

**Sample assessment material**

**Cambridge National in**

# **Engineering Design**

**Cambridge OCR Level 1/Level 2 Cambridge National in  
Engineering Design**

**J822**

**R039: Communicating designs**

Version 6.0

[ocr.org.uk/cambridgenationals](http://ocr.org.uk/cambridgenationals)

## Introduction

**This is sample assessment material (SAM). It is an example Cambridge OCR-set assignment that we publish alongside a new specification to help illustrate the intended style and tasks of our set assignments.**

We also produce two further specific resources to support you with using this SAM:

- An assessment story where we explain the research we have undertaken during the development of the qualification and how consultation with teachers, students and schools has helped shape our assessment approach.
- A student guide to NEA assignments in which we provide a summary for your students of key points about their Cambridge OCR-set assignments, including the importance of avoiding plagiarism.

## Summary of updates

Section	Change	Version	Date
Tasks 1-4 You must/Advice sections	Updated to clarify what students are required to do and what is advisory for each task in the sample assignment.	6.0	June 2026

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# Cambridge OCR-set Assignment

## Sample Assessment Material

Cambridge OCR Level 1/Level 2 Cambridge National in Engineering  
Design Sample Set Assignment

Unit R039: Communicating designs

This is a sample set assignment which should only be used for practice.

This assignment **must not** be used for live assessment of students.

The live assignments will be available on our secure website, 'Teach Cambridge'.

**The Cambridge OCR administrative codes associated with this unit are:**

- unit entry code R039
- certification code J822

**The regulated qualification number associated with this unit is:**

603/7086/5

**Duration: Approximately 10 - 12 hours**

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# Information for teachers

## Using this assignment

### You must:

- familiarise yourself with the Assessment Guidance relating to the tasks. This is with the unit content in Section 4 of the [Specification](#).
- read and understand **all** the rules and guidance provided in Section 6 of the [Specification](#) **before** your students complete and you assess the set assignment.
- make sure that completion and assessment fully adhere to the rules and guidance provided in Section 6 of the [Specification](#).
- give students the [Engineering Design Student guide to NEA assignments](#) before they start the assignment.
- allow students approximately 10-12 guided learning hours (GLH) to complete all tasks.

### You must not:

- change or modify this assignment in any way.

# Scenario for the assignment

## Designing a torch

A company produces a range of torches for use in the home. Torches are an essential item to have whether used in the home, outside during the winter months or carried in the car in case of emergencies.

The company has been asked to design a free gift for a national breakdown service. As the design engineer, you have been tasked with designing the torch that will be given to new customers when they join as a member.



A torch should:

- consist of a moulded construction with space for internal components
- include a method to secure to the wrist
- be ergonomic to hold for long periods
- be aesthetically pleasing
- include a space for corporate branding
- have a method to turn the torch on and off
- have access for changing the batteries
- be compact and space saving
- incorporate LED for providing a bright light.

**Read through all of the tasks carefully, so that you know what you will need to do to complete this assignment.**

**Important:**

- You will need to refer to the marking criteria grid. Your teacher can explain the marking criteria if you need further clarification.
- You will need to draw upon relevant skills/knowledge/understanding from other units you have studied in this qualification.

# Your tasks and marking grids

## Task 1 – Manual production of freehand sketches

Topic Area 1.1 is assessed in this task.

You are required to produce a range of design proposals for the torch.

You **must**:

- use freehand sketching techniques to present your initial concepts for the torch.
- use annotation and labelling techniques to explain your concepts.
- produce sketches of your design proposals using suitable methods.
- select your preferred design proposal and justify how it meets the design specification.
- use both 2D and 3D sketching techniques.
- include shading, tonal, and texturing techniques to enhance your design work.

Total marks for Task 1: 18 marks

### Advice

- Whilst annotating, aim to thoroughly explain and justify how your design meets the design specification.

### Topic Area 1: Manual production of freehand sketches

MB1: 1–4 marks	MB2: 5-8 marks	MB3: 9-12 marks
<p>Produces a <b>limited</b> range of creative freehand design proposals.</p> <p><b>Limited</b> consideration of the design specification.</p> <p>Uses a <b>basic</b> range of techniques.</p>	<p>Produces an <b>adequate</b> range of creative freehand design proposals.</p> <p><b>Partial</b> consideration of the design specification.</p> <p>Uses an <b>adequate</b> range of techniques.</p>	<p>Produces a <b>wide</b> range of creative and innovative freehand design proposals.</p> <p><b>Fully</b> considers the design specification.</p> <p>Uses a <b>comprehensive</b> range of techniques.</p>
MB1: 1–2 marks	MB2: 3-4 marks	MB3: 5-6 marks
<p>Evidence of analysis of design proposals with <b>limited</b> annotation.</p> <p>Justification demonstrates <b>limited</b> understanding of needs and wants of the client/user.</p>	<p>Evidence of analysis of design proposals, with <b>some</b> annotation.</p> <p>Justification demonstrating <b>some</b> understanding of needs and wants of the client/user.</p>	<p>Extensive evidence of analysis of design proposals that are <b>fully</b> annotated.</p> <p>Justification demonstrating a <b>detailed</b> understanding of needs and wants of the client/user.</p>

If your work does not meet any Mark Band 1 criteria, you will be awarded zero marks for this task.

