Design and Technology

GCSE 2012

D&T: Electronics and Control Systems

Teachers' Handbook

J301

Version 1

September 2012

www.ocr.org.uk/gcse2012

OCR

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INTRODUCTION

OCR's GCSE in Design and Technology: Electronics and Control Systems entered first teaching in September 2009.

We have improved the quality of our GCSEs for teachers and students alike. We've made improvements in two key areas: updated and relevant content and a focus on developing students' personal, learning and thinking skills.

In addition and in response to reforms announced by the Government and in response to Ofqual mandated changes to GCSEs, unitised assessment of this qualification is being replaced by linear assessment from September 2012. This means that candidates commencing a two year course from September 2012 will take all of their GCSE units at the end of the course in June 2014.

The main changes are:

- Controlled assessment and examinations will be summative
- Examinations provide opportunity for extended writing and more varied question types
- All GCSEs will meet the requirements of the Equality Act.

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 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 Design and Technology: Electronics and Control Systems 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

This document is designed to support delivery of GCSE Design and Technology: Electronic and Control Systems (J301). We hope you will find it useful in planning your delivery and assessment opportunities.

There are three units available for Design and Technology: Electronic and Control Systems. They are:

- Unit A511: Introduction to designing and making
- Unit A513: Making quality products
- Unit A515: Sustainability and the technical aspects of designing and making

  01 Electronics
  02 Pneumatics
  03 Mechanisms

Only one of these three options is needed to attain the qualification.

These documents do not seek to prescribe how the subject should be delivered. They merely seek to show the breadth and range of learning opportunities within this subject area. We hope centres will use these as a starting point for developing inspiring and innovative courses that meet the needs of their students.

UNIT A515: SUSTAINABILITY AND THE TECHNICAL ASPECTS OF DESIGNING AND MAKING

There will be three question papers, one each for electronics, mechanisms and pneumatics. Candidates will choose one paper, corresponding to their chosen subject. Each paper will contain two sections. Section A will be generic across the three papers; Section B will be unique to the chosen subject.

This unit aims to develop a candidate's knowledge and understanding of sustainability, environmental concerns, cultural, moral and social issues. Candidates will look at how Design and Technology has evolved through examination of the products from the past and present. Candidates need to consider how future designs will impact on the world in which we live. They will need to study examples of both old and new products in order that they gain awareness and understanding of recent trends and innovations in design and production, labelling, packaging and the impact that the design of such products is having on the environment, society and the economy.

Candidates will need to consider how future designs/ products will impact on the world in which we live. By looking at old and new products candidates will gain awareness and understanding of trends and innovations in design and manufacture, labeling, packaging and the impact that the design of such products is having on the environment, society and the economy.

Moral, cultural, economic, environmental and sustainability issues are inherent in design and technology.

The unit focuses on:

- Consideration of products
- Consideration of the environment
- Consideration of society and the economy
- Working with tools and materials
- Selecting processes
- Designing for success

The paper consists of questions that focus on sustainability and technical aspects of design and making.

- 80 marks
- 40% of the total GCSE marks
- 1 hour 30 minutes written paper

Section A consists of 15 short answer questions and one question which may involve sketching, annotation, short sentences and extended writing. This section will focus on sustainability, product analysis and design.

Section B consists of three questions which may involve sketching, annotation, short sentences and extended writing. This section will focus on the technical aspects

of working with materials, tools and equipment and design of products.

This unit will be externally assessed.

BANDED MARK SCHEME

On the unit A522 examination papers there will be one question where the marking will be banded marking. The questions will have * by the number to show this. This is the academic rigor of the examination paper and will differentiate between the lower and higher attaining candidates.

Its advantage is the all candidates will be able to achieve some marks on those questions but to achieve highly the candidates will need to put some depth and detail into their answers and show a thorough understanding of the topic.

In the specimen examples on the OCR website there is one example:

Question

The Government are concerned about the health of the nation. Discuss how manufacturers have responded to this

Answer guidelines:

Level 1 (0-2 marks)
Basic discussion, if candidates only write in point form a maximum of 2 marks should be awarded, showing some understanding of how manufacturers have responded to Government concerns about the health of the nation. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling

Level 2 (3-5 marks)
Adequate discussion, showing an understanding of how manufacturers have responded to Government concerns about the health of the nation. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, grammar and punctuation

Level 3 (6-7 marks)
Thorough discussion, showing a clear understanding of how manufacturers have responded to Government concerns about the health of the nation. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar.

On the SAMs mark scheme there are details of the type of areas it is expected the candidates will discuss.

0 marks = no response worthy of credit

RESOURCES

UNIT A515: SUSTAINABILITY AND THE TECHNICAL ASPECTS OF DESIGNING AND MAKING

Electronics and Control Systems Technology for GCSE Hodder Education ISBN 978 0340 98196 2. This book has been specifically written to match this specification by principal examiners for GCSE.

The Sustainability Handbook for Design & Technology Teachers Practical Action Publishing ISBN 978-1- 85339-670-0. An excellent teacher resource.

