

Live Assessment

Assessment Material

OCR Level 1/2 Cambridge National Award in Engineering Design
OCR Level 1/2 Cambridge National Certificate in Engineering Design

R107: Developing and presenting engineering designs

Please note:

This OCR model assignment is to be used to provide evidence for the unit identified above. Alternatively, centres may 'tailor' or modify the assignment within permitted parameters (see Information for Teachers). It is the centre's responsibility to ensure that any modifications made to this assignment allow learners to show that they can meet all of the learning outcomes and provide sufficient opportunity for learners to demonstrate achievement across the full range of marks.

INSTRUCTIONS TO TEACHERS

The OCR administrative codes associated with this unit are:

- unit entry code R107
- certification codes Award J831 / Certificate J841

The accreditation numbers associated with this unit are:

- unit reference number R/505/3546
- qualification reference(s) Award [601/1410/1] / Certificate [601/1411/3]
- **Duration: Approximately 10-12 hours**

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Contents

	Page Number(s)
INFORMATION FOR LEARNERS	3
Scenario for the assignment	4
This section contains the assignment background which learners will need to be familiar with in order to complete the tasks.	
Your Tasks	5
This section contains all the tasks learners must complete before work can be submitted for assessment.	
INFORMATION FOR TEACHERS	6
Guidance on using this assignment	7 - 9
This section provides guidance to centre staff on the preparation and completion of the assignment.	

Live Assessment: Information for Learners

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Scenario for the Assignment



A new portable docking station is to be produced for use with MP3 devices or phones.

The docking station will:

- be battery powered
- require easy access to replace batteries
- connect to MP3 devices/phones using a 3.5mm jack plug
- incorporate two speakers
- incorporate an on/off switch
- have a power on indicator
- have a method to control volume
- be compact
- be free standing

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

Your Tasks

Task 1: Developing and presenting design proposals

Learning Outcome 1: Be able to generate design proposals using a range of techniques is assessed in this task.

You are required to produce a range of design proposals for the docking station. Your work should use:

- freehand drawing techniques to present your initial concept ideas for the docking station
- annotation and labelling techniques to demonstrate design ideas
- IT software to produce and modify design proposals.

You should demonstrate your ability to draw upon relevant skills/knowledge/understanding from other units you have studied in this task.

Task 2: Developing designs using engineering drawing techniques

Learning Outcome 2: Know how to develop designs using engineering drawing techniques and annotation, is assessed in this task.

You are required to develop your selected design proposal for the docking station. Your work should use engineering drawing techniques to present design solutions.

Task 3: Produce and communicate design proposals using Computer Aided Design (CAD)

Learning Outcome 3: Be able to use Computer Aided Design (CAD) software and techniques to produce and communicate design proposals is assessed in this task.

Your final design proposal is to be formally presented prior to consideration for manufacture. You should use:

- CAD applications to produce your final design proposal
- appropriate techniques to present and communicate your final design.

Information for Teachers

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Guidance on using this assignment

1 General guidance

- 1.1 OCR assignments are available to download free of charge from our website:
www.ocr.org.uk
- 1.2 OCR assignments are intended to be used for summative assessment of learners. The OCR specification gives more information on the arrangements for assessing internally assessed units.
- 1.3 This assignment has been designed to meet the full assessment requirements of the unit. Learners will need to take part in a planned learning programme that covers the underpinning knowledge, understanding and skills of the unit.

2 Before carrying out the assignment

- 2.1 Learners should be provided with a copy of the *Information for Learners* section of this assignment.
- 2.2 Learners will not need to carry out any preparations prior to undertaking the assessment tasks, such as collating resources to use in the assessment
- 2.3 We have estimated that it will take approximately 10-12 hours to complete all tasks. Learners would need approximately 4-5 hours to complete Task 1 and approximately 2-3 hours to complete Task 2 and 3-4 hours to complete Task 3. These timings are for guidance only but should be used by the teacher to give learners an indication of how long to spend on each task. Centres can decide how the time can be allocated between each part or individual task. Centres are also permitted to spread the tasks across several sessions and therefore it is permissible for evidence to be produced over several sessions.

