

Model Assignment

Issued September 2008

OCR Level 2 Principal Learning in Engineering

Unit F555: Innovation, enterprise and technological advance

Please note:

This OCR model assignment may be used to provide evidence for the unit above. Alternatively, centres may 'tailor' the assignment within permitted parameters (see 'Notes for Tutors'). It is the centre's responsibility to ensure that any adaptations made to this assignment allow learners to meet all the assessment objectives and provide sufficient opportunity for learners to demonstrate achievement across the full range of marks.

The scheme codes for these qualifications are:

OCR Principal Learning in Engineering Level 2 500/2399/8

The QCA Accreditation Number for this unit is:

Unit F555: innovation, enterprise and technological advance R/501/1894

This OCR model assignment remains live for the life of these qualifications.

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Model Assignment: Learner Information

OCR Level 2 Principal Learning in Engineering

Unit F555: Innovation, enterprise and technological advance

Model Assignment

Description of Model Assignment.

This unit is about innovation and creativity and how it has been at the forefront of engineering developments from the 20th century into the 21st century. It is also about their relative importance which is set to increase significantly in the future.

In this unit you will understand the importance of the development of new ideas and how new ideas are intellectually protected.

You will understand the ways in which businesses benefit and profit from new ideas and the way in which new ideas and developments effect technological change in the home, businesses, the economy and society.

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

Tasks

Task 1: Innovation and creativity in engineering

Assessment Criterion 1.1

Your task is to:

- select a product from the list of products identified by OCR. In relation to the product you have chosen you will detail and justify how creativity and innovation benefit:
 - the home
 - businesses
 - the economy
 - society

You will record all your research, findings, observations, analysis and individual conclusions in a workbook.

Task 2: Protection of new ideas

Assessment Criterion 2.1

Your task is to:

- for the product you have chosen you will detail and justify how ideas and new developments are protected and what this means in real terms for example 'intellectual property'

You will investigate:

- costs involved
- process of application and registration
- effects on other products
- effects on manufacturing
- issues with regards to advertising
- other legal related issues
- consumer issues

You will record all your research, findings, observations, analysis and individual conclusions in a workbook.

Task 3: Research, development and raising finance

Assessment Criterion 3.1

Your task is to:

- explore the roles of research and development (R&D) and raising finance when developing new products
 - explain the interrelationship between R&D and raising finance
 - explain the effects that R&D and raising finance have on the manufacture of a product

- research the different methods and the advantages and disadvantages of:
 - initial research costs
 - development costs
 - different and alternative methods of financing
 - advertising of the product before, during and after manufacture
 - safe disposal at the end of the products working life
 - depreciation of plant
 - effects of manufacturing turnover

You will record all your research, findings, observations, analysis and individual conclusions in a workbook.

Task 4: Developments in materials and processes

Assessment Criteria 4.1, 4.2

Your task is to:

- research new engineering materials, technologies and processes and assess their impact on new products

- understand the effects and impact of new engineering materials, new engineering technologies and new engineering processes:
 - in the home
 - in the workplace
 - on the built environment

You will record all your research, findings, observations, analysis and individual conclusions in a workbook.

Task 5: Social and sustainability issues

Assessment Criterion 5.1

Your task is to:

- research and explain the environmental and social impact of engineering and sustainability of resources

- explain the effects, impacts, advantages, disadvantages of:
 - the use of different materials
 - the use of newer and older technologies
 - a variety of different processing methods
 - different methods of extraction
 - safe disposal of materials during and after manufacture
 - different forms of energy supply

You will record all your research, findings, observations, analysis and individual conclusions in a workbook.

Model Assignment: Tutor Information

OCR Level 2 Principal Learning in Engineering

Unit F555: Innovation, enterprise and technological advance

Guidance for Centres

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1.1 OCR model assignments are issued free to participating centres and are also available to download from our website: www.ocr.org.uk.

1.2 Centres may choose to:

- use OCR model assignments for formal summative assessment of learners
- tailor OCR model assignments for formal summative assessment of learners

It is intended that this model assignment can be used by centres without modification. However, in order to provide appropriate contextualisation, improve access or increase local relevance, centres may 'tailor' the model assignments within set parameters. Details of the scope of adaptation are provided in the 'Notes for Tutors' section of this document.

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 and skills of the unit.

2 Before carrying out the assignment

2.1 Learners should be provided with a copy of the *Learner Information* section of this assignment or the centre adapted model assignment.

2.2 Learners may carry out preparations prior to undertaking the tasks.

3 When completing the assignment

3.1 All assessment evidence must be produced under **controlled conditions** so that the overall level of permit control secures validity and reliability, provides good manageability for all involved and allows teachers to authenticate the work confidently. Further guidance on **controlled conditions** is provided within the OCR Principal Learning Handbook.

3.2 Learners should be allowed 60 guided learning hours (glh) to complete all of the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. It is suggested that evidence is produced in several sessions.

3.3 Each learner must produce individual and authentic evidence for each task within the assignment.

3.4 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. It is not acceptable for presenters to provide model answers or to work through answers in detail.

- 3.5 Learners may use information from any relevant source to help them with producing evidence for the tasks.
- 3.6 Learners must be guided on the use of information from other sources to ensure that confidentiality is maintained at all times.

