



Design & Technology, Engineering and Food Preparation & Nutrition

NEW
OCR Engineering Design
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Dear friends and colleagues

This year, we have started to develop support for the emerging and increasingly popular Engineering courses, starting with OCR Engineering Design. A complete suite of resources, developed with experienced examiners and moderators will be published throughout the autumn of 2024 to support teachers and students, spec point by spec point.

Our ClearRevise® series launched in the summer of 2020 and has grown since then to over 50 titles covering most of the popular GCSE and KS4 choices.

This year, we have added further support for Business, Languages, PE, History and English. In addition, the sister series, Exam Tutor, has also grown to include D&T and a popular new KS3 Computing workbook. The guides provide a more accessible and approachable revision experience, with examination-style questions, model answers and specification transparency at their heart.

I hope we can continue to support you, your department and students throughout the next academic year.



NEW: OCR Engineering Design J822, see page 4.





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Exam**Tutor** GCSE Design and Technology 8552 -

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OCR Engineering Design J822

Each unit covers a single Topic Area of the R038 mandatory externally assessed unit.

Each unit contains a **FREE** lesson which can be downloaded from our website.

Get in touch to order your units

R038 Topic Area 1 Designing processes

This pack covers Topic Area 1 of Unit R038

The first lesson introduces a range of design strategies that different projects may adopt, before looking at how different market research techniques can be used to develop a design brief in lesson 2. Lesson 3 uses the ACCESS FM acronym to evaluate new and existing products. The next lesson begins to analyse a design brief with reference to sketching and modelling. In the final lesson of the unit, students are introduced to testing designs using physical and virtual modelling techniques. Each lesson may be spread over more than one school lesson, especially if time is spent in the lessons doing exercises and going over homework tasks.

FREE LESSON Lesson 1 Design strategies

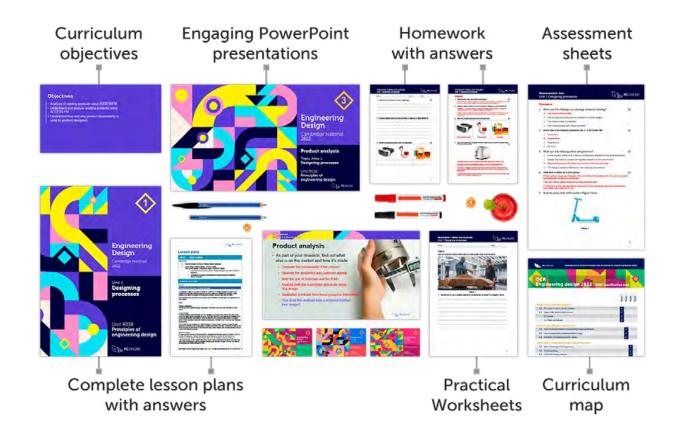
Lesson 2 Research techniques

Lesson 3 Product analysis

Lesson 4 Generating design ideas

Lesson 5 Make and evaluate

Assessment



R038 Topic Area 2 Design requirements

This pack covers Topic Area 2 of Unit R038.

The first lesson in this unit covers the wants and needs of different users. Product criteria are also assessed with reasons based on the ACCESS FM mnemonic. Lesson 2 looks at the different manufacturing considerations including the scale of production and availability of materials and components. Lessons 3 and 4 examine a selection of manufacturing processes and techniques, with consideration of product costs. The penultimate lesson looks at the influence of legislation, manufacturing standards and market forces on design and production. Lastly, the 6Rs are covered along with design for the circular economy.

Coming Autumn 2024

Lesson 1 Engineering design specification

Lesson 2 Manufacturing considerations

Lesson 3 Manufacturing processes

Lesson 4 Finishing and assembly

Lesson 5 Design influences

Lesson 6 Sustainable design

Assessment

R038 Topic Area 3 Communicating design outcomes

This pack will cover Topic Area 3 of Unit R038.

The first two lessons focus on drawing types with practice at converting between common types. Flowcharts are explored in the third lesson along with block, circuit and wiring diagrams, including the use of breadboarding. Lesson 4 examines how British Standard conventions are applied to engineering drawings including dimensions and surface finishes. Finally, students will look at how to represent various mechanical features in their drawings as well as understanding and applying common abbreviation and line types including projection lines and hidden detail.

Coming Autumn 2024

Lesson 1 Freehand sketching, oblique and isometric

Lesson 2 Orthographic, exploded and assembly

Lesson 3 Block, circuit and wiring diagrams

Lesson 4 Standard conventions

Lesson 5 Line types, features and abbreviations

Assessment

R038 Topic Area 4 Evaluating design ideas

This pack will cover Topic Area 4 of Unit R038.

Lesson 1 begins by looking at the methods of evaluating data before moving into traditional and modern modelling methods in Lessons 2 and 3. Methods of evaluating a design outcome are covered in Lesson 4.

Coming Autumn 2024

Lesson 1 Methods of evaluating design ideas

Lesson 2 Traditional modelling methods

Lesson 3 Modern modelling methods

Lesson 4 Methods of evaluating a design outcome

Assessment



Students are easily able to consolidate their class learning during homework exercises, as the tasks have been created to link with the class worksheets, which aid independent understanding.

