OXFORD AQA
INTERNATIONAL QUALIFICATIONS

International GCSE

Design and Technology:
Product Design

(9252) Specification

For teaching from September 2023 onwards

For exams May/June 2025 onwards

For teaching and examination outside the United Kingdom

Contents

Are you using the latest version of this specification?

- You will always find the most up-to-date version of this specification on our website at **oxfordaqa.com/9252**
- We will write to you if there are significant changes to the specification.

Subject Content

Subject Level Guidance

1 Introduction

1.1 Why choose OxfordAQA International GCSEs?

Our international qualifications enable schools that follow a British curriculum to benefit from the best education expertise in the United Kingdom (UK).

Our International GCSEs offer the same rigour and high quality as GCSEs in the UK and are relevant and appealing to students worldwide. They reflect a deep understanding of the needs of teachers and schools around the globe and are brought to you by Oxford University Press and AQA, the UK's leading awarding body.

Providing valid and reliable assessments, these qualifications are based on over 100 years of experience, academic research and international best practice. They reflect the latest changes to the British system, enabling students to progress to higher education with up-to-date qualifications.

You can find out about OxfordAQA at **oxfordaqa.com**

1.2 Why choose our International GCSE Design and Technology: Product Design?

We have worked closely with teachers to develop a relevant, engaging and up-to-date design and technology specification to inspire, motivate and challenge all students regardless of their academic ability.

Particular care has been taken to make the language used in question papers as accessible as possible and suitable for those students for whom English is not their first language. UK English spellings will be used in examination papers. British idiosyncratic terms however, will be avoided to aid students' understanding.

GCSE Design and Technology: Product Design will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise.

Our GCSE allows students to study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment. They will also have the opportunity to study specialist technical principles in greater depth.

Our specification offers students a firm foundation of the knowledge and skills required for further study and future employment.

You can find out about all our International GCSE Design and Technology qualifications at **oxfordaqa.com/9252**

1.3 Recognition

OxfordAQA meet the needs of international students. Please refer to the published timetables on the exams administration page of our website (**oxfordaqa.com/exams-admin**) for up to date exam timetabling information. They are an international alternative and comparable in standard to the Ofqual regulated qualifications offered in the UK.

To see the latest list of universities who have stated they accept these international qualifications, visit **oxfordaqa.com/recognition**

1.4 Support and resources to help you teach

We know that support and resources are vital for your teaching and that you have limited time to find or develop good quality materials. That's why we've worked with experienced teachers to provide resources that will help you confidently plan, teach and prepare for exams.

Teaching resources

You will have access to:

- sample schemes of work to help you plan your course with confidence
- training and support to help you deliver our qualifications
- student textbooks that have been checked and approved by us
- command words with exemplars
- design and technology vocabulary with definitions.

Preparing for exams

You will have access to the support you need to prepare for our exams, including:

- specimen papers and mark schemes
- exemplar student answers with examiner commentaries.

Analyse your students' results with Enhanced Results Analysis (ERA)

After the first examination series, you can use this tool to see which questions were the most challenging, how the results compare to previous years and where your students need to improve. ERA, our free online results analysis tool, will help you see where to focus your teaching.

Information about results, including maintaining standards over time, grade boundaries and our post-results services, will be available on our website in preparation for the first examination series.

Help and support

Visit our website for information, guidance, support and resources at **oxfordaqa.com/9252**

You can contact the subject team directly at info@oxfordaqa.com or call us on +44 (0)161 696 5995 (option 1 and then 1 again).

Please note: We aim to respond to all email enquiries within two working days.

Our UK office hours are Monday to Friday, 8am – 5pm.

2 Specification at a glance

The title of the qualification is:

- OxfordAQA International GCSE Design and Technology: Product Design.

This qualification is linear. Linear means that students will sit all their exams at the end of the course.

The guided learning hours (GLH) for this qualification are 120–140. This figure is for guidance only and may vary according to local practice and the learner's prior experience of the subject.

2.1 Subject content

Compulsory content:

1. Core technical principles (Page 10)
2. Specialist technical principles (Page 20)
3. Designing and making principles (Page 28)
4. Design and make task (Non-Examination Assessment) (Page 36)

Specialist technical principles (section B) can be taught through one or more of the following material categories:

1. Papers and boards
2. Timber based materials
3. Polymers
4. Metal based materials

2.2 Assessments

Paper 1 : Technical, designing and making principles

What's assessed

Core technical principles

Specialist technical principles

Designing and making principles

How it's assessed

Written exam: 2 hours

100 marks

50% of GCSE

Questions

Section A – 20 marks. Core technical principles.

A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.

Section B – 30 marks. Specialist technical principles

Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.

Section C – 50 marks. Designing and making principles

A mixture of short answer and extended response questions with both written and drawn responses.

+

Non-exam assessment: Design and make task

What's assessed

Practical application of:

Core technical principles

Specialist technical principles

Designing and making principles

How it's assessed

Non-exam assessment (NEA): 30–35 hours approximately

100 marks

50% of GCSE

Task(s)

Substantial design and make task

Assessment criteria:

- Identifying and investigating design possibilities
- Producing a design brief and specification
- Generating design ideas
- Developing design ideas
- Realising design ideas
- Analysing & evaluating

In the spirit of the iterative design process, the above should be awarded holistically where they take place and not in a linear manner

Contextual challenges to be released by OxfordAQA on 1 June (May/June series) and 15 November (November series) in the year prior to the submission of the NEA

Students will produce a prototype and a portfolio of evidence

Work will be marked by teachers and moderated by OxfordAQA

3 Subject content

Our GCSE Design and Technology: Product Design specification sets out the knowledge, understanding and skills required to undertake the iterative design process of exploring, creating and evaluating. The majority of the specification should be delivered through the practical application of this knowledge and understanding.

Topics and themes have been grouped to help you teach the specification, but these are not intended as a route through the specification, you can teach the content in any order. The subject content has been split into three sections as follows:

- Core technical principles
- Specialist technical principles
- Designing and making principles

Core technical principles (page 10) covers core technical principles, and all content must be taught. Specialist technical principles (page 20) covers specialist technical principles where students will go into greater depth. Each principle should be taught through a single main material category or system, supplemented by others to obtain full content coverage.

Designing and making principles (page 28) covers design and making principles and all content in this section must be taught.

The specification content is presented in a two-column format. The left-hand column contains the specification content all students must cover, and forms the basis for the assessments. This column sets out what students must know and understand to ensure they study the topic in appropriate depth and gives teachers the depth in which the subject content will be assessed.

Students must also demonstrate some mathematical and scientific knowledge and understanding, in relation to design and technology. The right-hand column throughout this section illustrates where the maths and science skills and knowledge can be applied to the wider design and technology content. These are examples of where these skills can be applied and are not intended to be exhaustive.

