

teachers' handbook

Version 2 April 2010



GCSE Engineering

J322 – Single Award
J344 – Double Award

This handbook is designed to accompany the OCR GCSE Engineering specification for teaching from September 2009. This booklet contains the following support materials:

- Subject specific guidance
- Resource list
- Publisher partner resources
- Frequently asked questions
- Other forms of support.

OCR GCSE
ENGINEERING

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Introduction

OCR is offering new GCSEs for first teaching in September 2009.

We've taken this opportunity to improve the quality of our GCSEs for teachers and students alike.

We've made improvements in three key areas: updated and relevant content, a focus on developing students personal, learning and thinking skills, and flexible assessment, so you can choose the best learning approach for the job.

We want to make the introduction of these new GCSEs as easy for you to manage as possible.

The main changes are:

- Controlled assessment will be introduced for most subjects
- The opportunity will be taken to bring course content up to date
- Examinations should provide opportunity for extended writing and more varied question types
- All GCSEs will meet the requirements of the Disability Discrimination Act.

Our approach is to provide consistency across all our GCSEs by offering the flexibility that unitised qualifications bring, allowing teaching and assessment to be either a linear or unitised fashion.

OCR offers a range of support materials, developed following extensive research and consultation with teachers. We've designed them to save you time when preparing for the new specification and to support you while teaching them.

It is important to make the point that this Teacher Handbook plays a secondary role to the specifications themselves. The GCSE Engineering specification is the document on which assessment is based: it specifies what content and skills need to be covered. At all times therefore, the Teacher Handbook should be read in conjunction with the Specification. If clarification on a particular point is sought, then that clarification must be found in the Specification itself.

Subject specific guidance

Unit A622: Engineering Processes

1 hour written examination or computer-based test.

The examination will include a range of different styles of questions and will be designed for students of all abilities. It will require candidates to demonstrate an understanding of the practical application of knowledge related to products and engineering environments they have studied. An example of typical question styles that will be employed is listed below.

Example 1

Questions where the candidate is asked to match things together:

For each product listed below select the correct sector.

Sectors:

Chemical and Processes

Computers, Communication and ICT

Medical and pharmaceutical

Automotive

Product:

Mobile phone

Wheel

Touch Screen TV

Example 2

Questions where the candidate is asked to provide short, open ended answers to questions relating to areas they have studied.

Describe **two** different safety precautions you should take when operating a pillar drill

Precaution 1.....

Precaution 2.....

Example 3

Questions that require candidates to select issues according to their importance:

Tick two items of personal protective equipment (PPE) to be used when operating a machine tool

Goggles

Gloves

Apron

Safety Helmet

Ear plugs

Hair Net

Example 4

Longer, open-ended questions that require the candidate to discuss and/or compare, giving reasons and justification:

Discuss the use of modern technologies on engineered products.

Discuss the importance of client feedback.

Example 5

Questions relating to specific products from an area the candidate has studied:

Tick the correct meaning of the safety sign shown below



Eye protection must be worn

Ear protection must be worn

Danger Area

Industrial vehicles

Unit A624: Impact of modern technologies on Engineering

1 hour written examination or computer-based test.

The examination will include a range of different styles of questions and will be designed for students of all abilities. It will require candidates to demonstrate an understanding of the practical application of knowledge related to products and engineering environments they have studied. In particular, they should focus on designing products for manufacture and sustainability. An example of typical question styles that will be employed is listed below.

Example 1

Questions where the candidate is asked to match things together:

For each products listed below select the correct sector in which it is made.

Sectors:

Chemical and Processes

Computers, Communication and ICT

Medical and pharmaceutical

Automotive

Product:

Mobile phone

Wheel

Touch Screen TV

Example 2

Questions where the candidate is asked to provide short, open ended answers to questions relating to areas they have studied.

Describe **two** benefits of computer aided design (CAD).

Benefit 1:

Benefit 2:

Example 3

Questions that require candidates to analyse information and answer questions.

The chart shows the amount of waste produced when engineering a product. Tick the correct answer to show whether each of the following statements are true.

More waste comes from design than production

More waste comes from distribution than design

More waste comes from production than from use

Example 4

Longer, open-ended questions that require the candidate to discuss and/or compare, giving reasons and justification:

Discuss the use of CAD when designing engineered products.

Discuss the need for effective personal protective equipment (PPE) in an engineering environment.

Example 5

Questions relating to specific products from an area the candidate has studied:

Tick one of the following products which you will use to answer the following questions.