KS3 National Curriculum Map

>

Design and Technology Units

The KS3 series of units has been written to satisfy the new National Curriculum for Design and Technology.

We recommend that, where possible, each NC requirement is covered by two or more units to ensure full coverage.

C	overed by two or more units to ensure full coverage.
Design	Use research and exploration, such as the study of different cultures, to identify and understand user needs
	Identify and solve their own design problems and understand how to reformulate problems given to them
	Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
	Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses
	Develop and communicate design ideas using annotated sketches, detailed plans, 3D and mathematical modelling, oral and digital presentations and computer-based tools
Make	Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
	Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties
Evaluate	Investigate new and emerging technologies
	Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
	Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists
Technical knowledge	Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
	Understand how more advanced mechanical systems used in their products enable changes in movement and force
	Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
	Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]

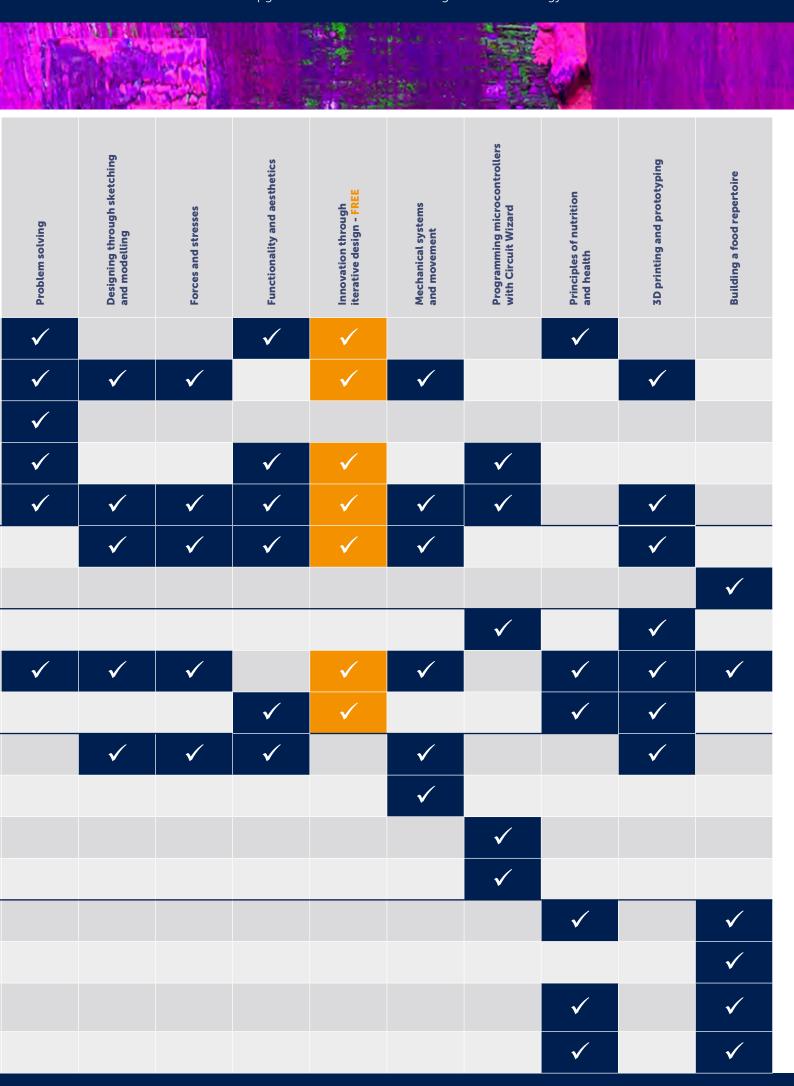
Understand and apply the principles of nutrition and health

Cooking and nutrition

Cook a repertoire of predominantly savoury dishes, understand how to plan a meal for a healthy and varied diet

Become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes]

Understand the source, seasonality and characteristics of a broad range of ingredients



Key Stage 3 Design and Technology

£120 + VAT

Each unit is intended to cover specific parts of the KS3 curriculum, with a supporting introduction to the new theory topics at GCSE.

The units are designed for teaching at any point in KS3 depending on class ability and prior learning. Each unit contains a **FREE** lesson which can be downloaded from our website.

Get in touch to order your units

In partnership with:

We are delighted to bring you a free teaching unit to inspire and engage students to follow a career in D&T



Innovation through iterative design - FREE Unit

We have teamed up with the **Design Museum** to produce a series of six lessons that allow students to experience the freedom of a truly iterative approach to designing. While reducing the rigid structure of a linear design approach, this unit adds enough scaffolding and idea-generating suggestions to enable innovation and inspiration to flow freely. Students are encouraged to design and model in a way that suits them best, using strategies that work to avoid design fixation, resulting in inspiring outcomes.

