

# Model Assignment

## Issued September 2008

OCR Level 3 Principal Learning in Engineering

Unit F556: Engineering businesses and the environment

**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 3                      500/2400/0

**The QCA Accreditation Number for this unit is:**

Unit F556: Engineering businesses and the environment                      H/501/1897

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

ALL THESE MATERIALS MAY BE PHOTOCOPIED. Any photocopying will be done under the terms of the Copyright Designs and Patents Act 1988 solely for the purposes of assessment.

# Contents

	Page Number(s)
<b>LEARNER INFORMATION</b> <b>Model Assignment</b> This section contains the assignment background which learners will need to be familiar with in order to complete the tasks.	<b>3</b> <b>4</b>
<b>Tasks</b> This section contains all the tasks learners must complete before submission for assessment.	<b>5 - 8</b>
<b>TUTOR INFORMATION</b> <b>Guidance for centres</b> This section provides general guidance to centre staff on the preparation and completion of the assignment.	<b>9</b> <b>10 - 11</b>
<b>Notes for tutors</b> This section provides additional guidance and support to centre staff for each task. It is not intended for use by learners.	<b>12 - 16</b>

# Model Assignment: Learner Information

OCR Level 3 Principal Learning in Engineering

Unit F556: Engineering businesses and the environment

# Model Assignment

## Description of Model Assignment.

---

This unit has two parts.

### **1a: Engineering businesses and career pathways.**

You will consider the organisation of engineering businesses and the influence of external and internal factors which include: career pathways, employee and business registration and regulation, role of project management, contractual arrangements, legislative requirements, and the importance and function of risk assessment.

### **1b: Engineering and the environment.**

You will examine the possible problems and solutions associated with 'Engineering and the environment' addressing issues such as: resource depletion, air and water pollution control, the management and reduction of solid, liquid and hazardous waste, together with associated changes in the environment.

In addition, you will explore the possible effects of external environmental factors on an engineering business and how these may be managed. You will carry out simple chemical analysis of environmental samples and interpret the data obtained.

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

# Tasks

## Part 1a Engineering businesses and career pathways

### Task 1: Types of manufacturing processes and systems

---

#### Assessment Criteria 1.1, 1.2, 1.3, 1.4

You are to identify a business within the sector skill area you are studying.

#### Your task is to:

- fully describe and explain the internal business structure. You will consider:
  - management and departmental structure
  - lines of responsibility
  - relationship and communication channels between departments
- investigate the job roles identified in the business structure and the career pathways available in engineering,
- outline and explain the internal and external factors affecting businesses operating within the sector skill area you are studying. You should consider national, regional and local factors:
 

○ business legislation	○ health and safety
○ legal contracts	○ local planning restrictions
○ employment law	○ transport and logistics
○ equal opportunities	○ social responsibility
○ ethical business practice	○ other business specific factors.
- analyse risks, and their effects on, the business:
 

penalty clauses	employment issues
financial considerations	development and planning
logistical issues	legislation
health and safety risks	

Your work should be presented as part of a structured report that covers all tasks contained in this document.

## Task 2: Project management and responsibilities

---

### Assessment Criterion 2.1

Project management plays an important role within engineering organisations. To understand how effective project management operates, you will need to study the methodology used in project management within either a business operating in the sector skill area you are studying or by taking part in a devised team exercise in project management. The exercise should be typical of the type carried out within the engineering sector you are studying and should follow the progress of a particular project through the various departments of the business from inception to completion.

#### Your task is to:

- explain the role of project management and the responsibilities of individual members of the project management team
- explain the concept and importance of time management within the project management team

Your work should be presented as part of a structured report that covers all tasks contained in this document.

## Part 1b: Engineering and the environment.

### Task 3: Clean manufacturing, resource depletion and environmental issues.

---

#### Assessment Criterion 3.1

#### For the sector skill area you have studied your task is to:

- investigate and report upon the issues surrounding clean manufacturing:
  - management of resource depletion
  - the sources of environmental pollution
  - the engineering methods used to control environmental pollution.
  - environmental impact
  - management of the reduction of solid, liquid and hazardous waste

Your work should be presented as part of a structured report that covers all tasks contained in this document.

## Task 4: Environmental Management

---

### Assessment Criterion 4.1

#### Your task is to:

- explain the possible effects of external environmental factors upon an engineering business and how these effects are managed. This should cover the following areas:
  - changes in the environment
    - global warming
    - resource depletion
    - local and global conflicts
  - land management
    - green field and brown field conflict and development
  - water supply

You work should be presented as part of structured report that covers all tasks contained in this document.

## Task 5: Environmental sampling, data collection and analysis

---

### Assessment Criterion 5.1

#### Your task is to:

- undertake an environmental sampling activity, in which you will collect and mathematically analyse an environmental sample such as water, soil or air.

#### You will need to:

- undertake the chemical analysis of water, soil, air and/or other samples taken in different places
- conduct analysis of information and data from research carried out into environmental issues
- clearly present the results.

You work should be presented as part of a structured report that covers all tasks contained in this document.

# Model Assignment: Tutor Information

OCR Level 3 Principal Learning in Engineering

Unit F556: Engineering businesses and the environment

# Guidance for Centres

## 1 General

1.1 OCR model assignments are issued free to participating centres and are also available to download from our website: [www.ocr.org.uk](http://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 20 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.

#### **7 Plagiarism and unauthorised collaboration**

7.1 Centres should have adequate procedures in place to ensure that plagiarism and unauthorised collaboration are identified and responded to.