Turbine

Wheelchair

Road Bridge

Mobile phone

Car seat

For the selected product name a material that can be used

Describe one benefit of that material

Resources

Useful Reference Books

Dept. for Education and Skills Great Britain and Centre for Education and Industry University of Warwick (2005) Engineering for Education and Skills 1845721098

Engineering GCSE by Mike Tooley BA; Advanced Technological and Higher National Certificates Kingston University (Paperback - 18 May 2005)

Engineering GCSE Curriculum Support Pack by Mike Tooley BA; Advanced Technological and Higher National Certificates Kingston University (Ring-bound - 23 Dec 2003)

GCSE Engineering by Steve Wallis and Neil Godfrey (Paperback - 27 Sep 2004)

GCSE Engineering by Steve Cushing (Paperback - 29 Oct 2004)

OCR Engineering for GCSE by John Hill (CD-ROM - 26 Jun 2009)

Hodder Education Design & Technology ISBN 978-0-340-96634-1

www.engineering.com/Videos/tabid/4624/Default.aspx

www.mechanicalengineering.tv/

<http://videos.howstuffworks.com/science/engineering-videos.htm>

www.teachers.tv/engineering

Other useful Websites

www.engsc.ac.uk/er/index.asp

www.raeng.org.uk/education/default.htm

www.engineeringtoolbox.com

www.gcseinengineering.com

www.youngeng.org

www.semta.org.uk

www.ccea.org.uk/engineering

Engineering Resources, LSDA,
www.excellencegateway.org.uk/page.aspx?o=131338

Useful General Material

OCR Website, www.ocr.org.uk

OCR micro-site, www.gcsechanges.com

Customer Contact Centre (General) Tel: 01223 553998 Fax: 01223 552627

www.bbc.co.uk/schools/gcsebitesize/ (Revision Guide)

Other forms of Support

In order to help you implement the new GCSE Engineering Specification effectively, OCR offers a comprehensive package of support. This includes:

Published Resources

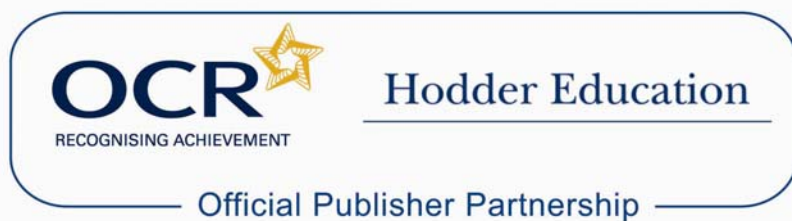
OCR offers centres a wealth of quality published support with a fantastic choice of 'Official Publisher Partner' and 'Approved Publication' resources, all endorsed by OCR for use with OCR specifications.

Publisher partners

OCR works in close collaboration with three Publisher Partners; Hodder Education, Heinemann and Oxford University Press (OUP) to ensure centres have access to:

- Better published support, available when you need it, tailored to OCR specifications
- Quality resources produced in consultation with OCR subject teams, which are linked to OCR's teacher support materials
- More resources for specifications with lower candidate entries
- Materials that are subject to a thorough quality assurance process to achieve endorsement

Hodder Education is the publisher partner for OCR GCSE Engineering.



Approved Publications

OCR still endorses other publisher materials, which undergo a thorough quality assurance process to achieve endorsement. By offering a choice of endorsed materials, centres can be assured of quality support for all OCR qualifications.



Endorsement

OCR endorses a range of publisher materials to provide quality support for centres delivering its qualifications. You can be confident that materials branded with OCR's "Official Publishing Partner" or "Approved publication" logos have undergone a thorough quality assurance process to achieve endorsement. All responsibility for the content of the publisher's materials rests with the publisher.

These endorsements do not mean that the materials are the only suitable resources available or necessary to achieve an OCR qualification. Any resource lists which are produced by OCR shall include a range of appropriate texts.

OCR Training

A full range of training events provide valuable support, for the delivery and assessment of OCR qualifications:

Get Ready...

An overview of new OCR specifications

Get Started...

For teachers preparing to deliver or already delivering OCR specifications

Get Ahead...

For teachers wanting to improve delivery and assessment of a current OCR specification

Lead the way...

To encourage creativity and innovation

View up-to-date event details and make online bookings at www.ocreventbooker.org.uk or view our new training e-books at www.ocr.org.uk/training. If you are unable to find what you are looking for contact us by e-mail training@ocr.org.uk or telephone 02476 496398.

e-Communities

Over 70 e-Communities offer you a fast, dynamic communication channel to make contact with other subject specialists. Our online mailing list covers a wide range of subjects and enables you to share knowledge and views via email.

Visit <https://community.ocr.org.uk>, choose your community and join the discussion!