3.1 Core Technical principles

In order to make effective design choices students will need a breadth of core technical knowledge and understanding that consists of:

- new and emerging technologies
- energy generation and storage
- developments in new materials
- systems approach to designing
- mechanical devices
- materials and their working properties.

All of this section must be taught, and will be assessed.

3.1.1 New and Emerging Technologies

Students must know and understand the impact of new and emerging technologies on contemporary and potential future situations in relation to the following areas:

Industry

Content	Potential links to maths and science
The impact of new and emerging technologies on: • the design and organisation of the workplace including automation and the use of robotics • buildings and the place of work • tools and equipment.	Calculating improved efficiency

Enterprise

Content	Potential links to maths and science
Enterprise based on the development of an effective business innovation: • fund raising • virtual marketing and retail • co-operative working • fair trade principles.	Presenting data in graphical form

Sustainability

Content	Potential links to maths and science
The impact of resource consumption on the planet: • finite • non–finite • disposal of waste.	

People

Content	Potential links to maths and science
How technology push/market pull can affect consumer choice. Changing job roles due to the emergence of new ways of working driven by technological change.	

Culture and Society

Content	Potential links to maths and science
Trends in relation to new and emergent technologies. Respecting the views of different faiths and beliefs. How products are designed and made to avoid having a negative impact on others: • design for disabled • elderly people.	

Environment

Content	Potential links to maths and science
Positive and negative impacts new products could have on the environment: • more efficient working • pollution • global warming.	Calculating improved efficiency

Production techniques and systems

Content	Potential links to maths and science
The current and possible future use of: • automated processes • computer aided design (CAD) • computer aided manufacture (CAM) • flexible manufacturing systems (FMS) • just in time (JIT) • lean manufacturing.	

How the critical evaluation of new and emerging technologies informs design decision making

Content	Potential links to maths and science
The importance of considering different perspectives in relationship to: • planned obsolescence • design for maintenance • ethics • environmental impact.	

3.1.2 Energy generation and storage

Students should understand how energy is generated and stored, and how this is used as a basis in the selection of power systems and sources.

Fossil fuels

Content	Potential links to maths and science
How power is generated from: • coal • gas • oil. Arguments for and against the selection of fossil fuels.	How to choose appropriate energy sources.

Nuclear power

Content	Potential links to maths and science
How nuclear power is generated. Arguments for and against the selection of nuclear power.	How to choose appropriate energy sources.

Renewable energy

Content	Potential links to maths and science
How power is generated from: • wind • solar • tidal • hydro-electrical • biomass. Arguments for and against the selection of renewable energy.	How to choose appropriate energy sources.

Energy storage systems including batteries

Content	Potential links to maths and science
Kinetic and pumped storage systems. Alkaline and re-chargeable batteries.	How to choose appropriate energy sources. Calculation of voltage in series and parallel.

3.1.3 Developments in new materials

Students should be aware of developments in new materials.

Modern materials

Content	Potential links to maths and science
Developments made through the invention of new or improved processes. e.g. Graphene, Metal foams and Titanium. Alterations to perform a particular function e.g. Coated metals, Liquid Crystal Displays (LCDs) and Nanomaterials	Classification of the types of properties of a range of materials. Selecting appropriate materials. Extracting information from technical specifications.

Smart materials

Content	Potential links to maths and science
That materials can have one or more properties that can be significantly changed in a controlled fashion by external stimuli, such as stress, temperature, moisture, or PH e.g. shape memory alloys, thermochromic pigments and photochromic pigments.	Classification of the types of properties of a range of materials. Selecting appropriate materials. Extracting information from technical specifications.

Composite materials

Content	Potential links to maths and science
That composite materials are produced by combining two or more different materials to create an enhanced material. e.g. reinforced plastics, glass reinforcement (GRP) and carbon fibre reinforcement (CRP) manufactured timber boards. Plywood, MDF, OSB	Classification of the types of properties of a range of materials. Selecting appropriate materials. Extracting information from technical specifications.

3.1.4 Systems approach to designing

Students should consider electronic systems including programmable components to provide functionality to products, and to enhance their operation.

Inputs

Content	Potential links to maths and science
The use of light sensors, temperature sensors, pressure sensors and switches.	Extracting information from technical specifications. Component names, interfacing and operation.

Processes

Content	Potential links to maths and science
The use of programmable devices, (microcontrollers) as counters, timers and for decision making to provide functionality to products.	Extracting information from technical specifications. Component names, interfacing, and operation Calculation of current flow using Ohms law

Outputs

Content	Potential links to maths and science
The use of buzzers, speakers and lamps to provide functionality to products and processes.	Extracting information from technical specifications. Component names, interfacing and operation.

3.1.5 Mechanical devices

Different types of movement

Content	Potential links to maths and science
The functions of mechanical devices to produce linear, rotary, reciprocating and oscillating movements.	Visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/ mechanical movement.

Changing magnitude and direction of force

Content	Potential links to maths and science
Levers: • levers, first, second and third classes. Linkages: • bell cranks • push/pull. Rotary systems: • cams and followers • simple gear trains • pulleys and belts.	The action of forces and how levers and gears transmit and transform the effects of forces. Arithmetic and numerical computation, e.g. use ratios. Use angular measures in degrees. Visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/ mechanical movement. Knowledge of the function of mechanical devices to produce different sorts of movement. Changing the magnitude and direction of forces. Calculation of velocity ratio

3.1.6 Materials and their working properties

Students should know and understand the types and properties of the following materials.

3.1.6.1 Material categories

Papers and boards

Content	Potential links to maths and science
Students should have an overview of the main categories and types of papers and boards: papers including: • bleed proof • cartridge paper • grid and layout paper • tracing paper boards including: • corrugated card • duplex board • foil lined board • foam core board • ink jet card • solid white board.	Classification of the types and properties of a range of materials. Physical properties of materials related to use and knowledge applied when designing and making.

Natural and manufactured timbers

Content	Potential links to maths and science
Students should have an overview of the main categories and types of natural and manufactured timbers: hardwoods including: • ash • beech • mahogany • oak • balsa softwoods including: • larch • pine • spruce manufactured boards including: • medium density fibreboard (MDF) • plywood • chipboard.	Classification of the types and properties of a range of materials. Physical properties of materials related to use and knowledge applied when designing and making.

Metal and alloys

Content	Potential links to maths and science
Students should have an overview of the main categories and types of metals and alloys: ferrous metals including: • low carbon steel • cast Iron • high carbon/tool steel • stainless steel non-ferrous metals and alloys including: • aluminium • copper • tin • zinc • brass	Classification of the types and properties of a range of materials. Physical properties of materials related to use and knowledge applied when designing and making.