## Task 2 – Manual production of freehand sketches – design development

Topic Area 1.1 is assessed in this task.

Having chosen a design proposal, the national breakdown service has asked you to present your proposal for the torch.

You **must**:

- use freehand sketching techniques to present your developed concept for the torch.
- use annotation and labelling techniques to explain your concepts.
- include shading, tonal, and texturing techniques to enhance your design work.
- produce 2D and 3D sketches of your developed concept using suitable methods.
- explain how it meets the design specification.

Total marks for Task 2: 12 marks

### Advice

- Explain all of the key features using annotation and labelling.

### Topic Area 1: Manual production of freehand sketches - Design Development

MB1: 1–4 marks	MB2: 5-8 marks	MB3: 9-12 marks
Produces a <b>basic</b> freehand sketch of design proposal.	Produces <b>adequate</b> freehand sketches of design proposal.	Produces <b>comprehensive</b> freehand sketches of design proposal.
<b>Brief</b> explanation of the key features of a design proposal with <b>limited</b> annotation.	<b>Adequate</b> explanation of the key features of a design proposal with <b>some</b> annotation.	<b>Detailed</b> explanation of the key features of a design proposal that is <b>fully</b> annotated.
<b>Limited</b> consideration of the design specification.	<b>Some</b> consideration of the design specification.	<b>Fully</b> considers the design specification.

If your work does not meet any Mark Band 1 criteria, you will be awarded zero marks for this task.

## Task 3 – Production of engineering drawings

Topic Area 2.1 is assessed in this task.

The national breakdown service want you to develop your selected design proposal. You should use a range of engineering and assembly drawing techniques to present your design solution.

You **must**:

- produce Engineering drawings using traditional drawing methods such as drawing boards or a Computer Aided Design package.
- produce a 3<sup>rd</sup> angle orthographic projection drawing that includes a range of dimensions.
- produce an assembly drawing that shows the main elements of your developed concept.
- use assembly drawing techniques such as isometric and exploded views, or sectional views.

Total marks for Task 3: 12 marks

### Advice

- Dimension your 3<sup>rd</sup> angle orthographic using standard conventions and scale your engineering drawing if necessary.

### Topic Area 2: Production of engineering drawings

MB1: 1–4 marks	MB2: 5-8 marks	MB3: 9-12 marks
Produces a <b>basic</b> orthographic drawing.  Produces an assembly drawing that is <b>limited</b> in detail.	Produces an <b>adequate</b> and accurate orthographic drawing.  Produces an assembly drawing with <b>some</b> detail.	Produces a <b>comprehensive</b> orthographic drawing.  Produces a <b>fully</b> detailed assembly drawing.

If your work does not meet any Mark Band 1 criteria, you will be awarded zero marks for this task.

## Task 4 – Use of Computer Aided Design (CAD)

Topic Area 3.1 is assessed in this task.

Your final design proposal needs to be modelled for the national breakdown service prior to consideration for manufacture.

You **must**:

- use CAD to produce 3D virtual models of your design proposal.
- add rendering, textures, dimensioning and assembly views in your CAD drawings.
- show your virtual model from different viewpoints.
- produce 3D virtual models that include multiple components as part of a CAD assembly.
- use annotated screen shots to show step-by-step how you have used the CAD software.

Total marks for Task 4: 18 marks

### Advice

- Render your design with different materials.

### Topic Area 3: Use of Computer Aided Design (CAD)

MB1: 1–6 marks	MB2: 7-12 marks	MB3: 13-18 marks
Use of CAD to produce a <b>simple</b> model of the design proposal.  A <b>simple</b> 3D virtual model consisting of a very limited number of components.	Use of CAD to produce an <b>adequate</b> model of the design proposal.  An <b>adequate</b> 3D virtual model consisting of some components.	Use of CAD to produce a <b>complex</b> model of the design proposal.  A <b>detailed</b> 3D virtual model consisting of many components.

If your work does not meet any Mark Band 1 criteria, you will be awarded zero marks for this task.

