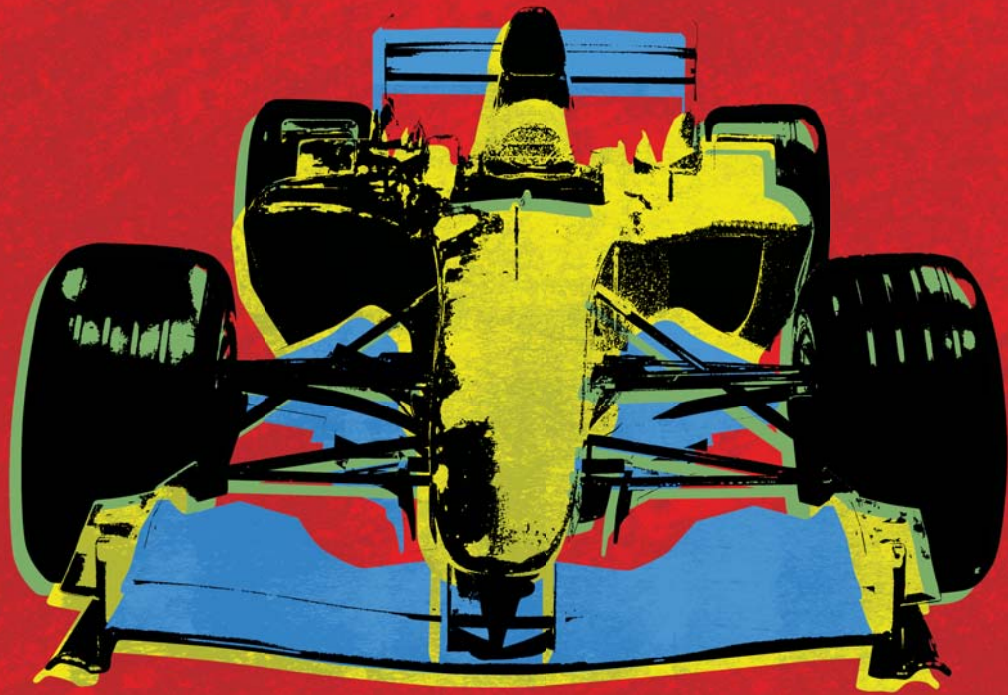


Edexcel GCSE Engineering Controlled Assessment Teacher Support Book



Welcome to the GCSE 2009 Controlled Assessment Teacher Support Book

This Teacher Support Book has been designed to provide you with the answers to key questions that will arise during the teaching and assessment of Controlled Assessment GCSE Engineering 2EG02.

The book is divided into three sections. It contains content which is applicable for all options and some content which is specific to your chosen option.

Inside you will find some fantastic content, including:

- An introduction to Controlled Assessment
- The range of activities for the units
- A detailed overview of Expected Evidence

Expert advice from the people who know

We hope you find this document useful and look forward to working with you on our new GCSE specifications. We are on hand to answer your questions so please feel free to get in touch.



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We look forward to working with you.

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Unit 1 5EG01 Engineering Design and Graphical Communication

Unit 2 5EG02 Engineered Products

LEVELS OF CONTROL IN CONTROLLED ASSESSMENT

The specification for this qualification states that controlled assessment is required for both Unit 1 and Unit 2 and that three levels of control are set: for task setting, for task taking and for task marking.

Task setting is set at high level of control. The Controlled Assessment Tasks written by Edexcel for these units have been devised to provide this high level of control, whilst still allowing centres to contextualise the work set to meet local needs and to use the resources available to the centre.

Task taking is set at medium level of control and it is these controlled conditions in which students perform these tasks that are the main focus of this Centre Guidance.

Task marking is also set at medium level of control. Marking of the tasks will be carried out by centre teachers and moderated by Edexcel. This guidance booklet will explain the task marking stage by identifying the expected evidence produced for the mark ranges. It will also explain to centre what to look for when marking the student work against the assessment criteria.

CONTROLLED ASSESSMENT - CONTROLLED CONDITIONS FOR TASK-TAKING

Controlled assessment refers to the production of the evidence requirements for Unit 1 and Unit 2 under controlled conditions. Controlled assessment is a supervised period of approximately 23 - 33 hours for each unit, during which time the student produces the portfolio and product evidence that will be assessed. Controlled assessment is designed for the production and assessment of portfolio work and needs to be separated from the teaching and learning process.

A current Centre Assessment Policy might need to be developed on the basis of this Guidance in order to incorporate controlled assessment requirements and procedures.

The teaching and learning processes necessary to prepare the student for the task taking period of controlled assessment will need to be designed for, and delivered, before the controlled assessment period. Centre staff will not wish to use the time constraints of controlled assessment to undertake tutoring and tuition. The purpose of controlled assessment is to provide opportunity for the student to apply the skills and knowledge already learned, to the tasks contained in the Controlled Assessment Task provided for each unit, in the time period allocated.