Polymers

Content	Potential links to maths and science
Students should have an overview of the main categories and types of polymers: thermoplastic including: • acrylic (PMMA) • high impact polystyrene (HIPS) • high density polythene (HDPE) • polypropylene (PP) • polyvinyl chloride (PVC) • polyethylene terephthalate (PET) thermosetting including: • epoxy resin (ER) • melamine-formaldehyde (MF) • phenol formaldehyde (PF) • polyester resin (PR) • urea–formaldehyde (UF).	Classification of the types and properties of a range of materials. Physical properties of materials related to use and knowledge applied when designing and making.

3.1.6.2 Material properties

Students should understand the working and physical properties of the materials listed in Material categories (page 16).

Content	Potential links to maths and science
In relation to the main categories outlined above (not the specific materials identified), students should know and understand physical properties such as: • absorbency (resistance to moisture) • density • fusibility • electrical and thermal conductivity. In relation to the main categories outlined above (not the specific materials identified), students should know and understand working properties such as: • strength • hardness • toughness • malleability • ductility • elasticity.	Scientific vocabulary e.g., metals/non-metals and physical and chemical differences between them e.g., types and properties across a range of materials. Using materials e.g., composition of some important alloys e.g., selection of an alloy for low density in a particular design situation.

3.2 Specialist technical principles

In addition to the core technical principles, all students should develop an in-depth knowledge and understanding of the following specialist technical principles:

- selection of materials or components
- forces and stresses
- ecological and social footprint
- sources and origins
- using and working with materials
- stock forms, types, and sizes
- scales of production
- specialist techniques and processes
- surface treatments and finishes.

Each specialist technical principle should be delivered through **at least one** main material category or system. However, not all principles outlined above relate to every material category or system, but all must be taught, supplemented by other material categories to obtain full content coverage.

The categories through which the principles can be delivered are:

- papers and boards
- timber based materials
- metal based materials
- polymers.

3.2.1 Selection of materials or components

In relation to **at least one** material category or system, students should be able to select materials and components considering the factors listed below.

Content	Potential links to maths and science
Functionality: application of use, ease of working. Aesthetics: surface finish, texture and colour. Environmental factors: recyclable or reused materials. Availability: ease of sourcing and purchase. Cost: advantages of bulk buying. Social factors: having social responsibility. Cultural factors: sensitive to cultural influences. Ethical factors: obtained from ethical sources.	Calculation of material costs. Selection and use of materials considering their end of life disposal.

3.2.2 Forces and stresses

In relation to **at least one** material category or system, students should know and understand the impact of forces and stresses and the ways in which materials and products can be constructed, reinforced or stiffened to withstand such forces.

Content	Potential links to maths and science
Tension, compression, bending, torsion and shear. Stress and strain How materials can be reinforced, stiffened or made more flexible: eg lamination, bending, folding.	Understanding the magnitude and direction of forces. Calculation of stress using stress=force/cross sectional area Calculation of strain using Strain= change in length/ original length

3.2.3 Ecological and social footprint

In relation to **at least one** material category or system, students should have a knowledge and understanding of the ecological and social footprint left by designers.

Ecological issues in the design and manufacture of products

Content	Potential links to maths and science
Deforestation, mining minerals, drilling for oil and gas. The mileage of product from raw material source, manufacture, distribution, user location and final disposal. That carbon is produced during the manufacture of products.	Selecting appropriate materials. Understanding how to choose appropriate energy sources. Considering waste disposal procedures.

Sustainability

Content	Potential links to maths and science
Using the approach of the six Rs: Reduce, refuse, re-use, repair, recycle and rethink.	Understanding issues related to recycling.

Social issues in the design and manufacture of products

Content	Potential links to maths and science
Designing safe products. Providing safe working conditions. Reducing oceanic/ atmospheric pollution and minimising the detrimental (negative) impact on others.	Ethical factors and the social footprint of materials used in products.

3.2.4 Sources and origins

In relation to **at least one** material category, students should know and understand the sources and origins of materials.

Content	Potential links to maths and science
Primary sources of materials and the main processes involved in converting into workable forms for at least one material area. • Paper and board (how cellulose fibres are obtained from wood and grasses and converted into paper). • Timber based materials (Seasoning, conversion and how manufactured timbers are produced). • Metal based materials (extraction and reduction). • Polymers (refining crude oil, fractional distillation, and cracking).	Life cycle and recycling. The basic principles in carrying out a life cycle assessment of a material.

3.2.5 How materials are used in products

In relation to **at least one** material category or system, students should know and understand the factors listed below in addition to material properties (page 19).

Properties of materials

Content	Potential links to maths and science
Students must know and understand how different properties of materials and components are used in commercial products. How properties influence use and affect performance. Students must know and understand the physical and mechanical properties relevant to commercial products in their chosen area as follows: • Papers and boards (flyers/leaflets and card-based food packaging). • Timber based materials (traditional timber children's toys and flat pack furniture). • Metal based materials (cooking utensils and hand tools). • Polymers (polymer seating and electrical fittings).	

The modification of properties for specific purposes

Content	Potential links to maths and science
• Additives to prevent moisture transfer (paper and boards). • Seasoning to reduce moisture content of timbers (timber based materials). • Annealing to soften material to improve malleability (metal based materials). • Stabilisers to resist UV degradation (polymers).	Practical testing of materials.

How to shape and form using cutting, abrasion and addition

Content	Potential links to maths and science
• Papers and boards (how to cut, crease, score, fold and perforate card). • Timber based materials (how to cut, drill, chisel, sand and plane). • Metal based materials (how to cut, drill, turn, mill, cast, braze and weld). • Polymers (how to cut, drill, cast, deform, print and weld).	Measuring length, controlling temperature, heat, speed.

3.2.6 Stock forms, types and sizes

In relation to **at least one** material category or system, students should know and understand the different stock forms, types and sizes in order to calculate and determine the quantity of materials or components required.

Content	Potential links to maths and science
Commercially available types and sizes of materials and components. Papers and boards: • sheet, roll and ply • sold by size e.g. A3, thickness, weight and colour • standard components e.g., fasteners, seals and bindings • cartridge paper and corrugated card. Timber based materials: • planks, boards and standard mouldings • sold by length, width, thickness and diameter • standard components e.g., woodscrews, hinges, Knock-Down (KD) fittings. Metal based materials: • sheet, rod, bar and tube • sold by length, width, thickness, and diameter • standard components e.g., rivets, machine screws, nuts, and bolts. Polymers: • sheet, rod, powder, granules, foams, and films • sold by length, width, gauge and diameter • standard components e.g., screws, nuts and bolts, hinges.	Calculation of material quantities and sizes. Calculate surface area and volume eg material requirements for a specific use. Efficient material use, pattern spacing, nesting and minimising waste. Measurement of length, thickness, or volume.

