

OxfordAQA

International GCSE

Design and Technology: Product Design (9252)

Two-year Scheme of work

For teaching from September 2023 onwards
For International GCSE exams in June 2025 onwards.

Introduction

This outline scheme of work is intended to help teachers plan and implement the teaching of the Oxford AQA International GCSE Design and Technology: Product Design (9252) specification. The purpose of this outline scheme is to provide advice and guidance to teachers, not to prescribe and restrict their approach to the specification. It has been produced by a practicing subject teacher. There are obviously many other ways of organising the work, and there is absolutely no requirement to use this scheme.

Assumed coverage

Eg This scheme of work is based on a two year international GCSE course with approximately 120-140 guided learning hours (GLH), though this varies according to local practice and the learner's prior experience in the subject.

Year 1 focuses on the specification content which is assessed in Paper 1, incorporating opportunities for practice non-exam assessment (NEA) style project work. Year 2 focuses on the NEA which will be assessed and revision.

Contents

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Year 1 Term 1

Week 1

Key ideas

- Robotics, automation, and production in industry.
- Production techniques and systems – automation.

Specification content

- New and emerging technologies 3.1.1

Teaching and learning activities and resources

When focusing on **robotics, automation and production in industry**:

- Examine a case study:
 - Watch [a video about automation in a car factory](#) (11 minutes) video clip about automated production.
 - Look at an example factory such as Jaguar Land Rover/BMW.

To consolidate learning, in groups students discuss the benefits and disadvantages of being a fully automated manufacturing system and the use of robotics.

When focusing on **production techniques and systems**:

- Use the following key terms to discuss production methods in industry:
 - Computer Aided Design (CAD)
 - Computer Aided Manufacture (CAM)
 - Flexible Manufacturing (FMS)
 - Just in time (JIT)
 - Lean Manufacturing.
 - Give students examples of where these production techniques and systems may be used.

To consolidate learning, students discuss the benefits and disadvantages of each.

Week 2

Key ideas

- Enterprise
- Market pull and technology push
- People, society and culture.

Specification content

- New and emerging technologies 3.1.1
- Design Strategies 3.3.3
- Communication of design ideas 3.3.4.

Teaching and learning activities and resources

When focusing on **enterprise and market pull and technology**:

- Discussion of different methods of creating business and making a product successful.
- Watch [video on Co-operatives explained](#) (2 minutes)
- Watch [Fairtrade cotton in Cameroon](#) (9 minutes)
- Discussion of different methods of creating business and making a product successful.
- Discussion of market pull and technology push. Look at the following products and discuss how far market pull and technology push have influenced their development:
 - iPhone / smart phones
 - wind-up radio.
 - Sports equipment which use the material D30.
- Discussion of raising funds to start a business. Give examples of when this has been successful.
- Ask students what they understand by virtual marketing and retail and them to name examples that they have experienced.

To consolidate learning, students discuss cooperatives and their benefits to communities of people.

When focusing on **design strategies and communication of design ideas**:

- Look at a range of objects that have been designed with a specific user group in mind. These user groups may include different age groups, interest groups or be based on gender (the pink tax).
- Discuss/create of a mind map demonstrating what issues these groups may have with specific products and what their specific needs might be.
- Students take a product and redesign it in order to make it more suitable for a specific group.

In completing the above, encourage students to focus on freehand sketching techniques; this could include the use of colour/markers.

Week 3

Key ideas

- Sustainability and the environment
- Critical evaluation of new and emerging technologies – planned obsolescence
- Design for maintenance
- Ethics
- The environment.

Specification content

- New and emerging technologies 3.1.1

Teaching and learning activities and resources

When introducing students to the key ideas outlined above:

- Annotation of designs including specific materials and processes where known.
- Learning of key terms and meanings:
 - finite and non-finite resources, the disposal of waste, pollution and global warming
 - efficient working
 - planned obsolescence, design for maintenance.

To consolidate learning, annotate designs in terms of their sustainability.

To further develop their understanding of these ideas:

- Conduct a group analysis of designs in terms of impact on the environment. Discussion of finite and non-finite resources, the disposal of waste, pollution and global warming.
- How have the following designs been made with the environment in mind?
 - bamboo bike
 - reusable cloth shopping bag.
- Use of life cycle assessment to understand the impact on the environment.

Challenge – how could a product be developed/re-designed to lessen the environmental and ethical impact?

Week 4

Key ideas

- Ethics
- Renewable and non-renewable resources
- Nuclear energy
- Energy storage
- Kinetic pumped storage systems
- Alkaline and rechargeable batteries.