Student work for portfolios and products can be produced only during lesson time when supervised. Student work must be collected in at the end of each controlled assessment lesson and handed back out at the beginning of the next controlled assessment lesson.

A feature of Unit 1 of the new GCSE 2009 qualification is criterion e) 'Interpreting engineering drawings and circuit diagrams'. This criterion is separately assessed by a specific task found in the Controlled Assessment Task for and needs to be completed during a controlled assessment lesson under supervision. The evidence expected for the different mark ranges available is explained below.

Preparatory or developmental research, note-making, draft ideas and planning ideas, all might be undertaken away from the controlled conditions and can be made use of during the controlled task taking lessons. The designated 23 - 33 hours of controlled assessment for each unit should be viewed as the time-constrained opportunity to convert preparatory work to a final portfolio version and to undertake, and provide evidence of, the various practical tasks required by both units.

The use of centre-prepared pro-formas for completion by students for various tasks is well developed for this qualification and this practice may be continued. Centres may note that the layout of pro-formas can limit students to the production of 'basic' identification evidence. Candidates need to be encouraged to provide descriptions and explanations in order to access the higher marks. This will probably be in the form of evidence which is extra to that provided through the use of pro-formas.

THE ROLE OF TEACHERS DURING CONTROLLED ASSESSMENT

During the controlled assessment periods the role of the teacher is an important one:

- to provide supervision of the controlled assessment conditions
- to provide supervision of safe systems of working and of health and safety in general
- to observe and record individual student performance, to inform their own marking of student evidence against the criteria, and the witness statement they will need to make
- to provide, and to be able to comment upon, the levels of 'support and guidance' given to individual students for Unit 2, informing their marking decisions for the criteria for this unit
- to be able to confirm that the portfolio and product work presented was completed within the designated 23 - 33 hours
- to be able to authenticate the student work
- to provide formative feedback (see page 7)
- to supervise the controlled assessment activity for criterion e).

FORMATIVE FEEDBACK DURING CONTROLLED ASSESSMENT

Teachers may provide regular formative feedback during controlled assessment. This might take the form of:

- indicating what is missing in student work reviewed, pointing out what has not been evidenced
- indicating what is insufficient in the student work
- a discussion directly comparing work at a given stage with the requirements of the criteria, by indicating what is evidenced, and what is not
- a review with the student of actual progress made, against planned progress within the controlled assessment period (possibly by indicating where time has been lost and how to focus on the parts which could generate the best benefit in the time remaining)
- comments on the quality of written communication provided and the level of marks likely to be obtained for this aspect of the assessment, where appropriate, perhaps suggesting spell/grammar checks

It should also be noted that any amendment or development of the student work that is identified during this formative feedback needs also to be undertaken during the controlled assessment period. Centres will need to point out at an early stage that further work to address criteria requirements to 'describe' and 'justify', for higher marks, will be done in the designated controlled period. (The portfolio work will not be taken away and re-worked outside the controlled conditions).

Having undertaken the planned and controlled assessment activity for Unit 1 criterion e), it is not expected that further time will be allocated to improving answers to this activity after feedback from the teacher.

The evidence produced for Unit 1 criterion e) should be included in the student portfolio for Unit 1 (Unit code: 5EG01) in the form of an annexe to the main evidence produced for the design activity.

Section 2: Range of Activities

CONTROLLED ASSESSMENT -

THE RANGE OF ACTIVITIES FOR THE UNITS

The specifications and assessment criteria for Unit 1 and Unit 2 also indicate the ranges of tasks that need to be completed during controlled assessment. These are shown in the table below:

Unit 1	Unit 2
Produce an analysis of the brief*	Read and interpret specification and drawings
Produce a design specification*	Produce a production plan - resources and processes*
Produce design ideas*	Produce a production plan - production and constraints*
Testing to select final solution to be developed*	Use materials
Interpreting engineering drawings and circuit diagrams	Use parts and components
Use engineering drawing techniques	Use processes, tools and equipment
Produce engineering drawings to standard	Produce the product
Present final solution with modifications*	Test and evaluate the product*

* Opportunity to be assessed on quality of written communication

The evidence of all these activities needs to be produced during the controlled assessment period so that centre staff will need to allocate appropriate times to each, so that 23 - 33 hours are used in total. Some guidance on suggested times is provided in the Sample Assessment Materials publication produced by Edexcel for GCSE in Engineering. It can be seen there that more than a half of the suggested time for each unit is allocated to the practical activities of 'graphical communication' (Unit 1) and 'making the product' (Unit 2) and to the presentation of the evidence for these activities.