3.2.7 Scales of production

In relation to **at least one** material category or system, students should be able to select materials and components considering scales of production and referencing the processes listed in Specialist techniques and processes (page 25).

Content	Potential links to maths and science
How products are produced in different volumes. The reasons why different manufacturing methods are used for different production volumes: • prototype • batch • mass • continuous Fixed and variable cost.	Calculating costs and break-even points in different types of production.

3.2.8 Specialist techniques and processes

In relation to **at least one** material category or system, students should know and understand the factors listed below.

The use of production aids

Content	Potential links to maths and science
How to use measurement/reference points, templates, jigs, and patterns where suitable	Scaling of drawings. Working to datums. Calculating material quantities required.

Tools, equipment and processes

Content	Potential links to maths and science
A range of tools, equipment and processes that can be used to shape, fabricate, construct, and assemble high quality prototypes, as appropriate for the materials being used including: wastage, such as: • die cutting • perforation • turning • sawing • milling and routing • drilling • cutting and shearing addition, such as: • brazing • welding • lamination • soldering • 3D printing • printing shaping such as: • vacuum forming • creasing • pressing • drape forming • bending • folding • blow moulding • casting • injection moulding • extrusion.	

How products are made to a tolerance

Content	Potential links to maths and science
Manufacturing to minimum and maximum measurements.	Extracting information on tolerances and using that to control quality when making a prototype.

The application and use of quality control

Content	Potential links to maths and science
• Papers and boards (registration marks). • Timber based materials (dimensional accuracy using go/no go fixture). • Metal based materials (dimensional accuracy using measuring equipment). • Polymers (dimensional accuracy by selecting correct laser cutting settings).	Use of datums, percentages and simple statistics.

Commercial processes

Content	Potential links to maths and science
• Papers and boards (offset lithography and die cutting). • Timber based materials (routing and turning). • Metal based materials (milling and casting). • Polymers (injection moulding and extrusion).	

3.2.9 Surface treatments and finishes

In relation to **at least one** material category or system, students should have knowledge and understanding of surface treatments and finishes.

Content	Potential links to maths and science
The preparation and application of treatments and finishes to enhance functional and aesthetic properties. • Papers and boards (printing, embossing and UV varnishing). • Timber based materials (painting, varnishing and preserving). • Metal based materials (dip coating, powder coating and galvanizing). • Polymers (polishing, printing and vinyl decals).	

3.3 Designing and making principles

Students should know and understand that all design and technology activities take place within a wide range of contexts.

They should also understand how the prototypes they develop must satisfy wants or needs and be fit for their intended use. For example, the home, school, work or leisure.

They will need to demonstrate and apply knowledge and understanding of designing and making principles in relation to the following areas:

- investigation, primary and secondary data
- environmental, social and economic challenge
- design strategies
- communication of design ideas
- prototype development
- selection of materials and components
- tolerances
- material management
- specialist tools and equipment
- specialist techniques and processes.

3.3.1 Investigation, primary and secondary data

Use primary and secondary data to understand client and/or user needs

Content	Potential links to maths and science
How the following techniques are used and applied: • market research, interviews and human factors including ergonomics • focus groups and product analysis and evaluation • the use of anthropometric data and percentiles.	Analysing responses to user questionnaires. Frequency tables and information on design decisions. Presentation of client survey responses. Percentiles ranges used in anthropometrics and/or ergonomics.

Carry out investigations in order to identify problems and needs

Content	Potential links to maths and science
Why a designer considers alterations to a brief and modifying the brief as required.	Comparative chart of performance criteria as for existing products to help evaluate them.

Writing a design brief and producing design and manufacturing specifications

Content	Potential links to maths and science
Students should consider their own needs, wants and interests and those of others. Developing a quantifiable and testable design specification. Producing a clear manufacturing specification.	Selection of materials based on ethical factors and social and environmental footprints. Comparisons of performance. Estimates of quantities of materials needed.

3.3.2 Environmental, social and economic challenge

Content	Potential links to maths and science
The environment, social and economic challenges that influence design and making. How the following might present opportunities and constraints that influence the processes of designing and making: • deforestation • resource depletion e.g., water, minerals • possible increase in carbon dioxide levels leading to potential global warming.	Selection of materials based on ethical factors and social and environmental footprints.

3.3.3 Design strategies

Generate imaginative and creative design ideas using a range of different design strategies

Content	Potential links to maths and science
How different strategies can be applied, including: • collaboration • user centred design • a systems approach • iterative design • avoiding design fixation.	

Explore and develop their own ideas

Content	Potential links to maths and science
How this can be done using an iterative process including: • sketching • modelling • testing • evaluation of their work to improve outcomes.	Measurement and marking out of component parts for models.

3.3.4 Communication of design ideas

Content	Potential links to maths and science
Develop, communicate, record and justify design ideas using a range of appropriate techniques such as: • freehand sketching, isometric and perspective • 2D and 3D drawings • system and schematic diagrams • annotated drawings that explain detailed development or the conceptual stages of designing • exploded diagrams to show constructional detail or assembly • working drawings: 3rd angle orthographic, using conventions, dimensions and drawn to scale • audio and visual recordings in support of aspects of designing: e.g., interviews with client or users • mathematical modelling • computer-based tools • modelling: working directly with materials and components, e.g., card modelling, producing a scale model, constructing a circuit using breadboard.	Using angular measurement in degrees Visualising 2D and 3D forms Representing 3D forms in 2D representations Drawing to scale

3.3.5 Prototype development

Content	Potential links to maths and science
Design and develop prototypes in response to client wants and needs. Note: the term prototype can be used to describe either a product or system. How the development of prototypes: • satisfy the requirements of the brief • respond to the client's wants and needs • demonstrate innovation • are functional • consider aesthetics • are potentially marketable. Students should know and understand how to evaluate prototypes and be able to: • reflect critically, responding to feedback when evaluating their own prototypes • assess if prototypes are fit for purpose • suggest modifications to improve them through inception and manufacture	A presentation of data; tabulate responses and findings.

In relation to **at least one** of the following material categories students must develop and apply an in-depth knowledge and understanding of sections Selection of materials and components (page 32) to Specialist techniques and processes (page 33)

- papers and boards
- timber based materials
- metal based materials
- polymers

3.3.6 Selection of materials and components

Content	Potential links to maths and science
Appropriate materials and components to make a prototype. How to select and use materials and components appropriate to the task considering: • functional need • cost • availability.	SI units; identify appropriate commercially available stock forms and select appropriately. Characteristics of commercially available timbers Composition of some important alloys; selecting appropriate metal alloys as required. Characteristics of commonly available polymers.

3.3.7 Tolerances

Content	Potential links to maths and science
Work accurately using tolerances. How a range of materials are cut, shaped and formed to designated tolerances. Why tolerances are applied during making activities.	Percentage tolerances. Use of datums.