Experimental Eco Design Rotovision
ISBN 2-88046-817-5

www.practicalaction.org/?id=resources_catalogue

www.recycle-more.co.uk

www.wasteonline.org.uk

www.carbonfootprint.co.uk

www.sda-uk.org

www.pumpkintv.co.uk

www.recyclezone.org.uk

www.nitinol.com

www.aeronutz.flyer.co.uk

www.doctronics.co.uk

www.totalrobots.com

www.mutr.co.uk

www.theiet.org/education

www.secondarydandt.org

www.technologystudent.com

OTHER FORMS OF SUPPORT

In order to help you implement the new GCSE Design and Technology: Electronics and Control Systems 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 Design and Technology: Electronics and Control Systems.

Hodder Education has produced the following resources for OCR GCSE Design and Technology: Electronics and Control

OCR Electronics and Control Systems for GCSE Student's Book
Terry Bream, John Drury, Editor Bob White
ISBN: 978 0340 98201 3
Published: 25/09/2009

OCR Design and Technology for GCSE –Teachers DVD
Chris Walker
ISBN: 978 0340 98203 7
Published: 27/11/2009

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.

PROFESSIONAL DEVELOPMENT

The 2012-13 OCR Professional Development Programme offers more accessible and more cost effective training, with the same valued content that you expect from us.

At OCR, we are constantly looking for ways in which we can improve the support we offer to teachers. Most recently we have been considering the increasing challenges that schools face in releasing teachers for INSET, and how OCR can make its professional development programme more accessible and convenient for all.

From September 2012, our new improved programme will include:

- FREE online professional development units available when and where you want them
- FREE live web broadcasts of professional development events
- FREE face to face training for GCSE controlled assessment and GCE coursework
- A series of 'not to be missed' premier professional development events.

For more information, please email training@ocr.org.uk or visit www.ocr.org.uk/training.

OCR SOCIAL

Visit our social media site (http://www.social.ocr.org.uk). By registering you will have free access to a dedicated platform where teachers can engage with each other - and OCR - to share best practice, offer guidance and access a range of support materials produced by other teachers; such as lesson plans, presentations, videos and links to other helpful sites.

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 and free access to candidate information at your convenience. Sign up at https://interchange.ocr.org.uk

FREQUENTLY ASKED QUESTIONS

UNIT A511: INTRODUCTION TO DESIGNING AND MAKING

Is this a compulsory unit?
This unit is compulsory for a GCSE in Design and Technology: Electronics and Control Systems (J301).

What is this unit worth?
This unit is worth 30% of the GCSE in Design and Technology: Electronics and Control Systems (J301) qualification.

What is the entry code for this unit?
The entry code for this unit is A511.

How is this unit assessed?
The unit is assessed by a 20 hour controlled assessment test. This unit is internally marked and externally moderated. Teachers should use the published marking criteria for Unit A511. Moderation is carried out postally or via the OCR Repository.

Will candidates be able to re-enter units?
Yes. Controlled assessment units can be carried forward with the moderator mark from one session to the next i.e. June 2014 to June 2015. There is a separate 'carry over' code to re-enter the unit.

Is there a text book for this unit?
Yes. The recommended text book is GCSE Design and Technology: Electronics and Control Systems published by Hodder. This book covers all three units of the GCSE in Design and Technology: Electronic and Control Systems (J301) qualification and the two units required for a GCSE (Short course) in Design and Technology: Electronic and Control Systems (J041).

UNIT A513: MAKING QUALITY PRODUCTS

Is this a compulsory unit?
This unit is compulsory for a GCSE in Design and Technology: Electronics and Control Systems (J301).

What is this unit worth?
This unit is worth 30% of the GCSE in Design and Technology: Electronics and Control Systems (J301) qualification.

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What is the entry code for this unit?
The entry code for this unit is A523.

How is this unit assessed?
This unit is assessed by a 20 hour controlled assessment task.

Is this unit assessed by a visiting moderator?
No. Candidates are required to take a minimum of two clear photographs of the product, which must be included in the design folder. The moderator will then request a sample of folders. Moderation is carried out postally or via the OCR Repository.

UNIT A515: TECHNICAL ASPECTS OF DESIGNING AND MAKING

Is this a compulsory unit?
This unit is worth 40% of the GCSE in Design and Technology: Electronics and Control Systems (J301).

What is this unit worth?
This unit is worth 40% of the GCSE in Design and Technology: Electronics and Control Systems (J301) qualification.

What is the entry code for this unit?
The entry code for this unit is A515.

How is this unit assessed?
This unit is assessed by a 90 minute written test. The test is externally set and marked.

I understand that some questions are marked by banded marking. What is that?
There will be one banded response part of a question – worth 6 marks. Marks are awarded for the level of communication. The advantage of this is that all candidates should be able to attain some marks in their answer.

How do my candidates know that the question is marked by banded response?
The question number has an asterisk by it. Eg 5 (b*).

Do I have to teach this as a separate unit to the rest of the specification?
It is up to you how you organize the teaching of the specification; however the candidates need to be clear what they will be examined on in the examination. This is very clear in the specification.

Issues relating to sustainability are constantly changing will this be reflected in the exam?
The candidates can only be examined on what is in the specification however the terms used in the specification are broad and teachers will need to keep up to date with developments as you have done in the past.

Is the test tiered?
No. All candidates take the same test.

Are exemplar test questions available?
Yes. Exemplar questions are available on the OCR website and past test papers will also be made available on the website.

Is there a text book for this unit?
Yes. The recommended text book is GCSE Deisgn and Technology:Electronics and Control Systems textbook published by Hodder.

Contact us

Keep up to date with the latest news by registering to receive e-alerts at **www.ocr.org.uk/updates**

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