For Unit 1, it follows that only a third or so of the time allocated for the controlled assessment period is allocated to analysis, development of design ideas, selection between the design ideas, and presentation and modification of the final design, including time for gathering and writing the evidence of these activities in final portfolio form. For Unit 2, a similar period is available to be devoted to interpretation, planning, testing and evaluation and to the gathering and presentation of these activities in final portfolio form.

Section 2: Range of Activities

These portfolio-building activities can realistically be allocated only some 10 hours for each unit. Centres will therefore appreciate the need for appropriate teaching and learning to be delivered **before** the controlled assessment period, so that this period can be used to focus on the necessary activities and the follow-up to any formative feedback provided.

Details of the activities required for the assessment of Unit 1 and Unit 2 are described in the Controlled Assessment Tasks written by Edexcel for the Task Setting stage of Controlled Assessment and the evidence expected to be presented for each unit to satisfy the assessment requirements is detailed below.

The assessment of quality of written communication

Both Unit 1 and Unit 2 specifications include assessment criteria that make provision for credit being given for the quality of written communication used. The Controlled Assessment Tasks devised for controlled assessment for these units include this provision as required by the specification.

For both units, the student work required to address the standards required for higher credit for quality of written communication must also be done as part of the designated time of the controlled period.

Section 3: Assessment Information

UNIT 1: ENGINEERING DESIGN AND GRAPHICAL COMMUNICATION

a) Analysing the brief*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Analysis of the brief to identify basic client needs, with identification of some key features of the engineered product. The key features identified are briefly listed, make little use of correct grammar and include frequent spelling mistakes, with incorrect or inappropriate use of terminology.	Analysis of the brief to identify the main client needs, with a description of the key features of the engineering product. The description of key features includes a sound standard of spelling and punctuation. Terminology is mostly used appropriately.	Analysis of the brief to explain the main client needs, with a justification of the key features of the engineering product. The analysis makes good use of accurate terminology and grammar, and few punctuation and spelling errors.
<u>Expected Evidence</u> Identification of basic client needs and some key features. A brief listing of both. (2)	<u>Expected Evidence</u> Identification of main client needs (1) Description of key features (2) Sound spelling and terminology (1)	<u>Expected Evidence</u> Explanation of client needs (2) Justification of key features (2) Accurate terminology, grammar and punctuation (2)
<p>Client needs include: cost, quantity required, intended market, timescales and product function. Key features include: product performance, styling and aesthetics, size, quality standards. *Credit for quality of written communication is built into Expected Evidence requirements. Key features for a) and product criteria and production constraints for b) below may include similar evidence and obtain credit in both criteria.</p>		

b) Details of the design criteria and production constraints*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Production of a design specification that identifies the basic details of the product criteria and production constraints. Design specification makes little use of correct grammar and includes frequent spelling mistakes, with incorrect or inappropriate use of terminology.	Production of a design specification that describes some of the main details of the product criteria and production constraints. Details are presented using adequate standards of legibility, spelling and punctuation. Terminology is mostly used appropriately.	Production of a design specification that explains the main details of the product criteria and production constraints. Grammar, punctuation and few spelling errors and there is good use of accurate terminology.
<u>Expected Evidence</u> Simple statements/listing of product criteria (1) Simple statement/listing of production constraints (1)	<u>Expected Evidence</u> Well written description of some main details of the product criteria (2) Well written description of some main details of the production constraints (2)	<u>Expected Evidence</u> Well written explanation of the main details of the product criteria (3) Well written explanation of the main details of the production constraints (3)
<p>Product criteria include: product performance, intended markets, maintenance requirements, size Production constraints include: product regulations, cost, scale of production required, materials, quality standards, limitations of available machinery. *Credit for quality of written communication is built into Expected Evidence requirements. Key features for a) above and product criteria and production constraints for b) may include similar evidence and obtain credit in both criteria.</p>		

Section 3: Assessment Information

c) Ideas and design solutions*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Generation of basic design ideas and the development of simple design solutions. Ideas and solutions include frequent errors in spelling and grammar. Terminology is not used accurately or appropriately.	Generation of alternative design ideas and the development, in some detail, of design solutions. Ideas and solutions are presented using a sound standard of spelling and punctuation. Terminology is mostly used appropriately	Generation of imaginative design ideas and the development of detailed and appropriate design solutions. Few grammar, punctuation and spelling errors and there is good use of accurate terminology.
<u>Expected Evidence</u> 2 or 3 basic design ideas (1) Some development of at least one idea (1)	<u>Expected Evidence</u> 2 or 3 design ideas, one significantly different, appropriate terminology (2) Ideas developed to solutions in some detail, presented quite well (2)	<u>Expected Evidence</u> Imaginative and different design ideas, good and consistent presentation (3) Detailed, appropriate and well presented development of solutions (3)
<p>Note: design development might include some use of scientific principle and calculation to illustrate design validity Design ideas need to relate to engineering design of function, not focus on the 'product design' of form and aesthetics. *Credit for quality of written communication is built into Expected Evidence requirements.</p>		