3.3.8 Material management

Cut materials efficiently and minimise waste

Content	Potential links to maths and science
The importance of planning the cutting and shaping of material to minimise waste e.g. nesting of shapes and parts to be cut from material stock forms. How additional material may be removed by a cutting method or joint overlap etc.	Use angular measures e.g., tessellation of component parts. Calculating material area e.g., working out the quantity of materials required. SI units e.g., accurate use of appropriate units of measurement to calculate material requirements.

Use appropriate marking out methods, data points and coordinates

Content	Potential links to maths and science
The value of using measurement and marking out to create an accurate and quality prototype. The use of data points and coordinates including the use of reference points, lines and surfaces, templates, jigs and/or patterns.	Use angular measures e.g., tessellation of component parts. SI units e.g., accurate use of appropriate units of measurement to calculate material requirements.

3.3.9 Specialist tools and equipment

Content	Potential links to maths and science
How to select and use specialist tools and equipment, including hand tools, machinery, digital design and manufacture, appropriate for the material and/or task to complete quality outcomes. How to use them safely to protect themselves and others from harm.	

3.3.10 Specialist techniques and processes

Content	Potential links to maths and science
How to select and use specialist techniques and processes appropriate for the material and/or task and use them to the required level of accuracy in order to complete quality outcomes. How to use them safely to shape, fabricate and construct a high quality prototype, including techniques such as wastage, addition and shaping.	

Surface treatments and finishes

Content	Potential links to maths and science
Students should know and understand that surface treatments and finishes are applied for functional and aesthetic purposes. How to prepare a material for a treatment or finish. How to apply an appropriate surface treatment or finish.	Corrosion and oxidation e.g., how corrosion and/or oxidation affects different materials, how they can be protected through different surface treatments and finishes.

4 Scheme of assessment

Find mark schemes, and specimen papers for new courses, on our website at **oxfordaqa.com/9252**

This is a linear qualification. In order to achieve the award, students must complete all assessments at the end of the course and in the same series.

Our International GCSE exams and certification for this specification are available for the first time in May/June 2025 and then every May/June and November for the life of the specification.

All materials are available in English only.

Our GCSE exams in Design and Technology: Product Design include questions that allow students to demonstrate their ability to:

- draw together their knowledge, skills and understanding from across the full course of study
- provide extended responses.

4.1 Aims and learning outcomes

Courses based on this specification should encourage students to:

- demonstrate their understanding that all design and technological activity takes place within contexts that influence the outcomes of design practice
- develop realistic design proposals as a result of the exploration of design opportunities and users' needs, wants and values
- use imagination, experimentation and combine ideas when designing
- develop the skills to critique and refine their own ideas whilst designing and making
- communicate their design ideas and decisions using different media and techniques, as appropriate for different audiences at key points in their designing
- develop decision making skills, including the planning and organisation of time and resources when managing their own project work
- develop a broad knowledge of materials, components and technologies and practical skills to develop high quality, imaginative and functional prototypes
- be ambitious and open to explore and take design risks in order to stretch the development of design proposals, avoiding clichéd or stereotypical responses
- consider the costs, commercial viability and marketing of products
- demonstrate safe working practices in design and technology
- use key design and technology terminology including those related to: designing, innovation and communication; materials and technologies; making, manufacture and production; critiquing, values and ethics.

4.2 Assessment Objectives

The exams and non-exam assessment will measure how students have achieved the following assessment objectives.

- AO1: Identify, investigate and outline design possibilities to address needs and wants.
- AO2: Design and make prototypes that are fit for purpose.
- AO3: Analyse and evaluate:
    - design decisions and outcomes, including for prototypes made by themselves and others
    - wider issues in design and technology.
- AO4: Demonstrate and apply knowledge and understanding of:
    - technical principles
    - designing and making principles.

4.2.1 Assessment Objective weightings

Assessment Objectives (AOs)	Component weightings (%)		Overall weighting of AOs (%)
	Paper 1	NEA	
AO1	0	10	10
AO2	0	30	30
AO3	10	10	20
AO4	40	0	40
Overall weighting of units (%)	50	50	100

4.3 Assessment weightings

Component	Maximum raw mark	Scaling factor	Maximum scaled mark
Paper 1	100	x1	100
NEA	100	x1	100
		Total scaled mark:	200

5 Non-exam assessment (NEA)

Non-exam assessment (NEA) refers to the coursework elements of this specification. This specification contains the following non-exam assessment:

Students will complete a working prototype and a concise portfolio of approximately 20 pages of A3 paper, equivalent A4 paper or the digital equivalent.

We are committed to working with schools to deliver non-exam assessments of the highest quality and have developed practices and procedures that support this aim. We will maintain those same high standards through their use for OxfordAQA International Qualifications. The head of the school is responsible for making sure that NEA is conducted in line with our instructions.

For more information on the administration of the non-exam assessment, please refer to the Non-exam assessment guidance section on the exams administration page of our website at **oxfordaqa.com/exams-admin**

The task

The Non-exam assessment will contribute towards 50% of the student's overall mark. The NEA project in its entirety should take between 30–35 hours to complete and consist of a working prototype and a concise portfolio of approximately 20 pages of A3 paper, equivalent A4 paper or the digital equivalent.

Students' work should consist of an investigation into one of three provided contextual challenges. Defining the needs and wants of the user and include sufficient relevant research to produce a design brief and specification.

Whenever possible the cooperation of a third party user or client will enable the student to adopt an objective viewpoint when making design decisions.

Students should generate design ideas with flair and creativity and develop these to create a final design solution (including modelling). A manufacturing specification should be produced as the result of the development of their design. Leading into the realisation of a final prototype that is fit for purpose accompanied by a final evaluation. Students should investigate, analyse and evaluate throughout the portfolio and discuss all decisions made.

Six criteria are provided for assessment and there are several points within each. Each band should be viewed holistically when marking assessments. Students who produce no evidence of work for a criterion, or work that is below a GCSE standard should be awarded zero.

The criteria should not be viewed as a linear process to be followed in a step by step manner. Rather, students should be encouraged to follow the iterative design process, and assessors are encouraged to award marks where they are deserved. You should ensure that the criteria are assessed accurately and students are not rewarded for quantity of work but the quality of work produced.

With the assessment process being viewed holistically it's vital that students clearly record their work so it is clear where the marks can be awarded. It's also essential that teachers provide clear annotation to support their assessments.

5.1 Setting the task

Students will be required to undertake a small-scale design and make task and produce a final prototype based on a design brief produced by the student.

The contextual challenges for the task will be set by us and allow students to select from a short list issued to schools via Centre Services. The contexts will change every year and will be released on 1 June (May/June series) and 15 November (November series) in the year prior to the assessment being submitted.