Interchange

OCR Interchange has been developed to help you to carry out day to day administration functions online, quickly and easily. The site allows you to register and enter candidates online. In addition, you can gain immediate a free access to candidate information at you convenience. Sign up at <https://interchange.ocr.org.uk>

Frequently Asked Questions

A621 A/B: Study of an Engineered Product and Engineering a Product

Can I make anything I like?

No, you have to respond to one of the given Customer Design Briefs provided by OCR. You select a brief, come up with a solution and then make the solution.

Can I make what someone else has designed?

No. You have to come up with the idea or solution yourself.

Can I make it and then do the folio?

No. you have to do things in the correct order. If you don't then you will not be able to gain all the marks available.

How do I know what I have to do to get good marks?

Your teacher will explain everything as you go along. Also the "Assessment Criteria" are printed in the specification on page 55 and 56

Can I submit part 1A of this unit at a different time to part 1B?

No, you have to submit them both at the same time.

Can I link part 1A of this unit to part 1B of this unit?

Yes. But it will depend on the product you look at for part 1A and the customer brief you select in Part 1B.

Can I do work at home for this unit?

Yes and No. All the work you **submit for assessment** has to be undertaken in what is called "Controlled Conditions". This means your teacher should supervise you for all of your work that you submit for assessment. However, there is nothing to stop you practising at home and improving your skills so that when you do them with your teacher they are the best you can possibly achieve.

Can I take as long as I like making something?

No, there is a time limit to your Controlled Assessment for this unit and it is suggested that you spend about 6 hours on part 1A and 14 on part 1B

Will I have homework to do?

Yes. Homework is a very effective way of helping to learn and remember things.

Can I do homework as part of my folio?

No. Homework is great, but only to support your learning. It cannot be submitted as evidence for your assessment.

Can I work as part of a team and make something jointly with my friend.

Yes and No. You must have your own folio containing your own evidence of designing, making and evaluation for the work you submit for assessment.

But, your teacher may allow you to undertake group work or work in pairs during your course on work which is **not** submitted for assessment.

Will I have every lesson to do the folio work?

No. There is a strict time limit set and you must not exceed this. You might do it bit by bit so that it spans a period of time but your actual working time is limited to 20 hours for this unit and around 14 hours for 1B.

Can I get help from my parents?

Yes. You can always ask your parents to explain and show you things **but** the work you submit for assessment must be all your own.

Can my folio be done using ICT?

Yes. There are several ways you can do this and your teacher will explain them all to you.

Can I share work with other people?

A difficult one. Sharing when you are learning is really important and a brilliant thing to do. You can explain things to others and also learn from them **but** you cannot share anything when you are doing your controlled assessment. Your folio that has your designing, evidence of your making and your evaluation in it has to be your very own work.

What if someone copies my work?

You need to be very careful about letting anyone copy your work. It can be difficult to decide who's work is the original work and both of you could be penalised.

Will I have chance to practise things before I do my designing and making?

Yes. The "Controlled Assessment" is only a small part of your Engineering course. You will be given lots of new information, shown new skills and be able to practice them before you start your folio.

What is "Controlled Assessment"?

Controlled Assessment has replaced coursework. There are now tighter "controls" on the work you do and the evidence you submit to OCR for assessment.

If I don't do very well can I redo the folio?

Yes. But even better than that you can "re-sit" the unit and just improve your folio rather than start all over again.

If I did a re-sit and my marks were worse the 2nd time would I lose out?

In the case of a re-sit your best mark will count, as long as the Terminal Rule has been satisfied.

What is coursework?

Coursework has changed its name and the rules are much tighter now. You still do the work "during your course" but the way in which you do it has to be "controlled" more tightly now and so it is called "Controlled Assessment"

Can I submit my folio for assessment in year 10?

Yes. You can submit work whenever you like (in what is called the January or June examination windows). **But** you will always be assessed using the National Standards expected to be achieved by someone at the end of year 11.

I'm doing the Single Award GCSE Engineering - can I do A621 and A624?

No. If you are just doing the single award you must do A621 and A622

I am doing the Double Award in Engineering - can I do A624 first?

Yes. You can do the units in any order **but** you must be entered for at least **two** of them at the end of your course.

I am doing Engineering and Manufacturing can I submit the same work for both.

No. Apart from B231 1A, all the units are so different anyway that the work would not be suitable for assessment for a different qualification. But even if some bits were suitable you are not allowed to submit it for two different qualifications.

If you do the 1st unit A621 1A and A621 1B Engineering and B231 1A and B231 1B Manufacturing you **must** choose different products and customer briefs.

What does “Plagiarism” mean?

