies for evaluating, by:<ul style="list-style-type: none"><li>– analysing information objectively.</li><li>– assessing the extent to which their work will meet needs.</li><li>– devising some quality assurance procedures and reviewing the way the work plan is followed using some external sources for evaluating products.</li></ul></li></ul>	
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## Appendix 3

### 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.

<b>High</b>	<p>The use of resources is tightly prescribed. The centre must ensure that:</p> <ul style="list-style-type: none"> <li>• all students are within direct sight of the teacher/supervisor throughout the session(s);</li> <li>• display materials which might provide assistance are removed or covered;</li> <li>• there is no access to email, the internet or mobile phones;</li> <li>• students complete their work independently;</li> <li>• interaction with other students does not occur; and</li> <li>• no assistance of any description is provided.</li> </ul>
<b>Medium</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• there is sufficient evidence to ensure that the individual work can be authenticated; and</li> <li>• the work an individual student submits for assessment is their own.</li> </ul> <p>If work has been completed in groups, teachers must ensure that they can determine and assess the individual student's contribution to the work.</p> <p>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.</p>
<b>Limited</b>	<p>Work is completed without any direct supervision and would not normally contribute to assessable outcomes.</p>





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