d) Testing and selecting the final solution*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Present limited testing against some of the design criteria in order to select the final design solution. There is little evidence of why the final design idea was chosen. Written evidence is poorly presented with little use of the appropriate terminology	Present a range of testing against the design criteria in order to select the final design solution. Describe, in some detail, how the final design solution meets the main design criteria. Written evidence is generally free of spelling and grammatical errors and terminology is mostly used accurately and appropriately.	Present objective testing against the design criteria in order to select and justify the final solution. Written evidence is clear, with consistent use of spelling, punctuation and grammar and there is good use of accurate terminology.
<u>Expected Evidence</u> Simple testing by subjective scoring against criteria (a table) (1) Simple statement of selection of the single design solution (1)	<u>Expected Evidence</u> A range of testing approaches used (2) Use of a range of testing to select final solution and describe in some detail how solution meets main criteria, presented accurately (2)	<u>Expected Evidence</u> A range of objective tests used (3) Use of this objective testing to select and justify detailed final solution, presented with consistent accuracy (3)
<p>Simple testing may be subjective scoring of the design ideas against some of the design criteria. A range of testing should include a number of different tests e.g. models, different prototype circuit arrangements, mock-ups to check clearances, calculations to test load-bearing. Objective testing should employ appropriate testing of developed prototypes, using measurements on different variations in order to select and justify. Note: class questionnaires are not encouraged for this criterion - these can lead to solutions that lie outside the customer design brief. *Credit for quality of written communication is built into Expected Evidence requirements.</p>		

Section 3: Assessment Information

e) Interpreting engineering drawings and circuit diagrams

Mark range 1-2	Mark range 3-4	Mark range 5-6
Read engineering drawings and circuit diagrams and name the components/features.	Read and interpret engineering drawings and circuit diagrams and name and explain the function of some of the components/features.	Read and interpret engineering drawings and circuit diagrams and name and explain the function of each component/feature.
<u>Expected Evidence</u> Correct answers to question 1-5 (1) and to question 6 (1)	<u>Expected Evidence</u> As previous mark range (2) Explain the function of two components in question 7 (2)	<u>Expected Evidence</u> As previous mark range (4) Explain the function of remaining two components in question 7 (2)
<p>This criterion is assessed by a separate task detailed in the Controlled Assessment Task written for this Unit.</p> <p>The evidence produced for this criterion should be included in the student portfolio for Unit 1 in the form of an annexe to the main evidence produced for the design activity.</p>		

f) Selecting engineering drawing techniques

Mark range 1-2	Mark range 3-4	Mark range 5-6
Selection and use of a limited range of engineering drawing techniques to communicate some aspects of the final solution. The selection of drawing techniques takes some account of the purpose of the drawing.	Selection and use of a range of engineering drawing techniques to communicate, in some detail, the final solution. The selection of drawing techniques takes some account of the purpose of the drawing and the intended audience.	Selection and use of an effective range of engineering drawing techniques to communicate, in detail, the final solution. The selection of drawing techniques takes considered account of the purpose of the drawing and the intended audience.
<u>Expected Evidence</u> Selection of limited range of techniques with some account of purpose indicated (1) Use of a limited range of techniques with little detail communicated (1)	<u>Expected Evidence</u> Wider range of techniques selected with reference to purpose and intended audience (2) Wider range used to communicate some detail of the final solution (2).	<u>Expected Evidence</u> Widest range selected with considered account of purpose and intended audience (3) Widest range used effectively to communicate full detail of final solution (3)
<p>Note: the range of drawing techniques is identified as: freehand sketches, perspective drawings, block and flow diagrams, schematic diagrams, circuit diagrams, 1st/3rd angle orthographic projections, assembly diagrams and exploded diagrams.</p> <p>The widest range of drawings would include CAD techniques and exploded diagrams and are likely to use 3D CAD techniques.</p> <p>The types of audience listed in the specification are service engineers, manufacturing engineers and technical customers, although others may be included.</p>		