5.2 Evidence

Students must produce a written or digital design folder clearly evidencing how the assessment criteria have been met, together with photographic evidence of the final manufactured prototype. Students should produce a concise folder.

We recommend that this folder does not exceed 20 pages of A3 paper, equivalent A4 paper or the digital equivalent. Students who do not follow these guidelines will penalise themselves by not meeting the expectations of the assessment appropriately.

Digital portfolios should be submitted for moderation in either PDF or PowerPoint format. They should be virus checked, and not contain any links to external files or websites.

Students that exceed the recommended length will self-penalise by not being appropriately focused on the demands of the task. Students that produce work that is shorter than the recommended page count will self-penalise by not allowing appropriate coverage of the assessment objectives.

5.3 Feedback

Feedback is any helpful information or advice provided to a student about their NEA work.

Students are free to revise and redraft a piece of work before submitting the final piece for assessment. You can review draft work and provide **generic feedback** to ensure that the work is appropriately focused. In providing generic feedback you **can**:

- provide feedback in oral and/or written form
- explain syntax in general terms
- advise on resources that could be used
- remind students of the key sections that should be included in their final folder. In providing **generic feedback** you **cannot**:
    - correct a student's work
    - provide templates, model answers or writing frames
    - provide specific guidance
    - provide specific feedback to students on how to improve their projects to meet the requirements of the marking criteria
    - give examples of how to implement
    - provide feedback where a student has produced an incomplete stage, and this is sufficient to allow progression to the next stage.

A clear distinction must be drawn between providing feedback to students as part of work in progress and reviewing work once it has been submitted by the student for final assessment. Once work is submitted for final assessment it cannot be revised. It is not acceptable for you to give, either to individual students or to groups, feedback and suggestions as to how the work may be improved in order to meet the marking criteria.

In accordance with the OxfordAQA Instructions for conducting NEA, any support or feedback given to individual students which has not been provided to the whole class must be clearly recorded on the *Candidate Record Form* (CRF) and the student's mark must be appropriately adjusted to represent the level of the student's unaided achievement.

5.4 Assessment criteria

Guidance on applying the marking criteria

Level of response marking instructions are broken down into mark bands, each of which has a descriptor. The descriptor for the mark band shows the average performance for the level required. Before you apply the mark scheme to a student's project, review both the prototype and portfolio and annotate it and/or make notes on it to show the qualities that are being looked for. You can then apply the marking criteria.

Start at the lowest band of the marking criteria and use it as a ladder to see whether the work meets the descriptor for that band. The descriptor for the band indicates the different qualities that might be seen in the student's work for that level. If it meets descriptors for the lowest band then go to the next one and decide if it meets this, and so on, until you have a match between the band descriptor and the student's work.

You can compare your student's work with the standardisation examples to determine if it is the same standard, better or worse. When assigning a level, you should look at the overall quality of the work. If the project covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the work to help decide the mark within the band.

To select the most appropriate mark in the band descriptor, teachers should use the following guidance to locate the best-fit:

- where the student's work fully meets all statements, the highest mark should be awarded
- where the student's work mostly meets all statements, the most appropriate mark in the middle of the range should be awarded
- where the learner's work just meets the majority of statements, the lowest mark should be awarded.

There will be instances where a student fully meets for example 3/4 statements but only just meets the other. In this scenario a best-fit approach should be taken. If, in this scenario, the range of marks within the band was 16–20, then a mark of 18/19 would be appropriate.

The assessment criteria for the NEA are split into six sections as follows.

<table>
<tr><th></th><th>Section</th><th>Criteria</th><th>Maximum marks</th></tr>
<tr><td rowspan="2">AO1

Identify, investigate and outline design possibilities</td><td>A</td><td>Identifying & investigating design possibilities</td><td>10</td></tr>
<tr><td>B</td><td>Producing a design brief & specification</td><td>10</td></tr>
<tr><td rowspan="3">AO2

Design and make prototypes that are fit for purpose</td><td>C</td><td>Generating design ideas</td><td>10</td></tr>
<tr><td>D</td><td>Developing design ideas</td><td>20</td></tr>
<tr><td>E</td><td>Realising design ideas</td><td>30</td></tr>
<tr><td>AO3

Analyse and evaluate</td><td>F</td><td>Analysing & evaluating</td><td>20</td></tr>
<tr><td></td><td colspan="2">Total</td><td>100</td></tr>
</table>

5.4.1 Section A: Identifying and investigating design possibilities (10 marks)

By analysing the contextual challenge students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions.

Mark band	Description
Level 4: 9–10 marks	Design possibilities identified and thoroughly explored, directly linked to a contextual challenge demonstrating excellent understanding of the problems/opportunities. A user/client has been clearly identified and is entirely relevant in all aspects to the contextual challenge and student has undertaken a comprehensive investigation of their needs and wants, with a clear explanation and justification of all aspects of these. Comprehensive investigation into the work of others that clearly informs ideas. Excellent design focus and full understanding of the impact on society including; economic and social effects. Extensive evidence that investigation of design possibilities has taken place throughout the project with excellent justification and understanding of possibilities identified.
Level 3: 6–8 marks	Design possibilities identified and explored, linked to a contextual challenge demonstrating a good understanding of the problems/opportunities. A user/client has been identified that is mostly relevant to the contextual challenge and student has undertaken an investigation of their needs and wants, with a good explanation and justification of most aspects of these. Detailed investigation into the work of others that has influenced ideas. Good design focus and understanding of the impact on society including economic and social effects. Evidence of investigation of design possibilities at various stages in the project with good justification and understanding of possibilities identified.
Level 2: 3–5 marks	Design possibilities identified and explored with some link to a contextual challenge demonstrating adequate understanding of the problems/ opportunities. A user/client has been identified that is partially relevant to the contextual challenge. Student has undertaken an investigation of their needs and wants, with some explanation and justification of some aspects of these. Some investigation into the work of others that has had some influence on their ideas. Some design focus and understanding of the impact on society including economic and social effects. Investigation of design possibilities goes beyond the initial stages of the project but only some justification and understanding of possibilities identified.

Mark band	Description
Level 1: 1–2 marks	Basic design possibilities identified. Link to a contextual challenge is unclear and student demonstrates only a limited understanding of the problems/ opportunities. An attempt has been made to identify a user/client but is not be relevant to the contextual challenge. Student has undertaken a basic investigation of their needs and wants but given little explanation and justification of these. Basic investigation into the work of others but has not been used to inform their ideas. Limited design focus and understanding of the impact on society including economic and social effects. Investigation of design possibilities only takes place in the initial stages of the project and there is very little justification and understanding of possibilities identified.
0 marks	Nothing worthy of credit.

5.4.2 Section B: Producing a design brief and specification (10 marks)

Based on conclusions from their investigations students will outline design possibilities by producing a design brief and design specification. Students should review both throughout the project.