Specification content

- New and emerging technologies 3.1.1
- Energy generation and storage 3.1.2

Teaching and learning activities and resources

- Evaluation of the ethical considerations surrounding a design/product.
- Investigation into production methods, use of labour, sourcing materials to provide us with the products we need.

Students investigate ethical issues surrounding large companies such as Dyson, Coca Cola and Primark in relation to the responsibility of the designer/maker. Product study used to focus on these areas (Dyson, Coca cola, Primark).

When focusing on **renewable and non-renewable resources in their study of energy generation and storage**, ask students to:

- Highlight the difference between renewable and non-renewable fuels. Give advantages and assess prior knowledge.
- Discuss key terminology including renewable and non-renewable fuels, fossil fuels, wind, solar, tidal, hydro-electrical, biomass, coal, gas, oil.
- Complete the [Moja island activity](#):
Students consider the variety of different options available to communities living on Moja Island and select the most appropriate technology. Renewable energy fact cards, a map of the island and information on the different communities and their needs are all resources designed to help them.

When focusing on **nuclear energy and different energy storage systems**, ask students to:

- Discuss the arguments for and against nuclear power (possible debate). Explain how it impacts local communities.
- Give information about nuclear power plant disasters such as Fukushima and how they are avoided.
- Images of different energy storage – discuss how they work and the types of energy stored.

To consolidate learning, students create a mind map of all their learning in this topic to revise their understanding.

Week 5

Key ideas

- Systems
- Types of motion.

Specification content

- Systems approach to designing 3.1.4
- Mechanical devices 3.1.5

Teaching and learning activities and resources

When focusing on **the systems approach to designing**:

- Use whiteboards to define the terms input, process and output in a system.
- A systems diagram or product given to groups to identify each of these parts of the system.

To consolidate learning, in groups, students are given scenarios and a systems solution to be designed. The identification of input, process and output in their idea/product to be explained and presented to peers.

When focusing on **types of motion in the study of mechanical devices**:

- Define the term mechanism.
- Give an example of a mechanism and assess students' knowledge of why mechanisms are used.
- Demonstrate the 4 main types of motion – in pairs think of as many examples of products that use these motions.

To consolidate learning, produce a visual revision aid showing movement and mechanisms.

Week 6

Key ideas

- Types of motion
- Modern materials
- Smart materials.

Specification content

- Mechanical devices 3.1.5
- Developments in new materials 3.1.3

Teaching and learning activities and resources

In continuing the previous week's study of mechanical devices:

- Discuss ways of changing one type of motion into another.
- Identify specific mechanisms such as levers, linkages and rotary systems.
- In small groups students model examples of these mechanisms and understand how they work (using card, split pins etc...) worksheets and instructions could be used to assist this activity.
- Identify where these mechanisms can be found in products/machines we use.
- Learn how to create and understand diagrams that show motion. This may include calculations and measurement.
- Opportunities to visit maths links – use of ratios, measuring of degrees etc.

When focusing on **developments in new materials**, provide students with:

- An introduction to the three key developments in materials (modern, smart and composite materials). They can match the correct definition to the term to assess prior knowledge.
- Examples of materials and/or products made from modern materials. They can identify and briefly analyse these, considering the properties and reason for their use.
- Students can then complete a demonstration of smart materials found in everyday products.

To consolidate learning, students make revision cards made for each material area.

Week 7

Key ideas

- Composite materials
- Material properties.

Specification content

- Developments in new materials 3.1.3
- Materials and their working properties 3.1.6

Teaching and learning activities and resources

When focusing on **composite materials**:

- Cards showing images of products made from composite materials to be matched to cards labelled with the constituent materials.
- Definition of composites re-visited and questioning used to understand the importance of each constituent material.
- Understanding of this term and examples shown in real life context.

To consolidate learning, students make revision cards for this material area.

When focusing on **materials and their working properties**:

- Definitions for key properties (strength, toughness, hardness etc) are given and students use note-taking skills to understand these.
- Worksheet/revision cards – headings of paper, board, hardwood, softwood, manufactured board given and students to list as many examples under each (assessing prior knowledge).
- Pre-prepared research packs used for students to read, sift and note- take information for each of the categories outlined.
- Examples of each material (as a swatch for students to look through) given to students in groups. The named example material needs to be matched with the properties of that material.
- Students then have to justify the matches they have made.
- Possible game of 'Top Trumps'.

To consolidate learning, students discuss in what product each material might be used.

Week 8

Key ideas

- Material properties.

Specification content

- Materials and their working properties 3.1.6

Teaching and learning activities and resources

- Card sort – headings of ferrous, non-ferrous, alloys, given and students to list as many examples under each (assessing prior knowledge).
- Pre-prepared research packs used for students to read, sift and note take information for each of the categories outlined.
- Worksheet/revision cards – thermoforming, thermosetting polymers given and students to list as many examples under each (assessing prior knowledge).
- Examples of each material (for students to look through) given to students in groups. The named example material needs to be matched with the properties of that material.