Section 3: Assessment Information

g) Producing engineering drawings

Mark range 1-2	Mark range 3-5	Mark range 6-8
Production of basic engineering drawings that show limited compliance with sector-specific standards and conventions. Drawings include the use of some relevant common standard symbols.	Production of engineering drawings that comply, in some detail, with sector-specific standards and conventions. Use of a range of relevant standard symbols for the named components.	Production of appropriate manual and CAD engineering drawings that comply with sector-specific standards and conventions.
<u>Expected Evidence</u> Basic engineering drawings with limited compliance (1). Some relevant common standard symbols (1).	<u>Expected Evidence</u> Manual or CAD engineering drawings that include detail of a range of parts and components, using sector-specific standards and conventions (3). A range of relevant standard symbols used for named components (2).	<u>Expected Evidence</u> Previous range of engineering drawings but in manual and CAD form that comply with sector-specific standards. (6) . CAD Assembly diagrams and exploded views included (2).
<p>Note: This criterion awards a greater amount of credit (8 marks) and is an opportunity to gain credit for drawing skills.</p> <p>Note: The range of engineering drawings for this criterion only includes: orthographic projection and circuit diagrams (electrical/electronic and/or pneumatic/hydraulic). Parts and components need to be included for higher mark ranges, which makes assembly drawings and exploded views appropriate for the highest score.</p> <p>The drawings assessed for this criterion g) will form part of the range of drawings presented for criterion f).</p> <p>Applicable drawing standards are listed in the Controlled Assessment Task for this unit and the common standard symbols and conventions referred to include: border, title block, dimensions, centre lines and electrical, electronic and mechanical features and components.</p>		

h) Presenting and modifying the final solution*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Limited description of how the final design solution meets the client design brief and design specification, identifying some relevant modifications. Written evidence is poorly presented with little use of appropriate terminology.	Description, in some detail, of how the final design solution meets the client brief and design specification, describing relevant modifications. Written evidence is generally free of errors and terminology mostly used appropriately	Detailed explanation of how the final design solution meets the brief and specification, explaining relevant modifications. Written evidence is clear, with few, if any spelling or punctuation mistakes and there is good use of accurate terminology.
<u>Expected Evidence</u> Portfolio serves as presentation document with limited description of how solution meets brief (1). Some modifications identified (1).	<u>Expected Evidence</u> Portfolio serves as presentation document and describes, in some detail and generally free of errors, how the final solution meets the brief (2). Relevant modifications are described using appropriate terminology (2).	<u>Expected Evidence</u> Detailed explanation provided in portfolio with high quality of presentation (3). Relevant modifications are explained clearly and accurately (3).
<p>Note: teacher/other can act in client role to receive portfolio (as design solution presentation document) and offer relevant modifications.</p> <p>For all mark ranges, candidates need to produce a separate description or detailed explanation of how the final solution meets the brief including detail of earlier modifications, adding these to the portfolio to form the presentation document for submission to client or proxy.</p> <p>Following presentation, which need not be a verbal one, the candidate needs to identify and describe/explain further modifications.</p> <p>* Credit for quality of written communication is built into Expected Evidence requirements.</p>		

Section 3: Assessment Information

UNIT 2: ENGINEERED PRODUCTS

a) Read and interpret a product specification and engineering drawings/diagrams

Mark range 1-2	Mark range 3-4	Mark range 5-6
With support and guidance, use of some information within a product specification and interpretation of basic details in engineering drawings and/or diagrams.	With limited support and guidance, use of the main information within a product specification and interpretation of the main details in engineering drawings and diagrams.	Independent and confident use of the main information within a product specification and competent interpretation of the main details in engineering drawings and diagrams.
<p><i>Expected Evidence</i></p> <p>Witness testimony to significant extent of support and guidance alongside portfolio evidence that:</p> <p>Shows use of some information (1)</p> <p>Limited interpretation of basic details (1)</p> <p>Both elements may be assessed across whole of unit.</p>	<p><i>Expected Evidence</i></p> <p>Witness testimony to limited support and guidance alongside portfolio evidence that shows:</p> <p>Use of main information (2)</p> <p>Interpretation of main details (2)</p> <p>Both elements may be assessed across whole of unit.</p>	<p><i>Expected Evidence</i></p> <p>Witness testimony to independence and portfolio shows:</p> <p>Confident use of the main information (3)</p> <p>Competent interpretation of the Main details (3)</p> <p>Both elements may be assessed across whole of unit.</p>
<p>Note: the student must receive a written product specification and all relevant engineering drawings necessary to make the product. The product specification should include all product details such as: dimensions, tolerances, fit, finish performance and quality, and these may be provided in part on suitable drawings. Engineering drawings supplied should conform to sector-specific standards and conventions. The provision of perspective views of parts and components may limit the students ability to achieve the highest level of mark for interpretation of drawings.</p> <p>Note that the witness testimony supports learner work on the criterion presented in the portfolio.</p> <p>Holistic evidence across the whole unit may be used for the assessment of this criterion; scores given here need to be coherent with those given at criteria b) c) g) h).</p> <p>This criterion is probably assessed at the portfolio completion stage, although it is important to record the provision of support and guidance at all stages.</p> <p>Note: the use of the word 'competent' in the highest mark range does require clear evidence across the unit of the use of skill to make a complete product.</p>		

Section 3: Assessment Information

b) Produce a production plan which includes information about resources and processing requirements*