Mark band	Description
Level 4: 9–10 marks	Comprehensive design brief which clearly justifies how they have considered their user/client's needs and wants and links directly to the context selected. Comprehensive design specification with very high level of justification linking to the needs and wants of the client/user. Fully informs subsequent design stages.
Level 3: 6–8 marks	Good design brief with an attempt to justify how they have considered most of their client's needs and wants and has clear links to the context selected. Detailed design specification with good justification linking to the needs and wants of the client/user. Largely informs subsequent design stages.
Level 2: 3–5 marks	Adequate design brief with some consideration of their client's needs and wants is evident, as is the relevance to the context selected. Adequate design specification lacking some detail. Some justification linking to the needs and wants of the client/user. Informs subsequent design stages to some extent.
Level 1: 1–2 marks	Basic design brief that contains only limited consideration of their client's needs and wants and has little or no relevance to the context selected. Basic design specification has minimal detail. Limited justification linking to the needs and wants of the client/user. Very little influence on subsequent design stages.
0 marks	Nothing worthy of credit.

5.4.3 Section C: Generating design ideas (10 marks)

Students should explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate.

Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting with different ideas and possibilities that avoid design fixation.

In the highest band students are expected to show some innovation by generating ideas that are different to the work of the majority of their peers or demonstrate new ways of improving existing solutions.

Mark band	Description
Level 4: 8–10 marks	Imaginative, creative and innovative ideas have been generated, fully avoiding design fixation and with full consideration of functionality, aesthetics and innovation. Ideas have been generated, that take full account of on-going investigation that is both fully relevant and focused. Extensive experimentation and excellent communication is evident, using a wide range of techniques. Imaginative use of different design strategies for different purposes and as part of a fully integrated approach to designing.
Level 3: 5–7 marks	Imaginative and creative ideas have been generated which mainly avoid design fixation and have adequate consideration of functionality, aesthetics and innovation. Ideas have been generated, considering on-going investigation that is relevant and focused. Good experimentation and communication is evident, using a wide range of techniques. Evidence of the use of different design strategies for different purposes as an approach to designing.
Level 2: 3–4 marks	Imaginative ideas have been generated with a degree of design fixation and having some consideration of functionality, aesthetics and innovation. Ideas have been generated that take some account of investigations carried out but may lack relevance and/or focus. Communication is evident, using a limited range of techniques. Different design strategies explored but only at a superficial level with the approach being narrow.
Level 1: 1–2 marks	Basic ideas have been generated with clear design fixation and limited consideration of functionality, aesthetics and innovation. Ideas generated taking little or no account of investigations carried out. Basic experimentation and communication is evident, using a limited number of techniques. Basic use of a single design strategy.
0 marks	Nothing worthy of credit.

5.4.4 Section D: Developing design ideas (20 marks)

Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced.

Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists.

Mark band	Description
Level 4: 16–20 marks	Very detailed development work is evident, using a wide range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Excellent modelling, using a wide variety of methods to test their design ideas, fully meeting all requirements. Totally appropriate materials/components selected with extensive research into their working properties and availability. Fully detailed manufacturing specification is produced with comprehensive justification to inform manufacture.
Level 3: 11–15 marks	Good development work is evident, using a range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Good modelling which uses a variety of methods to test their design ideas, largely meeting requirements. Materials/components selected are mostly appropriate with research into their working properties and availability. Largely detailed manufacturing specification is produced with good justification to inform manufacture.
Level 2: 6–10 marks	Development work is sufficient, using some 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Modelling is sufficient, using a variety of methods to test their design ideas, meeting some requirements. Materials/components selected with some research into their working properties and availability. Some of these may not be fully appropriate for purpose. Adequate manufacturing specification contains sufficient detail with some justification to inform manufacture.

Mark band	Description
Level 1: 1–5 marks	Basic development work is evident, using a limited range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Modelling is basic, using a limited number of methods to test their design ideas meeting requirements only superficially. Materials/components selected with minimal research into their working properties or availability and may not be fully fit for purpose. Some of these may not be fully appropriate for purpose. Basic manufacturing specification that lacks detail and has minimal justification to inform manufacture.
0 marks	Nothing worthy of credit.

5.4.5 Section E: Realising design ideas (30 marks)

Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC.

The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.

Mark band	Description
Level 3: 21–30 marks	The correct tools, materials and equipment (including CAM where appropriate) have been consistently used or operated safely with an exceptionally high level of skill. A high level of quality control is evident to ensure the prototype is accurate by consistently applying very close tolerances. Prototype shows an exceptionally high level of making/finishing skills that are fully consistent and appropriate to the desired outcome. An exceptionally high quality prototype that has the potential to be commercially viable has been produced and fully meets the needs of the client/user.
Level 2: 11–20 marks	The correct tools, materials and equipment (including CAM where appropriate) have been used or operated safely with a good level, of skill. Detailed quality control is evident to ensure the prototype is mostly accurate through partial application of tolerances. Prototype shows a good level of making/finishing skills that are largely consistent and appropriate to the desired outcome. A good quality prototype that may have potential to be commercially viable has been produced which mostly meets the needs of the client/user.
Level 1: 1–10 marks	Tools, materials and equipment (including CAM where appropriate) have been used or operated safely at a basic level. Basic quality control is evident through measurement with little evidence of testing. Prototype shows a basic level of making/finishing skills which may not be appropriate for the desired outcome. A prototype of basic quality has been produced with little or no potential to be commercially viable and does not meet the needs of the client/user.
0 marks	Nothing worthy of credit.

5.4.6 Section F: Analysing and evaluating (20 marks)

Within the iterative design process, students are expected to continuously analyse and evaluate their work, using their decisions to improve outcomes. This is expected to include client/ user involvement. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s) will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype(s).

Mark band	Description
Level 4: 16–20 marks	Extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties. Comprehensive testing of all aspects of the final prototype against the design brief and specification. Fully detailed and justified reference is made to any modifications both proposed and undertaken. Excellent ongoing analysis and evaluation evident throughout the project that clearly influences the design brief and the design and manufacturing specifications.
Level 3: 11–15 marks	Good evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype, including some consideration of feedback from third parties. Good testing of most aspects of the final prototype against the design brief and specification. Detailed reference is made to any modifications either proposed or undertaken. Good analysis and evaluation at most stages of the project that influences the design brief and the design and manufacturing specifications.
Level 2: 6–10 marks	Some evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype, including basic consideration of feedback from third parties. Adequate testing of some aspects of the final prototype against the design brief and specification. Some reference is made to modifications either proposed or undertaken. Adequate analysis and evaluation are both present at some stages of the project but do not have sufficient influence on the design brief and the design and manufacturing specifications.
Level 1: 1–5 marks	Limited evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype. Basic testing of some aspects of the final prototype against the design brief and specification. Little reference is made to any modifications either proposed or undertaken. Superficial analysis and evaluation. Little influence on the design brief and the design and manufacturing specifications.
0 marks	Nothing worthy of credit.