Lesson 1 Identify design context

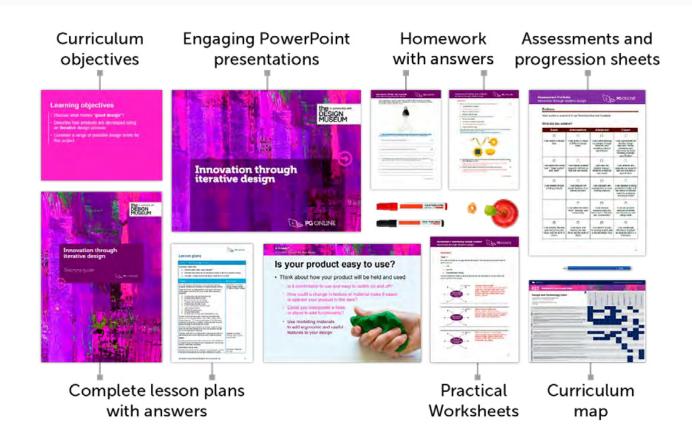
Lesson 2 Model, test, evaluate

Lesson 3 Prototype

Lesson 4 Develop, test, evaluate

Lesson 5 Is it ready?

Lesson 6 Present your progress



Mechanical systems and movement

This theory based unit uses practical activities to reinforce technical principles. Working from basic forms of motion, the lessons slowly build in complexity culminating in a 'design and make' activity that will support understanding of KS4 concepts in relation to mechanical systems. Cams and followers, gears and pulleys are used to create specific movements. Elements of mathematics and science are covered in an accessible and logical way allowing calculations and performance of systems to be predicted.



Significant parts of this unit can be taught without computers or access to a workshop.

FREE LESSON Lesson 1 Motion and movement

Lesson 2 Cams and followers

Lesson 3 Gear trains, pulleys and drive mechanisms

Lesson 4 Card-based automaton - DMA pt1

Lesson 5 Card-based automaton - DMA pt2

Lesson 6 Teambuilding and collaborative design

Designing through sketching and modelling

This hands-on unit follows a series of easy-to-follow tasks that develop students' drawing and modelling skills. The unit moves quickly from basic to advanced drawing and modelling activities offering an easily extendable variety of skills based lessons. Students are encouraged to work out which is the most appropriate format to use for specific tasks. The unit concludes in the development of CAD models using freely available software.



Significant parts of this unit can be taught without computers or access to a workshop.

Lesson 1 2D and 3D sketching skills Lesson 2 Turning 2D into 3D

FREE LESSON

Lesson 3 Perspective and technical drawing

Lesson 4 Physical modelling Lesson 5 3D CAD modelling Lesson 6 SketchUp project

Forces and stresses

This dynamic unit fuses mathematical content with physics based solutions to create a series of predominately practical investigations that deliver theory in a fun and interactive way. It encourages problem solving and teamwork as well as planning and budgeting. The lessons work through basic stresses and forces before looking at solutions through the manipulation of materials. A team challenge is set which leads to destructive testing in a competitive environment.



Significant parts of this unit can be taught without computers or access to a workshop.

Lesson 1 Understanding forces and stresses

Lesson 2 Reinforcing and stiffening

FREE LESSON Lesson 3 Structures and strength

Lesson 4 Bridge building challenge

Lesson 5 Testing and evaluation

Lesson 6 Material properties





Students are easily able to consolidate their class learning during homework exercises, as the tasks have been created to link with the class worksheets, which aid independent understanding.

3D printing and prototyping

This unit examines the impact and technical processes of 3D printing in society and in the classroom before building CAD skills to design 3D components. A practical problem-solving approach to creating connecting parts for a structure is encouraged using techniques demonstrated throughout the unit. Finally, pupils are encouraged to critically review and analyse their successes or failures to inform future design decisions.

> Lesson 1 Introduction to 3D printing FREE LESSON Lesson 2 Understanding 3D printing **Lesson 3 Designing components** Lesson 4 CAD modelling **Lesson 5 Making structures** Lesson 6 Developing skills

Programming microcontrollers with Circuit Wizard

This unit demonstrates effective use of microcontrollers to perform fun and exciting tasks. The straightforward control of light and sound output leads logically on to more involved challenges including time delays and counting devices. Using Circuit Wizard*, simple flowchartbased operations allow for detailed functionality and adaptability. This unit is designed as a starting point for understanding the concept of controlling programmable embedded electronics into D&T products and prototypes.

Lesson 1 Circuit construction principles FREE LESSON Lesson 2 Using feedback to control a system

Lesson 3 Developing delays and timing systems

* Circuit Wizard software and Genie 08M boards are required for this unit.

Lesson 4 Counters Lesson 5 Embedding music Lesson 6 Problem solving using microcontrollers

Problem solving

This unit enables students to understand how products are created to solve users' needs and wants. It is set in a context that ensures empathy is used to realise that everybody is different and may have very specific requirements. Starting with product analysis, students are taught to question form, function and accessibility in order to decide on design criteria in the form of a specification. Through practical activities, students experience physical restrictions allowing them to empathise with disabled users, arming them with motivation to design and make innovative prototypes using iterative design. Reflection and critical evaluation are encouraged throughout the unit.

Lesson 1 Identifying users' needs and wants **Lesson 2 Specification development** Lesson 3 Design for the disabled

Lesson 4 Problem solving - DMA pt1 FREE LESSON Lesson 5 Personalised design - DMA pt2 Lesson 6 Critical evaluation



Excellent resources and value for money. A lifesaver for me and also for my new member of staff who is a non-specialist.