Mark range 1-2	Mark range 3-4	Mark range 5-6
With support and guidance, produce a production plan that identifies basic details of resources and processing requirements. Production plan includes frequent errors in spelling and grammar. Terminology is not used accurately or appropriately.	With limited support and guidance, produce a production plan that identifies the most important details of resources and processing requirements. Production plan is legible and includes a sound use of spelling and punctuation. Terminology is mostly used appropriately.	Independently produce a production plan that identifies fully the main details of the resources and processing requirements. Grammar, punctuation and spelling errors are unusual and there is good use of accurate terminology.
<p><u>Expected Evidence</u></p> <p>Witness testimony to significant extent of support and guidance alongside a production plan showing:</p> <p>Basic details of resources (1) Basic details of processing requirements (1).</p>	<p><u>Expected Evidence</u></p> <p>Witness testimony to limited support and guidance alongside well presented production plan identifying the most important details:</p> <p>Of resources (2) Of processing requirements (2), using terminology that is mostly appropriate.</p>	<p><u>Expected Evidence</u></p> <p>Witness testimony to independent production of a production plan that uses high quality of written communication with few errors and accurate terminology and identifies fully:</p> <p>The main details of resources (3) The main details of processing requirements (3).</p>
<p>Note: resources include details of materials, parts, components, tools and equipment, including measuring equipment you will use at g) and h) and any assembly techniques required. Processing requirements need to be detailed in your plan; note that some of these details may be included as 'production requirements/details' for c) e.g. details of processes to be used: lathe turning, drilling, cutting, soldering, spot welding, inspection. The unit specification provides a listing of processes expected to be included: removal, shaping, joining, heat and chemical treatment, surface finishing. Higher marks are awarded if the production plan has detailed description/explanation enough to be followed by a third party. * Credit for quality of written communication is built into Expected Evidence requirements. Again, the witness testimony serves to support student work presented for the criterion.</p>		

Section 3: Assessment Information

c) Produce a production plan which includes information about production details and constraints*

Mark range 1-2	Mark range 3-4	Mark range 5-6
With support and guidance, produce a production plan that identifies basic details of production requirements and constraints. Production plan includes frequent errors in spelling and grammar. Terminology is not used accurately or appropriately.	With limited support and guidance, produce a production plan that identifies the most important production requirements and constraints. Production plan is legible and includes a sound use of spelling and punctuation. Terminology is mostly used appropriately.	Independently produce a production plan that identifies fully the main details of production requirements and constraints. Grammar, punctuation and spelling errors are unusual and there is good use of accurate terminology.
<u>Expected Evidence</u> Witness testimony to significant extent of support and guidance alongside a production plan showing: Basic details of production requirements (1). Basic details of production constraints (1).	<u>Expected Evidence</u> Witness testimony to limited support and guidance alongside well presented production plan identifying the most important details: Of production requirements (2). Of production constraints (2), using terminology that is mostly appropriate.	<u>Expected Evidence</u> Witness testimony to independent production of a production plan that uses high quality of written communication with few errors and accurate terminology and identifies fully: The main details of production requirements (3). The main details of production constraints (3)
<p>Note: production details/requirements include machine settings and speeds, tooling details, sequence of production, health and safety requirements for the process. Production constraints include quality control points (from the specification), deadlines, machine availability, inspection procedures, cost of materials and machine time. Again witness testimony supports student work as presented. * Credit for quality of written communication is built into Expected Evidence requirements.</p>		

d) Identify, prepare and use materials

Mark range 1-2	Mark range 3-4	Mark range 5-6
Identify and prepare, with guidance, some appropriate materials, using them safely with some skill to make a product.	Identify and prepare, with limited guidance, appropriate materials, using them safely with skill to make a product.	Identify and independently prepare appropriate materials, using them safely with skill and accuracy to make a product.
<u>Expected Evidence</u> Witness testimony to significant extent of guidance: To identify and prepare some appropriate materials (1) To use them safely with some skill to make the product (1)	<u>Expected Evidence</u> Witness testimony to limited guidance given: To identify and prepare appropriate materials (2) To use them safely with skill to make the product (2)	<u>Expected Evidence</u> Witness testimony to independent: Identification and preparation of appropriate materials (3) Use of materials safely with skill and accuracy to make the product (3)
<p>Note: Marks at the higher mark ranges should be coherent with those given for criteria f) g) and work short of completion of the product should be assessed to take account of this. The highest mark range scores for accuracy need to be coherent with scores given at criteria f) g). Note: materials are as stated in the given specification but correct choice of grade or condition from store can be rewarded.</p>		