4 After completing the assignment

- 4.1 Learners' evidence is assessed by the centre's assessor against the qualification specification contained in the Principal Learning Handbook. When marking learners' work, centres **must** use the descriptors provided within the unit. For further information about assessment please refer to the section on Assessment and Moderation in the Principal Learning Handbook.
- 4.2 Assessors' decisions should be quality assured across the centre through internal moderation. For further information about internal moderation please refer to the section on Assessment and Moderation in the Principal Learning Handbook.

5 Presentation of work

- 5.1 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, CD ROM.

6 Acceptable evidence

- 6.1 For guidance on generation and collection of evidence please refer to the section on Assessment and Moderation in the Principal Learning Handbook.

Notes for Tutors

Introduction to the Tasks

The tasks have been designed to enable learners to demonstrate their knowledge and understanding of innovation and creativity and how it has been at the forefront of engineering developments from the 20th century into the 21st century.

It is also about their relative importance which is set to increase significantly in the future.

The learner is required to complete a research assignment based on a specific product.

Learners will select from a list of products identified by OCR which will be updated on a two yearly cycle. This will give continuity over a two year course and give presenters planning time.

Learners should record all their research, findings, observations, analysis and individual conclusions in a workbook.

The sections of the workbook match the assessment criteria for the unit and prompts are provided for each section of the workbook to elicit appropriate responses from learners as well as accommodating extended learner findings and evaluations.

The learner should have the workbook available throughout their study of the unit and may return to an earlier section in the light of any new discoveries. Should it be necessary to illustrate a particular point, photos, sketches, drawings and other presentation methods may be used.

Teachers/tutors/presenters should note that the assessment criteria are accessed solely by the learners' completion of a workbook, the learners' individual responses to the specific set prompts and additional graphical evidence supported by learner annotations

The model assignment has been designed so that all of the assessment criteria in Unit F555 are addressed.

These guidance notes should be used in conjunction with the unit specification and Principal Learning Handbook.

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 assessment criteria.

It is permissible to contextualise or carry out modification of this model assignment in order to provide appropriate contextualisation, improve access or increase local relevance. However, centres must take great care when 'tailoring' tasks to ensure that modifications do not result in the over direction of learners, devalue the applied nature of the work or deny the learner the opportunity to generate evidence for all the assessment criteria at all levels of outcome.

No changes to the assessment criteria are allowed.

The model assignments can be changed in terms of:

- the product selected
- the range of research materials
- each specific task linked to a particular assessment criteria may be appropriately contextualised.

When completing this model assignment it may be possible to generate evidence for completing a task in a variety of formats. This list is not exhaustive and will depend on the approach taken to complete the task or model assignment. In some cases the task or model assignment will require a specific format for the outcome and this will be clearly marked in the table.

Depending on the approach taken to the model assignments it may also be possible to demonstrate additional PLTS coverage and some additional opportunities have been listed below.

Task activity	Nature of evidence generated	Potential Assessment Criteria coverage
<p>Task 1</p> <p>Innovation and creativity in engineering</p>	<p>Related to the chosen product the learner will:</p> <p>Detail and justify how creativity and innovation benefit engineering in respect of:</p> <ul style="list-style-type: none"> ○ technological change in the home ○ businesses ○ the economy ○ society 	<p>Assessment Criterion</p> <ul style="list-style-type: none"> • 1.1 <p>PLTS</p> <ul style="list-style-type: none"> • IE4
<p>Task 2</p> <p>Protection of new ideas</p>	<p>Detail how protection of the design idea has been achieved and what this means in real terms e.g. intellectual property.</p>	<p>Assessment Criterion</p> <ul style="list-style-type: none"> • 2.1 <p>PLTS</p> <ul style="list-style-type: none"> • None
<p>Task 3</p> <p>Research, development and raising finance</p>	<p>Relate specific details of the research, development and raising finance when developing new products in respect of:</p> <ul style="list-style-type: none"> • initial research costs • development costs • different and alternative methods of financing • advertising of the product before, during and after manufacture • safe disposal at the end of the products working life • depreciation of plant • effects of manufacturing turnover 	<p>Assessment Criterion</p> <ul style="list-style-type: none"> • 3.1 <p>PLTS</p> <ul style="list-style-type: none"> • None

<p>Task 4</p> <p>Developments in materials and processes</p>	<p>Explain and justify the impact and effects of engineering technological development in respect of:</p> <ul style="list-style-type: none"> • new engineering materials • new engineering technologies • new engineering processes: <ul style="list-style-type: none"> ○ in the home ○ in the workplace ○ on the built environment 	<p>Assessment Criteria</p> <ul style="list-style-type: none"> • 4.1, 4.2 <p>PLTS</p> <ul style="list-style-type: none"> • IE3 • IE4 • IE5 • IE6
<p>Task 5</p> <p>Social and sustainability issues</p>	<p>Explain and evidence the environmental and social impact of engineering and sustainability of resources.</p> <p>Explain the effects, impacts, advantages, disadvantages of:</p> <ul style="list-style-type: none"> • the use of different materials; • the use of newer and older technologies; • a variety of different processing methods; • different methods of extraction; • safe disposal of materials during and after manufacture; • different forms of energy supply. 	<p>Assessment Criterion</p> <ul style="list-style-type: none"> • 5.1 <p>PLTS</p> <ul style="list-style-type: none"> • IE3 • IE4