7.2 When supervising tasks, teachers are expected to:

- offer learners advice about how best to approach such tasks
- inform learners of the ramifications of unfair practice
- exercise continuing supervision of work in order to monitor progress and to prevent plagiarism
- ensure all copied materials is suitably acknowledged
- ensure copied material is not given credit in the assessment process

- 7.3 As with all controlled assessments, the presenter must be satisfied that the work submitted for assessment is the learner's own work.

# Notes for Tutors

## Introduction to the Tasks

---

The tasks have been designed to enable learners to demonstrate their knowledge and understanding of engineering businesses and the environment.

This unit has two parts **1a** and **1b** which have been combined into a single topic.

### **1a: Engineering businesses and career pathways.**

This part of the unit provides the learner with the opportunity to gain knowledge and understanding of a specific business within an engineering sector.

They will consider the organisation of engineering businesses and the influence of external and internal factors which include: career pathways, employee and business registration and regulation, role of project management, contractual arrangements, legislative requirements, and the importance and function of risk assessment.

### **1b: Engineering and the environment.**

This part of the unit provides the learner with the opportunity to gain knowledge and understanding of clean manufacturing, including the sources of environmental pollution and the engineering methods used to control them within a specific engineering sector.

They will examine the problems and possible solutions addressing: resource depletion, air and water pollution control, managing the reduction of solid, liquid and hazardous waste and associated changes in the environment.

They will also consider the problems of the management of changes in the environment, methods of land management and water supply and the associated solutions will also be considered in depth.

Learners will complete the assignment in the form of a structured report in two parts.

#### **Part 1a:** Should contain:

- a description and explanation of an internal business structure
- identification of the different roles within the organisation and their interrelationship within the business and details of different career pathways available in engineering
- details and explanations of the internal and external factors affecting businesses operating within the chosen sector
- analysis of the risks associated with the business
- explanations of the role of project management and the responsibilities of individual members of the project management team
- explanations of the concept and importance of time management within the project management team supported by examples

**Part 1b:** Should contain:

- details, descriptions and evaluations of the environmental issues linked to engineering businesses for air and water contamination and their control, the issues of resource depletion, the management and the reduction of solid, liquid and hazardous waste together with associated changes in the environment
- explanations of the possible effects of a number of external environmental factors and how these are managed within an engineering business
- details of simple chemical analysis of environmental samples and analysis of the data.

Learners will also be able to demonstrate their ability to undertake research activities, collect and mathematically analyse environmental samples.

They will need to individually undertake:

- chemical analysis of water, soil, air and/or other samples taken in different places
- conduct analysis of information and data from research carried out into environmental issues
- clearly present their results.

The model assignment has been designed so that all of the assessment criteria in Unit F556 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.

No changes to the assessment criteria are permitted.

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><b>Task 1</b></p> <p>Types of manufacturing processes and systems</p>	<p>Descriptions and explanations</p> <p>Details of investigation into the roles identified the internal business structure and the career pathways available in engineering</p> <p>Outline details and explanation of the internal and external factors affecting businesses operating within the chosen sector</p> <p>Analysis of the risks associated with the business</p>	<p><b>Assessment Criteria</b></p> <ul style="list-style-type: none"> <li>• 1.1,1.2,1.3,1.4</li> </ul> <p><b>PLTS</b></p> <ul style="list-style-type: none"> <li>• SM4</li> </ul>
<p><b>Task 2</b></p> <p>Project management and responsibilities.</p>	<p>Explanations of the role of project management and responsibilities of individual members together with time management within the project management team</p>	<p><b>Assessment Criteria</b></p> <ul style="list-style-type: none"> <li>• 2.1</li> </ul> <p><b>PLTS</b></p> <ul style="list-style-type: none"> <li>• none</li> </ul>
<p><b>Task 3</b></p> <p>Clean manufacturing, resource depletion, and environmental issues</p>	<p>Descriptions and evaluations of the environmental issues linked to engineering businesses for:</p> <ul style="list-style-type: none"> <li>• air and water contamination and its control</li> <li>• resource depletion</li> <li>• managing the reduction of solid, liquid and hazardous waste</li> <li>• together with associated changes in the environment</li> </ul>	<p><b>Assessment Criteria</b></p> <ul style="list-style-type: none"> <li>• 3.1</li> </ul> <p><b>PLTS</b></p> <ul style="list-style-type: none"> <li>• IE4</li> </ul>

<p><b>Task 4</b></p> <p>Environmental management</p>	<p>Descriptions and evaluations of issues surrounding management of changes in the environmental such as:</p> <ul style="list-style-type: none"> <li>• global warming</li> <li>• resource depletion</li> <li>• local and global conflicts</li> <li>• flood defences</li> <li>• green field and brown field conflict.</li> </ul>	<p><b>Assessment Criteria</b></p> <ul style="list-style-type: none"> <li>• 4.1</li> </ul> <p><b>PLTS</b></p> <ul style="list-style-type: none"> <li>• IE4</li> <li>• IE6</li> <li>• EP2</li> </ul>
<p><b>Task 5</b></p> <p>Environmental sampling, data collection and analysis</p>	<p>Details of:</p> <ul style="list-style-type: none"> <li>• chemical analysis of water soil, air and / or other samples taken in different places</li> <li>• analysis of information and data from research carried out into environmental issues</li> <li>• clearly presented results.</li> </ul> <p>Use of:</p> <p>techniques appropriate to the type of information being presented</p>	<p><b>Assessment Criteria</b></p> <ul style="list-style-type: none"> <li>• 5.1</li> </ul> <p><b>PLTS</b></p> <ul style="list-style-type: none"> <li>• EP3</li> </ul>