Section 3: Assessment Information

e) Identify, prepare and use parts and components

Mark range 1-2	Mark range 3-4	Mark range 5-6
With guidance and support, identify and prepare some appropriate parts and components, using them safely with some skill to make a product.	With limited guidance and support, identify and prepare appropriate parts and components, using them safely with skill to make a product.	Independently identify and prepare appropriate parts and components, using them safely with skill and accuracy to make a product.
<u>Expected Evidence</u> Witness testimony to significant extent of guidance and support: To identify and prepare some appropriate parts and components (1) To use them safely with some skill to make the product (1)	<u>Expected Evidence</u> Witness testimony to limited guidance and support given: To identify and prepare appropriate parts and components (2) To use them safely with skill to make the product (2)	<u>Expected Evidence</u> Witness testimony to independent: Identification and preparation of appropriate parts and components (3) Use of appropriate parts and components safely with skill and accuracy to make the product (3)
<p>Note: Marks at the higher mark ranges should be coherent with those given for criteria f) g) and work short of full completion of the product should be assessed to take account of this.</p> <p>The highest mark range scores for accuracy need to be coherent with scores given at criteria f) g).</p> <p>Note: parts and components are to be 'bought-in' and as stated in the specification or identified through interpretation of given drawings. Identification can be from specification and catalogues and/or stock and preparation can be as necessary e.g. component legs, sets of nuts, bolts and washers.</p>		

f) Select and use processes, tools and equipment

Mark range 1-2	Mark range 3-5	Mark range 6-8
Select and use, with guidance, some appropriate processes, tools and equipment, using them safely, with guidance and support, and exhibiting some skill to make a product.	Select and use, with limited guidance, appropriate processes, tools and equipment, using them safely with limited guidance and skill to make a product.	Independently select appropriate processes, tools and equipment, using them safely with skill and accuracy to make a product.
<u>Expected Evidence</u> Witness testimony to extent of guidance given in the selection and use of appropriate processes, tools and equipment (1) Witness testimony to the amount of guidance and support given to use them safely with some skill to make the product (1)	<u>Expected Evidence</u> Witness testimony to limited guidance given in the selection and use of appropriate processes, tools and equipment (2) Witness testimony to the limited guidance given to use them safely with skill to make the product (3)	<u>Expected Evidence</u> Witness testimony to independent selection of appropriate processes, tools and equipment (3) Witness testimony to the safe use of processes, tools and equipment with skill and accuracy to make the product (5)
<p>Note: For each mark range, marks are available for the selection and use of the processes, tools and equipment, whether or not the product is completed. Further marks are available at each mark range for application of safe work, skill and accuracy and these marks should be coherent with those given at g). This coherence should include the case where marks given at g) are for an incomplete product and also include coherence with those marks given at g) for the use of measuring equipment to show skill and accuracy.</p> <p>At all points, witness testimony should be given in support and confirmation of learner evidence of skill and accuracy and product completion.</p> <p>Processes, tools and equipment are as identified at the production planning stage.</p>		

Section 3: Assessment Information

g) Produce an engineered product

Mark range 1-2	Mark range 3-4	Mark range 5-6
Production of an incomplete engineered product with some skill and accuracy.	Production of an engineered product that has been assembled and finished with skill, although there may be some aspects where accuracy or quality could still be improved on.	Production of a high-quality engineered product that has been assembled and finished with a high level of skill and accuracy.
<p><u>Expected Evidence</u></p> Witness testimony to support the part-completion of the product (1) Inspection sheets show part-product made with some skill and accuracy (1)	<p><u>Expected Evidence</u></p> Witness testimony to support completion, assembly and finish of engineered product (2) Inspection sheets that may show some lack of accuracy/quality (2)	<p><u>Expected Evidence</u></p> Witness testimony to support high quality completion, assembly and finish of engineered product (3) Inspection sheets show high level of skill and accuracy (3)
<p>Note: the use of 'accuracy' in the mark ranges implies the use of inspection sheets to present measurement data taken on parts made, checking dimensions against those specified, including tolerance bands. Marks given for this criterion would be expected to have coherence with those given at d) e) f), including for part-completion at the lower mark range. Witness testimony should be provided in support of candidate evidence of incomplete/complete product and of level of skill and accuracy.</p>		