Functionality and aesthetics

Form and function are brought to life through a series of lessons which look at the roles that nature plays in the design of the built environment. Students are encouraged to find inspiration from natural forms to stimulate design proposals, creating both drawn and physical outcomes. Biomimicry is used to convey theory based on science, mathematics and art. The use of digital media is encouraged throughout to assist folio generation and to present a proposal for further evaluation.



Significant parts of this unit can be taught without computers or access to a workshop.

FREE LESSON Lesson 1 Product comparison

Lesson 2 Natural structures and systems

Lesson 3 Organic architecture

Lesson 4 Finding and using geometric shapes in nature

Lesson 5 Constructing naturally inspired forms

Lesson 6 Presentation of ideas and concepts

KS3 Food teaching units The perfect foundation for **GCSE Food Preparation and Nutrition**

Principles of nutrition and health

Understanding basic dietary requirements and what constitutes a healthy meal is at the core of this discrete unit. It has been designed so that it can be delivered in a regular non-specialist classroom, however if access to specialist facilities is available it will complement their use too. The lessons balance current thinking from NHS recommendations with inspiring and occasionally shocking statistics that provide a factual basis for understanding our nutritional needs. Delivered as a fun series of tasks and challenges, students will be better informed to make personal dietary choices.



Lesson 1 Basic nutrition and dietary requirements

Lesson 2 Food sources, provenance and sustainability

Lesson 3 Food for everyone

Lesson 4 Taste testing

Lesson 5 A healthy lunch

Lesson 6 How much is too much sugar?

Building a food repertoire

This unit enables pupils to build a repertoire of primarily savoury dishes whilst learning about traditional dishes. The course is delivered with an underpinning ethos of experimentation and acceptance of diversity in food culture. The importance of foodwaste management is covered throughout encouraging meal planning and other strategies.

The last lessons in the unit set-up the skills for designing and planning meals and include a reflective self-evaluation process so that pupils can become increasingly proficient at creating their own repertoire. Numerous suggestions and recipes for an additional half-term of practical lessons are also included in this unit.

Please note that access to a food room or kitchen is required for this predominantly practical Unit.



FREE LESSON Lesson 1 Origins of food

Lesson 2 Discovering flavours

Lesson 3 Kitchen management

Lesson 4 Developing a recipe

Lesson 5 Writing a recipe

Lesson 6 Creating a dish

Lesson 7 Perfecting a dish

Lesson 8+ Building a food repertoire

Edexcel GCSE 1DT0 (9-1) **Design and Technology**

The new Edexcel GCSE (9-1) series comprises five core units and six specialist units covering each of the material areas.

Unit 1: New and emerging technologies is FREE.



Get in touch to order your units

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Unit 1: New and emerging technologies - FREE

This free unit is subdivided into four topics plus an end-of-unit assessment spread across roughly five lessons. It is a theoretical unit covering the latest Edexcel Design and Technology specification 1DT0. The first lesson looks at the impact of new and emerging technology on industry and enterprise before moving on to look at the effect that industry can have on the environment. The influence that people, culture and society have on product development and vice versa are covered in the third lesson. Contemporary production techniques and scales are then covered in the final lesson before students subsequently sit an assessment test comprising questions similar to those found on the GCSE exam paper.

Lesson 1 Industry and enterprise

Lesson 2 Sustainability and the environment

Lesson 3 People, culture and society

Lesson 4 Production techniques and systems

Lesson 5 Unit assessment

This unit is free. Order today.

Unit 2: Informing design decisions

This unit covers section 1.2 of the core specification content in the new Edexcel 1DT0 specification. The first lesson looks at each of the factors that may inform design decisions. The subsequent lesson looks at contemporary and future scenarios including the areas of travel and medicine. Ethical and environmental perspectives are covered in the third lesson with specific coverage of global warming and the technologies used to reduce our impact on Earth.

Lesson 1 Critical evaluation of technologies

Lesson 2 Contemporary and future scenarios

Lesson 3 Ethical and environmental perspectives

Lesson 4 Assessment



Download a FREE topic with every unit at www.pgonline.co.uk

Many thanks for providing excellent detailed resources which will help my team endlessly!

Julia George, Head of Design and Technology, Thurston Community College

Unit 3: Energy, materials, devices and systems

This unit explores sections 1.3 - 1.7 of the new Edexcel 1DT0 Design and Technology GCSE. Energy generation from finite and non-finite sources is argued in the initial lesson before looking at energy storage in the second lesson. Developments in modern and smart materials, and their properties are covered in the following two lessons. The unit progresses to cover composite materials and technical textiles including GRP, CRP and Kevlar®. Electronic systems and mechanical devices are covered in the final lessons.

Lesson 1 Energy generation

FREE LESSON Lesson 2 Powering systems

Lesson 3 Modern and smart materials

Lesson 4 Composite materials

Lesson 5 Technical textiles

Lesson 6 Mechanical devices

Lesson 7 Electronic systems

Lesson 8 Programmable components

Unit 4: Material types, properties and structures

This unit covers the categories and properties of a complete range of core materials within each of five specialist areas. The materials are covered through practical applications and with reference to the key material category in which they belong. The specific physical and working properties that best describe each material subcategory are identified and defined with reference to use and knowledge that will underpin practical designing and making activities.