# Marking criteria words

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

## Mark Band (MB1) Words:

Word	Meaning
<b>Basic</b>	<ul style="list-style-type: none"> <li>• Work includes the minimum required. It is a starting point but is simplistic and not developed.</li> <li>• Understanding and skills are applied in a way that partly achieves the wanted or intended result, but it would not be useable without further input or work.</li> </ul>
<b>Brief/Briefly</b>	<ul style="list-style-type: none"> <li>• Work includes a small number of relevant facts or concepts but lacks detail, contextualisation or examples.</li> </ul>
<b>Dependent</b>	<ul style="list-style-type: none"> <li>• The student can perform a task when given regular assistance or help</li> </ul>
<b>Few</b>	<ul style="list-style-type: none"> <li>• Work produced is restricted or narrow. It includes less than half of the information or examples expected for a full response.</li> </ul>
<b>Inefficient</b>	<ul style="list-style-type: none"> <li>• Outputs are produced but with great expense or effort because of poor organisation or design and not making the best use of available resources.</li> </ul>
<b>Limited</b>	<ul style="list-style-type: none"> <li>• Work produced is restricted in range or scope and includes only some of the information required. It evidences partial rather than full understanding.</li> <li>• Work produced is a starting point rather than a developed process, concept or output.</li> </ul>
<b>Minimal</b>	<ul style="list-style-type: none"> <li>• Includes very little in amount or quantity required.</li> </ul>
<b>Simple</b>	<ul style="list-style-type: none"> <li>• Includes a small number of relevant parts, which are not related to each other.</li> </ul>
<b>Superficial</b>	<ul style="list-style-type: none"> <li>• Work completed lacks depth and detail.</li> </ul>

**Mark Band (MB2) Words:**

<b>Word</b>	<b>Meaning</b>
<b>Adequate(ly)</b>	<ul style="list-style-type: none"> <li>• Work includes the appropriate number of relevant facts or concepts but does not include the full detail, contextualisation or examples.</li> </ul>
<b>Assisted</b>	<ul style="list-style-type: none"> <li>• The student can perform a task with occasional assistance or help.</li> </ul>
<b>Part(ly)/Partial</b>	<ul style="list-style-type: none"> <li>• To some extent but not completely.</li> <li>• Work produced is inclusive in range and scope. It evidences a mainly developed application of understanding, performance or output needed.</li> <li>• Work produced results in a process, concept or output that would be useable for its purpose.</li> </ul>
<b>Some</b>	<ul style="list-style-type: none"> <li>• Work produced is inclusive but not fully comprehensive. It includes over half the information or examples expected for a full response.</li> </ul>
<b>Sound</b>	<ul style="list-style-type: none"> <li>• Valid, logical, shows the student has secured most of the relevant understanding, but points or performance are not fully developed.</li> <li>• Applies understanding and skills to produce the wanted or intended result in a way that would be useable.</li> </ul>

**Mark Band (MB3) Words:**

<b>Word</b>	<b>Meaning</b>
<b>Accurate(ly)</b>	<ul style="list-style-type: none"> <li>Acting or performing with care and precision.</li> <li>Correct in all details.</li> </ul>
<b>All</b>	<ul style="list-style-type: none"> <li>Work produced is fully comprehensive and wide-ranging. It includes almost all, or all the information or examples expected for a full response.</li> </ul>
<b>Clear(ly)</b>	<ul style="list-style-type: none"> <li>Focused and accurately expressed, without ambiguity.</li> </ul>
<b>Complex</b>	<ul style="list-style-type: none"> <li>Includes many relevant parts, all of which relate to each other logically.</li> </ul>
<b>Comprehensive(ly)</b>	<ul style="list-style-type: none"> <li>The work produced is complete and includes everything required to show depth and breadth of understanding.</li> <li>Applies the understanding and skills needed to successfully produce the wanted or intended result in a way that would be fully fit-for-purpose.</li> </ul>
<b>Consistent(ly)</b>	<ul style="list-style-type: none"> <li>A level of performance which does not vary in quality over time.</li> </ul>
<b>Critical</b>	<ul style="list-style-type: none"> <li>Objective analysis and evaluation in order to form: a judgement, evaluation of the evidence or effective trouble shooting/fault finding.</li> </ul>
<b>Detailed</b>	<ul style="list-style-type: none"> <li>Gives point by point consideration of all the key information.</li> </ul>
<b>Effective</b>	<ul style="list-style-type: none"> <li>Applies the skills required to the task and is successful in producing the desired or intended result.</li> <li>The work produced is effective in relation to a brief.</li> </ul>
<b>Efficient</b>	<ul style="list-style-type: none"> <li>Able to produce results or outputs with the minimum expense or effort, because of good organisation or design and making the best use of available resources.</li> </ul>
<b>Full(y)</b>	<ul style="list-style-type: none"> <li>Work produced is comprehensive in range and scope. It evidences a fully developed application of understanding, performance or output needed.</li> <li>Work produced results in a process, concept or output that would be fully fit-for-purpose.</li> </ul>
<b>Independent(ly)</b>	<ul style="list-style-type: none"> <li>The student can perform a task without assistance or reliance on others</li> </ul>
<b>Justify/Justified</b>	<ul style="list-style-type: none"> <li>The reasons for doing something are explained in full.</li> </ul>
<b>Most(ly)</b>	<ul style="list-style-type: none"> <li>Includes nearly all of what is expected to be included.</li> </ul>
<b>Wide (ranging)</b>	<ul style="list-style-type: none"> <li>Includes many relevant details, examples or contexts; all of which are fully detailed, contextualised or exemplified.</li> </ul>

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