h) Testing and evaluation*

Mark range 1-2	Mark range 3-4	Mark range 5-6
Carry out basic testing against some aspects of the product specification and demonstrate that the product has limited compliance with the required standards. Written evidence is poorly presented with little use of appropriate terminology.	Carry out a range of testing against the product specification and demonstrate that the product complies with the main required standards. Written evidence is generally free of errors and terminology mostly used appropriately.	Carry out objective testing against the product specification and demonstrate that the product consistently complies with the required standards. Written evidence is clear, with consistent use of spelling or punctuation and grammar and there is good use of accurate terminology.
<p><u>Expected Evidence</u></p> Test data that shows some basic testing of the product, poorly identified and presented (1) Use of the test data to show that the product has limited compliance to required standards, poor use of appropriate terminology (1)	<p><u>Expected Evidence</u></p> Test data from a range of testing identified and presented well (2) Use of the test data to show that the product complies with the main required standards with mostly good use of terminology (2)	<p><u>Expected Evidence</u></p> Quantitative data from repeated testing presented clearly with accurate terminology (3) Use of the test data to show that the product complies consistently with the required standards, written clearly and accurately with good use of accurate terminology.
<p>Note: this criterion requires that the completed functioning product is tested against the specified product performance, rather than the detailed production control measurements that are rewarded in g). *Credit for quality of written communication is built into Expected Evidence requirements. Note: a range of testing against requirements might include overall mass/weight/dimensions, qualitative output performance. Qualitative output performance might include features such as design load carried, alarm rings, lamp lights, output shaft rotates. Objective testing should include quantitative instrument measurements on output e.g. voltage outputs at different speeds, speed outputs at different pressures or loadings, long term tests; tests designed to show whole range of required standards.</p>		

FAQs: Preparing to teach controlled assessment

Before you can plan your teaching, you will need to have an idea of how the controlled assessment is to be assessed and what students have to do. Here are some important answers to your questions about controlled assessment.

What is controlled assessment?

Controlled assessment is the new name for coursework and is the new form of internal assessment required by QDCA to assess GCSE Engineering internally assessed units.

The main difference between the current style of assessment of coursework and controlled assessment is that assessment activities for units 1 and 2 must now be undertaken using various levels of control that are not currently in place.

There are three elements attached to controlled assessment and these are Task setting, Task taking and Task marking and these elements are subject to varying levels of control.

You should be mindful of the rules for terminal assessment. These state that 40% of the qualification must be submitted in the final assessment opportunity.

When can I offer the controlled assessment unit?

Candidates must submit their completed activities for controlled assessment in the summer series of any year. However this does not prevent candidates from being assessed much earlier in the year provided completed assessments are retained securely at the centre premises before submission by the 15th May of the assessment year.

Can I start Controlled Assessment in year 9?

Controlled assessment can be done at any time. Some centres start early and move on to other qualifications after an early finish. The first opportunity to 'Cash-In' an award is in June 2011.

When will I be able to access the task?

The controlled assessment task for each unit is published on the subject page of the Edexcel website (www.edexcel.com/quals/gcse/gcse09/engineering).

They are subject to review every two years and the current published tasks are valid from September 2009 to May 2011

The controlled assessment tasks for unit 1 and unit 2 will be published on Edexcel's website each September. Teachers will need to contextualise these tasks to ensure that the activities undertaken meet local needs and can also be undertaken with the resources available in individual centres.

Teachers can no longer give students an open choice or make suggestions regarding what they would like to do for a final GCSE project. From now on, controlled assessment tasks will be set by Edexcel and must be selected from, as starting points for projects. The level of control attached to Task Setting is 'high'.

When can candidates see the task?

You can give candidates the tasks whenever you feel they are ready. You may feel it is more appropriate to provide the controlled assessment task activity by activity, i.e. start with design activity or the make activity. Ideally the students will have had a substantial period of teaching about the core content and opportunities to collect primary and secondary evidence before they complete the controlled assessment tasks.

Can I set homework as part of Controlled Assessment?

As part of Controlled assessment, homework can be set, as long as the majority of work is done under medium levels of control and homework can be guaranteed by a teacher to be the exclusive work of an individual student.

Can students use ICT at home to do some of their write up?

ICT can be used at home to do some of the 'write up' as long as a draft version of the work to be produced is done under medium controlled conditions and is seen by a teacher. The completed work should be checked by a teacher to ensure that it matches the draft and can be guaranteed as that of the student.

Suggested resources to support teachers and students

Before you choose your controlled assessment option, you will need to have an idea of available resources to support your teaching of the course.

The following is a provisional list of resources which may be updated as publishers begin to produce new resources to this support controlled assessment topic.

2EG02 GCSE Engineering

- PP8888-1:2007 Drawing Practice
A Guide for schools and colleges to BS888:2007 Technical product specification (TPS) THIRD EDITION Isbn 978 0580 50868 4
- Customised Training - Training from Edexcel
- Ask the Expert
- Ask Edexcel
- Exemplar materials available on OSCA and Edexcel website - www.edexcel.com/quals/gcse/gcse09/engineering
- Podcast - www.edexcel.com/cap

NOTE: There are no books currently available for the 2009 specification. However the following were written for the 2002 specification. The engineering content is still relevant.

- ENGINEERING GCSE 2nd Edition - Mike Tooley
published by Newnes ISBN 07506 6576 9
- Engineering GCSE - Godfrey & Wallis published by Nelson Thornes
ISBN 0 7487 8551 5