Lesson 1 Ferrous and non-ferrous metals FREE LESSON

Lesson 2 Papers and boards

Lesson 3 Polymers

Lesson 4 Textiles

Lesson 5 Natural and manufactured timbers

Lesson 6 Assessment

Unit 5: Designing principles

This unit concentrates on the main factors relating to social, economic and ecological issues. The work of past and present designers and design companies is studied before looking at design fixation and the development of design ideas.

Lesson 1 Social and economic challenge

Lesson 2 The work of others FREE LESSON

Lesson 3 Avoiding design fixation

Lesson 4 Developing design ideas

Lesson 5 Assessment



A generation ahead of anything else.

Don Jones. Assistant Principal: Achievement and Data, Ormiston Chadwick Academy.

Edexcel GCSE 1DT0 (9-1)

Specialist material categories

The 1DTO Material categories (Units 6-1 to 6-6) cover Timbers, Metals, Papers and boards, Polymers, Systems and Textiles.



Edexcel GCSE 1DT0 (9-1) Design and Technology Textbook

ISBN: 978-1-910523-13-1 £22 336pp, Ross, Arnold and Berry Available in print and digital formats

This is a complete text that provides detailed and concise coverage of all the topics and disciplines covered in the new Edexcel 1DT0 Design and Technology (9-1) specification, written and presented in a way that is accessible to teenagers and easy to teach from. It will be invaluable as a course text for students throughout their course.

It is divided into neat sections covering every element of the specification. Sections 6-1 to 6-6 of the textbook cover each of the six specialist material categories. These sections would complement practical classroom experience.

Section 1: New and emerging technologies Section 2: Informing design decisions

Section 3: Energy, materials, devices and systems

Section 4: Material types, properties and

structures

Section 5: Designing principles

Material categories:

Section 6-1: Timbers

Section 6-2: Metals

Section 6-3: Papers and boards

Section 6-4: Polymers Section 6-5: Systems

Section 6-6: Textiles

Published May 2019



Maths skills for D&T

Cross-board support at GCSE and A Level

In this series of context driven lessons, students will learn the necessary mathematical content needed to feel confident answering number- and graphically-based examination questions for any board. They will also know how to calculate the size and volume of materials as well as the tolerances and allowances needed to produce an accurate product or prototype for their NEA.

All lessons use specific Design and Technology related scenarios to deliver the content, incorporating all six specialist material areas.

The unit includes an end of unit assessment test, which includes challenging questions similar to those found in the sample assessment materials

FREE LESSON Topic 1 Decimal places and significant figures

Topic 2 Ratios and fractions

Topic 3 Percentages and standard form

Topic 4 2D and 3D shapes - area and volume

Topic 5 Working with data

Topic 6 Solving D&T problems

Topic 7 Maths for A level

Assessment







Brilliant resources. Makes teaching so much easier.

Jennifer Peirce, Head of Faculty of Engineering, SGS Berkeley Green UTC



Unit 1: New and emerging technologies - FREE

This free unit is subdivided into five topics plus an end-of-unit assessment spread across roughly six lessons. It is a theoretical unit covering the latest AQA Design and Technology specification 8552. The first lesson looks at the impact of new and emerging technology on industry and enterprise before moving on to look at the effect that industry can have on the environment. The influence that people, culture and society have on product development and vice versa are covered in the third lesson. Contemporary production techniques are then covered before a final lesson on planned obsolescence and informing design decisions. Students can then sit an assessment test comprising questions similar to those found on the GCSE exam paper

Lesson 1 Industry and enterprise

Lesson 2 Sustainability and the environment

Lesson 3 People, culture and society

Lesson 4 Production techniques and systems

Lesson 5 Informing design decisions

Lesson 6 Assessment

This unit is free. Order online.

Unit 2: Energy, materials, systems and devices

This unit explores sections 3.1.2 – 3.1.5 of the new AQA 8552 Design and Technology GCSE. Energy generation from finite and non-finite sources is argued in the initial lesson before looking at energy storage in the second lesson. Developments in modern and smart materials, and their properties are covered in the following two lessons. The unit progresses to cover composite materials and technical textiles including GRP, CRP and Kevlar®. Electronic systems and mechanical devices are covered in the final lessons.

Lesson 1 Energy generation

FREE LESSON Lesson 2 Energy storage

Lesson 3 Modern materials

Lesson 4 Smart materials

Lesson 5 Composite materials and technical textiles

Lesson 6 Systems approach to designing

Lesson 7 Electronic systems processing

Lesson 8 Mechanical devices

Lesson 9 Assessment



T 0845 840 0019



These materials are excellent for teaching the AQA course and convenient for setting homework.

Unit 3: Materials and their working properties

This unit focuses on Sections 3.1.6.1 and 3.1.6.2 of the AQA specification. It covers the categories and properties of a range of core materials within each of five specialist areas. Each lesson covers a separate specialist material area and explores the common materials used within that area related to their use when designing and making. The physical and mechanical properties of each material subcategory are also covered.