Plagiarism is when work is copied from someone else or from another source for example the internet. If you submit work which has been plagiarised you could get disqualified from the Engineering examination completely. In serious cases you could be disqualified from **all** of your GCSE examinations.

If I needed some welding done and my school does not have the facilities can I get it done elsewhere?

Yes. This often happens **but** you must declare this very clearly in your portfolio giving full details of what has been done and by whom. You cannot be given credit for the welding (or any other process in similar circumstances) and must not expect it. But it may enable you to get the other parts of your making completed.

I am not very good at finishing things off. Will I fail if my product is not finished?

No. Not necessarily. You will gain some credit but you will obviously not gain as many marks for incomplete work.

What happens if I am ill and cannot complete my folio?

If you are seriously ill and have a doctor's note the examination boards have different procedures to take this into account and you could still get your qualification. But if you just miss time from school or don't turn up to lessons that will not count and you will lose out.

What happens if I change schools during my course?

Your work can be submitted by your new school even if they do not teach OCR Engineering. You will need to make sure that your new school knows the details of the specification you have been studying and that they have proof that all the work is your own. Your teacher from your old school would normally send your work to your new school with a covering note.

I started studying for the Double Award but I have fallen behind. Can I be entered for the Single Award instead?

Yes. This is possible providing you have work for A621A and A621B and take the written examination A622. None of the work you have done for A623 or A624 will be of use to you if this happens.

A622/A624: Engineering Processes and the Impact of Modern Technologies on Engineering

How do I know what I have to do to get good marks?

Your teacher will explain everything as you go along. Good general advice is to always ensure you carefully read the examination question and make sure you answer what is being asked for.

Can I do work at home for this unit?

Yes. In fact you may well do much better in the final examination if you spend some time at home carefully reading through what you have been taught.

How many examinations will I have to do?

You will have to sit one examination for the single Award and two examinations for the Double Award.

How long is the exam

Each examination lasts 1 hour.

Will I have homework to do?

Yes. Homework is a very effective way of helping to learn and remember things.

Can I get help from my parents?

Yes. You can always ask your parents to explain and show you things

Can my folio be done using ICT?

Yes. There are several ways you can do this and your teacher will explain them all to you.

What is the “Computer Based Test”?

Instead of sitting a written paper you can do the examination on-line. Your teacher will be able to explain more about this and will be able to tell you if your school has the facilities to allow you to take the exam in this way.

If I don't do very well can I redo the exam?

Yes.

If I did a re-sit and my marks were worse the 2nd time would I lose out?

In the case of a re-sit your best mark will count, as long as the Terminal Rule has been satisfied.

Can I sit the examination in year 10?

Yes. You can sit the exam whenever you like (in what is called the January or June examination windows). **But** you will always be assessed using the National Standards expected to be achieved by someone at the end of year 11.

I'm doing the Single Award GCSE Engineering - can I do A621 and A624?

No. If you are just doing the single award you must do A621 and A622.

Am doing the Double Award in Engineering - can I do A624 first?

Yes. You can do the units in any order **but** you must be entered for at least **two** of them at the end of your course.

What happens if I am ill and cannot take the exam?

If you are seriously ill and have a doctor's note the examination boards have different procedures to take this into account and you could still get your qualification. But if you just miss time from school or don't turn up to lessons that will not count and you will lose out.

What happens if I change schools during my course?

You can be entered for the exam by your new school even if they do not teach OCR Engineering. You will need to make sure that your new school knows the details of the specification you have been studying. Your teacher from your old school would normally send your work to your new school with a covering note.

I started studying for the Double Award but I have fallen behind. Can I be entered for the Single Award instead?

Yes. This is possible providing you have work for B231A and B231B and take the written examination A622. None of the work you have done for A623 or A624 will count if this happens.

How much should I write for each question?

It is not possible to give an exact answer for this. Generally speaking, the amount you write should be based on the marks available. These are shown in [square brackets] at the end of the question.

Q Will I lose marks for bad spelling?

Your quality of written communication will be assessed where indicated. This will include your spelling, punctuation and grammar, appropriate use of terminology and structure.

Engineering J344: Real World Engineering and Making an Engineered Product A623 A/B

Can I make anything I like?

No, you have to respond to one of the given Products from a list provided by OCR.

Can I make what someone else has designed?

No. You have to come up with the idea or solution yourself.

Can I make it and then do the folio?

No. you have to do things in the correct order. If you don't then you will not be able to gain all the marks available.

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www.ocr.org.uk

OCR customer contact centre

General qualifications

Telephone 01223 553998

Facsimile 01223 552627

Email general.qualifications@ocr.org.uk

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