

Live Assessment Material

Set Assignment

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

Unit R106: Product analysis and research

Set A

Please note:

This OCR set 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 R106
- certification codes Award J831 / Certificate J841

The accreditation numbers associated with this unit are:

- unit reference number K/505/3536
- qualification reference(s) Award [601/1410/1] / Certificate [601/1411/3]

Duration: Approximately 10-12 hours

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Version 3 July 2020 - Set A added to Front Cover, no other changes made.

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Set Assignment: Information for Learners

OCR Level 1/2 Cambridge National Award in Engineering Design
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Unit R106: Product analysis and research

Scenario for the Assignment

Many householders experience problems with flooding due to burst pipes or extreme weather. Simple pumps that can be powered by an electric drill are widely available to help remove water from flooded areas. However, testing of some of these pumps has shown that they can fail to perform correctly.

You have been asked by a pump manufacturer to undertake product analysis of both its own and competitor's pump products to establish the strengths and weaknesses of the designs.

You will also consider the factors that influence the design of these pump products.



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: Analysis of existing drill-powered pump solutions

Learning Outcome 1: Know how commercial production methods, quality and legislation impact on the design of products and components; Learning Outcome 2: Be able to research existing products; and Learning Outcome 3: Be able to analyse an existing product through disassembly, are assessed in this task.

You are to undertake product analysis of a range of drill-powered pump products to establish the strengths and weaknesses of the designs. As part of your analysis you should consider the factors that influence the design of these pump products.

Your analysis should include:

- the identification of strengths and weaknesses within existing pump products through the use of primary and secondary research methods to consider:
 - structured disassembly considering components, assembly methods, materials, production methods and maintenance
- consideration of the impact of commercial production and manufacturing processes upon the design of existing pump products
- consideration of the impact of product end of life considerations upon the design of existing pump products
- consideration of the impact of conformity to legislation and standards upon the design of existing pump products.

Your research outcomes should be presented in a report which will be used to inform future design of *pump products*.

Information for Teachers

OCR Level 1/2 Cambridge National Award in Engineering Design
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Unit R106: Product analysis and research

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 10–12 hours to complete Task 1. 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 set assignment modification

The set 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 set 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 set 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 set assignment we strongly advise that staff responsible for modifying the set assignment and the quality assurance of it refer to the publication *Fair access by design*.

If modifications are made to the set 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 use both primary and secondary research methods when undertaking existing product research. Where possible, learners should use manufacturer's information to carry out structured disassembly of existing products whilst undertaking product analysis.

Learners must be supervised to ensure the use of safe working practices when undertaking disassembly.

Total marks for assignment: 60

Witness Statement – Task 1

LEARNER NAME	
Date	
Unit	R106 - Product analysis and research
LO2	Be able to analyse an existing product through disassembly

Independent working to safely disassemble products using appropriate tools and instruments

Witness observations	
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Name of witness: _____

Relationship to learner: _____

Assessor comments: How the observations demonstrate achievement against the marking criteria

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RECORD OF QUESTIONS/ANSWERS (if applicable)

ASSESSOR QUESTION 1
LEARNER RESPONSE 1
ASSESSOR QUESTION 2
LEARNER RESPONSE 2
ASSESSOR QUESTION 3
LEARNER RESPONSE 3

ASSESSOR SIGNATURE:		DATE:	
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LEARNER SIGNATURE:		DATE:	
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