Lesson 1 Papers and boards

Lesson 2 Natural and manufactured timbers

FREE LESSON Lesson 3 Metals and alloys

Lesson 4 Polymers

Lesson 5 Textiles

Lesson 6 Assessment

Unit 4: Common specialist technical principles

This unit focuses on the specialist technical principles that are common to all material areas in Section 3.2 of the 8552 specification. The suite of lessons begins by covering the various forces and stresses on materials and objects, before looking at how to enhance them to improve their functionality. Ecological issues including product mileage and the six Rs are covered in detail across two lessons. The final lesson covers the effect of scale in production and production methods.

Lesson 1 Forces and stresses on materials and objects

Lesson 2 Improving functionality

FREE LESSON Lesson 3 Ecological and social footprint

Lesson 4 The six Rs

Lesson 5 Scales of production

Lesson 6 Assessment

Unit 5A: Papers and boards

This specialist unit covers papers and boards and is suitable for those wishing to study this area in more detail as one or more of the specialist technical option areas.

The sources, origins and properties of papers and boards are covered in the first lesson along with the processes and environmental considerations involved in converting fibres into paper. Commercial and school-based uses are covered in the second lesson with an emphasis on stock forms. Commercial production techniques such as lamination, lithography and embossing are covered in the final lesson, including specialist tools, treatments and finishes

FREE LESSON Lesson 1 Sources, origins and properties Lesson 2 Working with papers and boards Lesson 3 Commercial manufacturing, surface treatments and finishes

Lesson 4 Assessment



Unit 5B: Timber based materials

The processes involved in sourcing, converting and seasoning timber are covered in the first topic. This also covers sustainability and ethical issues, as well as the comparative advantages of manufactured boards and natural wood. The second lesson focuses on commercial stock forms, fittings and school based processing methods. Commercial processing techniques, surface treatments and finishes are covered in the final topic within the contexts of flat-packed furniture and wooden toys. Quality control techniques using go / no go gauges to check tolerances are also covered before a final assessment test using

Lesson 1 Sources, origins and properties

Lesson 2 Working with timber based materials

FREE LESSON Lesson 3 Commercial manufacturing,
surface treatments and finishes

Lesson 4 Assessment

Unit 5C: Metal based materials

examination style questions.

This specialist unit covers metal based materials and is suitable for those wishing to study this area in more detail as one or more of the specialist technical option areas. The sources, origins and properties of different metals are covered in the first lesson. Commercial and school-based uses, production techniques and modifications are covered in the subsequent two lessons, including specialist tools, treatments and finishes.

FREE LESSON Lesson 1 Sources, origins and properties

Lesson 2 Working with metal based materials and fixings

Lesson 3 Commercial manufacturing, surface treatments and finishes

Lesson 4 Assessment

Unit 5D: Polymers

In this unit, the sources, origins and properties of polymers are covered in the first lesson, along with the processes of fractional distillation and cracking. The use of plastic additives is also covered. Lesson two concentrates on working with polymers in school environments. This covers school-based processes, fixings and production techniques. Commercial cutting, forming and processing techniques in manufacture are covered in the third lesson. These include extrusion, blow moulding and injection moulding. Finishing techniques and quality control are also covered as well as reinforcing students' understanding of the properties of the different types of plastic available.

In the final lesson, students sit an assessment test comprising questions similar to those found on the GCSE exam paper.

Lesson 1 Sources, origins and properties
Lesson 2 Working with polymer based materials

FREE LESSON Lesson 3 Commercial manufacturing and quality control

Lesson 4 Assessment





The lesson plans and guides are really comprehensive and each section has an assessment.

Unit 5E: Textile based materials

This specialist unit covers textile based materials and is suitable for those wishing to study this area in more detail as one or more of the specialist technical option areas. The sources, origins and properties of different textiles are covered in the first lesson. Commercial and school-based uses, production techniques and modifications are covered in the subsequent two lessons, including specialist tools, treatments and finishes.

Lesson 1 Sources, origins and properties

FREE LESSON Lesson 2 Working with textile based materials

Lesson 3 Commercial manufacturing,

surface treatments and finishes

Lesson 4 Assessment

Unit 5F: Electronic systems

This specialist unit covers electronic and mechanical systems and is suitable for those wishing to study this area in more detail as one of the specialist technical option areas. The selection of materials and components, and their properties are covered in the first lesson. Commercial and school-based uses, production techniques and modifications are covered in the subsequent two lessons, including specialist tools, treatments and finishes.

Lesson 1 Selection of materials and components
Lesson 2 Working with electronic systems

FREE LESSON Lesson 3 Commercial manufacturing and
finishing
Lesson 4 Assessment

Unit 6: Designing principles

This unit covers the designing principles in Section 3.3.1-3.3.6 of the 8552 specification. The unit begins by looking at the various investigation techniques and the collection of data. Challenges that influence design are covered before looking at the work of other influential designers in the second lesson. Imaginative and creative design strategies are subsequently explored. The final lesson focuses on the conception and communication of ideas including prototype development.

The unit concludes with an examination style assessment test.

Lesson 1 Investigation, primary and secondary data

FREE LESSON Lesson 2A The work of other designers
Lesson 2B The work of other design companies
Lesson 3 Design strategies
Lesson 4 Communication of design ideas and prototype development
Lesson 5 Assessment

"

The resources save time and cover all of the new content of the GCSE, an area very daunting to teachers due to the spec change. It gives you a boost of confidence that you are moving in the right direction for the students.