3 When completing the assignment and producing evidence

- 3.1 Each learner must produce individual and authentic evidence for each task within the assignment.
- 3.2 Centre staff may give support and guidance to learners. This support and guidance should focus on checking that learners understand what is expected of them and giving general feedback that enables the learner to take the initiative in making improvements, rather than detailing what amendments should be made. It is not acceptable for teachers/deliverers to provide answers, to work through answers in detail or to detail specifically what amendments should be made.
- 3.3 Learners may use information from any relevant source to help them with producing evidence for the tasks.
- 3.4 Learners must be guided on the use of information from other sources to ensure that confidentiality is maintained at all times.

- 3.5 Usually, the type of evidence required may be modified, with the exception of certain types of evidence listed below under '*Permitted changes*'. It is important to note that it is possible to generate the evidence in a variety of formats. Centres must advise learners as to the most appropriate format of evidence. The nature of this assessment means that learners are free to use the format that they feel is most appropriate for the purpose and target audience for each individual task (see Section 6).

4 Presentation of work for marking and moderation

- 4.1 Centres wishing to produce digital evidence in the form of an e-portfolio should refer to the appendix in the specification on guidance for the production of electronic assessment.
- 4.2 Centres may wish to discourage learners from excessive use of plastic wallets for presentation of their evidence as this may hinder the assessment process. Instead centres may wish to encourage learners to present their work so that it is easily accessible, e.g. spiral bound, stapled booklet, treasury tag.
- 4.3 All work must be marked against the marking criteria for the unit. Marks are allocated to learning outcomes rather than tasks. Please see Appendix B Marking criteria for centre assessment and Section 4 The centre assessed units in the specification for this qualification for more information on marking, moderation and submission of work.

5 Scope of permitted model assignment modification

The model assignment is self-contained in its present form. The set of tasks form a coherent whole addressing all the learning outcomes and allowing access to the full range of marks.

You must not change the following:

- the learning outcomes
- the marking criteria
- the requirements for supervision and authentication as described in the specification (Section 4 *The centre assessed units*)
- the maximum duration for completion of the assignment.

Permitted changes:

The model assignment can be modified in terms of the areas described below but centres must be sure that learners still have the opportunity to cover all of the learning outcomes and to access the full range of marks:

- the scenario, which can be contextualised or amended to suit local needs
- each specific task may be appropriately contextualised to match with any permitted changes you have made to the scenario.

Should the centre change the context of the assignment they must make sure that the product to be designed and prototyped is of equal complexity to that given in this model assignment.

OCR has ensured that in the language used and the tasks and scenario provided we have avoided discrimination, bias and stereotyping and support equality and diversity. In the development of qualifications and assessments we use the guidance given in the Ofqual publication *Fair access by design*, notably this includes:

- using language and layout in assessment materials that does not present barriers to learners
- using stimulus and source materials in assessment materials (where appropriate) that do not present barriers to learners.

If centres wish to modify the model assignment we strongly advise that staff responsible for modifying the model assignment and the quality assurance of it refer to the publication *Fair access by design*.

If modifications are made to the model assignment, whether to just the scenario or to both the scenario and individual tasks, it is up to the centre to ensure that all learning outcomes can still be met and that learners can access the full range of marks.

6 Specific guidance on the task

Task 1

Learners are expected to produce a range of design ideas that respond to the given design specification. Designs should be presented using both freehand sketching and with the use of software and presentation techniques to enrich design proposals. Detailed annotation of designs should be used to help illustrate the function, material choice, assembly methods, etc.

Learners could use knowledge gained in unit R105 to influence their design ideas.

Task 2

Learners will require access to drawing boards and drawing instruments. 2D and 3D techniques with appropriate annotation should be used. Isometric and exploded isometric would be regarded as two 3D techniques.

Free hand sketching and instrument drawing would be regarded as two 2D techniques.

Task 3

Learners should use CAD software to produce formal presentation drawings of their final design proposals. CAD techniques may include rendering, texture, dimensions, assembly views, etc. Appropriate techniques to present and communicate the final design could include display boards, models and power point.

Total marks for assignment: 60