6 General administration

We are committed to delivering assessments of the highest quality and have developed practices and procedures that support this aim. To ensure that all students have a fair experience, we have worked with other awarding bodies in England to develop best practice for maintaining the integrity of exams. This is published through the Joint Council for Qualifications (JCQ). We will maintain the same high standard through their use for OxfordAQA.

More information on all aspects of administration is available at **oxfordaqa.com/exams-admin**

For any immediate enquiries please contact **info@oxfordaqa.com**

Please note: We aim to respond to all email enquiries within two working days.

Our UK office hours are Monday to Friday, 8am – 5pm local time.

6.1 Entries and codes

You only need to make one entry for each qualification – this will cover all the question papers and certification.

Qualification title	OxfordAQA entry code
OxfordAQA International GCSE Design and Technology: Product Design	9252

Please check the current version of the Entry Codes book and the latest information about making entries on **oxfordaqa.com/exams-admin**

Exams will be available May/June and in November.

6.2 Overlaps with other qualifications

This specification overlaps with the AQA UK GCSE in Design and Technology (8552).

6.3 Awarding grades and reporting results

In line with UK GCSEs, this qualification will be graded on a nine-point scale: 1 to 9 – where 9 is the best grade. Students who fail to reach the minimum standard for grade 1 will be recorded as U (unclassified) and will not receive a qualification certificate.

To find out more about the new grading system, visit our website at **oxfordaqa.com**

6.4 Resits

Students may resit this qualification any number of times within the life of the specification. NEA results can be carried forward for any students re-sitting the qualification.

6.5 Previous learning and prerequisites

There are no previous learning requirements. Any requirements for entry to a course based on this specification are at the discretion of schools.

6.6 Access to assessment: equality and inclusion

Our general qualifications are designed to prepare students for a wide range of occupations and further study whilst assessing a wide range of competences.

The subject criteria have been assessed to ensure they test specific competences. The skills or knowledge required do not disadvantage particular groups of students.

Exam access arrangements are available for students with disabilities and special educational needs.

We comply with the *UK Equality Act 2010* to make reasonable adjustments to remove or lessen any disadvantage that affects a disabled student. Information about access arrangements will be issued to schools when they become OxfordAQA centres.

6.7 Working with OxfordAQA for the first time

You will need to apply to become an OxfordAQA centre to offer our specifications to your students. Find out how at **oxfordaqa.com/centreapprovals**

6.8 Private candidates

This specification is not available to private candidates.

7 Appendix: Links to maths and science

Through their work in design and technology, students must apply relevant knowledge, skills and understanding from courses in the sciences and maths.

They should use the metric and International System of Units (SI) system but also be aware that in some countries some materials and components retain the use of imperial units.

Through the assessment of their knowledge and understanding of technical principles students must demonstrate an understanding of the mathematical and scientific requirements shown in the following tables.

The examples in the tables below show how the mathematical skills and scientific knowledge and skills identified could be applied in design and technology.

7.1 Links to mathematics

Students must be able to apply the following mathematical skills.

1 Arithmetic and numerical computation

Reference	Mathematical skills requirements	Examples of design and technology applications
1a	Recognise and use expressions in decimal and standard form.	Calculation of quantities of materials, costs and sizes.
1b	Use ratios, fractions and percentages.	Scaling drawings, analysing responses to user questionnaires.
1c	Calculate surface area and volume.	Determining quantities of materials.

2 Handling data

Reference	Mathematical skills requirements	Examples of design and technology applications
2a	Presentation of data, diagrams, bar charts and histograms.	Construct and interpret frequency tables; present information on design decisions.

3 Graphs

Reference	Mathematical skills requirements	Examples of design and technology applications
3a	Plot, draw and interpret appropriate graphs.	Analysis and presentation of performance data and client survey responses.
3b	Translate information between graphical and numeric form.	Extracting information from technical specifications.

4 Geometry and trigonometry

Reference	Mathematical skills requirements	Examples of design and technology applications
4a	Use angular measures in degrees.	Measurement and marking out, creating tessellated patterns.
4b	Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects.	Graphic presentation of design ideas and communicating intentions to others.
4c	Calculate areas of triangles and rectangles, surface areas and volumes of cubes.	Determining the quantity of materials required.

7.2 Links to science

Students must know and apply the following scientific knowledge and skills.

1 Use scientific vocabulary, terminology and definitions

Reference	Scientific knowledge and skills	Examples of design and technology applications
1a	Quantities, units and symbols.	Appropriate use of scientific terms when developing a design brief and specifications.
1b	SI units (e.g. kg, g, mg; km, m, mm; kJ, J), prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano).	Calculation of quantities, measurement of materials and selection of components.
1c	Metals and non-metals and the differences between them, based on their characteristic physical and chemical properties.	Classification of the types and properties of a range of materials.

2 Life cycle assessment and recycling

Reference	Scientific knowledge and skills	Examples of design and technology applications
2a	The basic principles in carrying out a life-cycle assessment of a material or product.	Selection of materials and components based on ethical factors, taking into consideration the ecological and social footprint of materials.

3 Using materials

Reference	Scientific knowledge and skills	Examples of design and technology applications
3a	The conditions which cause corrosion and the process of corrosion and oxidisation.	Understanding the properties of materials and how they need to be protected from corrosion through surface treatments and finishes.
3b	The composition of some important alloys in relation to their properties and uses.	Selecting appropriate materials.
3c	The physical properties of [materials], how the properties of materials are selected related to their uses.	Knowledge of properties of materials to be applied when designing and making.
3d	The main energy sources available for use on Earth (including fossil fuels, nuclear fuel, bio-fuel, wind, hydro-electricity, the tides and the Sun), the ways in which they are used and the distinction between renewable and non-renewable sources.	Understanding of how to choose appropriate energy sources.
3e	The action of forces and how levers and gears transmit and transform the effects of forces.	Knowledge of the function of mechanical devices to produce different sorts of movement, changing the magnitude and direction of forces. Mechanical advantage. Stress and strain in materials. Velocity ratios in mechanisms.

OXFORD AQA
INTERNATIONAL QUALIFICATIONS

Fairness *first*

Thank you for choosing OxfordAQA, the international exam board that puts fairness first.

Benchmarked to UK standards, our exams only ever test subject ability, not language skills or cultural knowledge.

This gives every student the best possible chance to show what they can do and get the results they deserve.

Get in touch

You can contact us at *oxfordaqa.com/contact-us* or email *info@oxfordaqa.com*

OxfordAQA International Qualifications
Great Clarendon Street
Oxford OX2 6DP
United Kingdom