Unit 7: Making principles

The final unit in the series explores the making principles in Section 3.3.7-3.3.11 of the 8552 specification. The first lessons analyse the functional need, cost and availability of materials required for prototype development, using appropriate tolerances when working. Material management skills including marking out are covered in Lesson 3 before looking at the use of specialist tools and equipment in the penultimate lesson. The final lesson covers the surface treatments and finishes that can be applied to materials to improve functionality and aesthetics.

FREE LESSON Lesson 1 Selection of material and components

Lesson 2 Tolerances and allowances

Lesson 3 Material management and marking out

Lesson 4 Specialist tools, equipment and techniques

Lesson 5 Surface treatments and finishes

Lesson 6 Assessment

GCSE AQA Sample Exam Papers (Pack of 3) Paper list

Each of the three papers in this pack are designed specifically for the AQA 8552 specification with correctly apportioned sections:

Section A - Core technical principles [20 Marks]

Section B - Specialist Technical Principles [30 Marks]

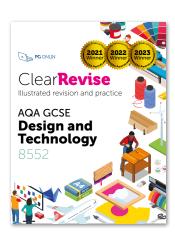
Section C - Designing and making principles [50 Marks]

The three papers have been carefully written to ensure that between them, every element of the specification is covered either directly in the questions, or in the answers students may give. Together, they will provide ample opportunity for revision purposes.

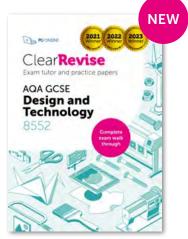
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Paper 1 plus detailed AQA style mark scheme
Paper 2 plus detailed AQA style mark scheme
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Unit 10: Modern industrial and commercial practice

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This unit covers many modern industrial and commercial practices in an engaging and inspiring way. Starting with the familiar scales of production it builds by introducing new techniques and methods seen in modern manufacturing. It moves on to look at the need for efficiency in manufacturing and how systems can implement positive change and waste reduction.

The use of computer systems in both designing and manufacturing is analysed for efficient workflow, digital design and modern manufacture.

Topic 1: Scales of production

Topic 2: Efficient use of materials and resources

Topic 3: Computer systems in manufacturing

Topic 4: Digital design and manufacture

Topic 5: Modelling, testing, marketing and scheduling

End of unit assessment

This unit is free. Order online.

Unit 1: Performance characteristics of paper and boards

After a tour through the fundamentals of paper and board production, this unit gives detailed information covering a broad range of paper and board stock. It enables students to discern between similar stock forms and make decisions about their specific properties, characteristics, uses and methods of manipulation. It culminates with a lesson on testing for specific factors and the types of finishes that can be applied to a variety of materials

Topic 1: Performance characteristics FREE LESSON

Topic 2: Applications of papers and boards

Topic 3: Recycling of papers and boards

End of unit assessment



Unit 2: Performance characteristics of polymers

The many varied and contrasting types of polymers are explained and classified in this in-depth unit. The standard range of commonly used plastics are included along with the lesser known elastomers and biodegradable polymers that are more frequently being used, both in schools and in industry. A plethora of stock forms, characteristics and properties are discussed in a format that makes it easy for students to both recall and apply the performance of polymers in use.

Topic 1: Characteristics of polymers and additives FREE LESSON

Topic 2: Applications of polymers

Topic 3: Stock forms and types of polymer

Topic 4: Elastomers

Topic 5: Biodegradable polymers

End of unit assessment

Unit 3: Performance characteristics of woods

This unit delivers informative and clear information on a wide range of natural and manufactured woods. It will enable students to differentiate between available stock forms and learn why different woods are chosen for different tasks. Also covered are the common characteristics and faults found in a broad selection of woods, as well as ways to protect them against common issues and how to enhance the natural benefits woods have to offer.

Topic 1: Stock forms and types of woods

Topic 2: Performance characteristics

Topic 3: Testing and finishing of woods FREE LESSON

End of unit assessment

Unit 4: Performance characteristics of metals

Containing specific information about a broad selection of ferrous, non-ferrous and alloyed metals, this unit explains their performance characteristics as well as the stock forms in which they are likely to be available. The enhancement of metals through heat treatment is explained as well as how the testing of different metal properties is conducted.

Topic 1: Stock forms and types of metals FREE LESSON

Topic 2: Performance characteristics of metals

Topic 3: Testing and treatments of metals

End of unit assessment



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Unit 5: Composite, smart and modern materials

A fascinating unit explaining a broad selection of composite materials and the applications they are specifically designed for. The unit moves on to discover the interesting world of smart and modern materials, incorporating all material areas. The chance for practical engagement and experimentation is encouraged throughout the unit.

Topic 1: Performance characteristics of composites

Topic 2: Performance characteristics of smart materials FREE LESSON

Topic 3: Performance characteristics of modern materials

End of unit assessment

Unit 6: Processing and working with papers and boards

Brought together in a short series of topics are the main ways to manipulate paper and board to produce the types of products produced in industry. The processes covered include many hand, machine and digital techniques. The use of industry standard printing and finishing methods is specifically highlighted in addition to common forming and bonding techniques, of which many can be modelled in school.

Topic 1: Forming processes

Topic 2: Bonding, jigs and fixtures FREE LESSON

Topic 3: Finishing papers and boards

End of unit assessment

Unit 7: Processing and working with polymers

The second of the polymers units investigates the processes involved in manipulating a multitude of different plastics in a variety of stock forms. Both school workshop- and industry-based processing is clearly explained using simple diagrams, bringing to life the incredibly versatile range of polymers.

Topic 1: Working with polymers FREE LESSON

Topic 2: Forming polymers
Topic 3: Finishing polymers
End of unit assessment



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Unit 8: Processing and working with woods

Throughout this unit, students learn how to use additive and subtractive forming techniques using a wide range of tools and equipment, in both the school workshop and modern industrial environments. The unit includes both basic and advanced joining methods and how CNC machines are used specifically for wood-based products. Additionally, the use of bought-in components and a range of finishing techniques are covered in depth.

Topic 1: Working with woods FREE LESSON

Topic 2: Forming woods Topic 3: Finishing woods End of unit assessment

Unit 9: Processing and working with metals

This very comprehensive unit covers a multitude of forging and forming techniques, explaining which metals are best used for each. The lessons cover many temporary, semipermanent and permanent methods of bonding, including welding techniques. Wasting processes are also explained as are a number of external finishes including different plating methods and less permanent applications.

Topic 1: Forming metals FREE LESSON

Topic 2: Joining metals

Topic 3: Wasting metals Topic 4: Finishing metals End of unit assessment

Unit 11: Product design considerations

In this unit, students will critically analyse and evaluate products, draw up design and manufacturing specifications, and create two- and three-dimensional prototypes in a variety of materials. Considerations for end users is highlighted, including a wide range of adaptations for the very young, the elderly and less abled users. A deep understanding of health and safety issues is delivered in addition to conducting risk assessments. The unit also ensures students show an awareness of protecting intellectual property, understand the 6Rs of sustainability and know how manufacturers create responsible products that are fit for purpose.

Topic 1: Product development and improvement FREE LESSON

Topic 2: Inclusive design

Topic 3: Safe working practices

Topic 4: Protecting designs and intellectual property

Topic 5: Manufacture, repair, maintenance and disposal

Topic 6: Efficient manufacturing techniques

Topic 7: Designed for disassembly

End of unit assessment



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Fantastic resources -The powerpoints for each unit/topic are a wonderful resource.

Unit 12: Product design and development

The journey that an idea for a product takes can vary dramatically depending on the research and testing methods used. This four-topic unit covers different enterprise opportunities as well as the post product realisation processes of branding and marketing in the modern digital age. Students will learn how to conduct a feasibility study to gauge a product's potential and why it is vital in a product's success. The unit culminates by looking at the many forms of design communication and suggest which may be better for any given task.

Topic 1: Feasibility studies FREE LESSON

Topic 2: Enterprise and marketing

Topic 3: Communicating data

Topic 4: Design communication

End of unit assessment

Unit 13: Design methods

The use of alternative design strategies and the understanding of how to gather and use research data begins this informative and inspirational unit. Design history and theory is delivered through case study investigation of design movements, influential design houses and world class designers. The unit leads students to draw conclusions about how design has shaped our modern world and how designers need to work responsibly to reduce negative global impact. The methodology for tackling this reduction concludes the lessons by unpicking a product's lifecycle and the choices that this analysis presents a designer.

Topic 1: Design methods and processes FREE LESSON

Topic 2: Design influences styles and movements

Topic 3: Designers and their work
Topic 4: Socio-economic influences

Topic 5: Developments in technology

Topic 6: Social, moral and ethical considerations

Topic 7: Product life cycle End of unit assessment

Unit 14: Design processes

This unit takes a very thorough guided tour through the design process and the many varied routes that can be taken. From idea generation, through to planning and prototyping, critical evaluation, testing and modification, lessons look at how to get the best from an NEA project brief. The unit also considers the selection of tools and equipment and the strategies employed to achieve accuracy in manufacturing.

Topic 1: The use of a design process

Topic 2: Prototype development

Topic 3: Industrial and commercial contexts

Topic 4: Critical analysis, testing and evaluation FREE LESSON

Topic 5: Third party testing and evaluation Topic 6: Tools, equipment and processes

Topic 7: Accuracy in design and manufacture

End of unit assessment



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Really useful resources to help build our new schemes of learning throughout D&T curriculum. The Maths for D&T unit has been particularly helpful.

Unit 15: Responsible design

Building on the previously covered environmental responsibilities that designers need to consider, this unit challenges wasteful attitudes and presents a modern methodology for responsible designing. Industry standard quality control implementation is investigated including an array of testing methods. The unit culminates in a lesson on national and international standards, government and EU directives and the role NGOs play in the protection and monitoring of the welfare of people and places.

Topic 1: Environmental issues

Topic 2: Circular economy FREE LESSON

Topic 3: Conservation of energy

Topic 4: Planning for accuracy

Topic 5: Quality assurance and quality control Topic 6: National and international standards

End of unit assessment

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Paper 1 - Technical principles

Paper 2 - Designing and making principles

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