To consolidate learning, students then have to justify the matches they have made.

Example NEA style project

Example NEA style project to cover the next section of the specification: 3.2 Section B – Project 1 Storage.

This NEA project introduces the idea of iterative thinking, and is the focus on weeks 9 – 19 below

Each specialist technical principle should be delivered through **at least one** material category listed in the specification.

Week 9

Key ideas

- Functionality
- Aesthetics
- Environmental factors
- Availability
- Cost
- Social factors
- Ethical factors.

Specification content

- Selection of materials or components 3.2.1
- How materials are used in products 3.2.5

Teaching and learning activities and resources

When focusing on the key ideas described above:

- Primary investigation of material area/s through product analysis – students can access their main taught material area as well as revise the range of other materials from the core section. Range of products analysed in terms of the choice of materials by the designer, beginning to identify characteristics, properties, and environmental factors etc... which justify their use.
- Assess existing knowledge of materials, building on less familiar areas. Key terms covered and discussed.
- Assess materials knowledge through practical application. A basic phone stand/holder to be built – no designing, students experiment with materials and recall knowledge. Material properties and how to work with them is re-visited and assessed.
- Discussion of alternative materials and how their functionality would differ in terms of this project.
- Exploration of materials drawing on prior knowledge and understanding.

There is an opportunity to emphasise links with maths here (eg calculation of material costs.)

Week 10

Key ideas

- Functionality
- Aesthetics
- Environmental factors
- Availability
- Cost
- Social factors
- Ethical factors
- Designing:
 - sketching
 - modelling
 - testing
- Evaluation of work.

Specification content

- Selection of materials or components 3.2.1
- How materials are used in products 3.2.5
- Communication of ideas 3.3.4

Teaching and learning activities and resources

When continuing the study of the key ideas explored in week 9:

- Assess materials knowledge through practical application.
- Continue building a basic phone stand/holder– no designing, students experiment with materials and recall knowledge.
- Exploration of materials drawing on prior knowledge and understanding.
- Potential for a small range of materials to be explored.
- Evaluation of outcomes identifying successes and areas for development. Questions used as starting points for discussion – questions linking to functionality, aesthetics, environment, availability, cost, social and ethical factors.

As in week 9, emphasise the opportunities to visit maths links.

When focusing on **the communication of ideas through sketching, modelling, testing, and evaluating work**:

- Explore and develop initial ideas for storage project.
- Different drawing techniques explored and experimented with.
- Materials and key areas analysed.

Week 11

Key ideas

- The six Rs
- Ecological issues in design and manufacture
- Designing:
 - sketching
 - modelling
 - testing
- Evaluation of work.

Specification content

- Ecological and social footprint 3.2.3
- Design Strategies 3.3.3
- Communication of ideas 3.3.4

Teaching and learning activities and resources

When focusing on **issues relating to ecological and social footprints**:

- Recall of the six Rs (Reduce, Refuse, Re-use, Repair, Recycle and Rethink)
- Introduce the idea of products having a carbon footprint, understanding what adds to this footprint – case study of the mobile phone to demonstrate a real-life application.

To consolidate learning, students conduct self and peer evaluation of storage proposals developed in week 10 against the six Rs and possible carbon footprint that could incur.

- The initial ideas for their storage project are then enhanced and an iterative approach is adopted. Ideas are modified to encompass the learning of the six Rs and mileage of a product being understood.

Students may be stretched here by exploring alternative drawing skills.

Week 12

Key ideas

- Properties of materials
- Modifying properties for a purpose.

Specification content

- How materials are used in products 3.2.5

Teaching and learning activities and resources

When focusing on **properties of materials**:

- Explanation of key terms – working properties, physical properties.
- Match up activity of three categories. Cards showing product image to be matched with card stating material name to be matched with card listing properties.

To consolidate learning, an existing storage product analysed and properties identified.

When focusing on modifying properties for a purpose:

- Assessing prior knowledge of ways to change properties.

To consolidate learning, students could conduct material sampling/testing to understand the benefits of modifying properties.

Week 13

Key ideas

- Commercially available types and sizes of materials
- Designing:
 - sketching
 - modelling
 - testing
- Evaluation of work.

Specification content

- Sources and origins 3.2.4
- Stock forms types and sizes 3.2.6

Teaching and learning activities and resources

When focusing on **commercially available types and sizes of materials**:

- Focus on understanding how primary sources are converted into workable forms.
- Match-up of primary source of material, conversion process and workable material. Key terms may be filed in as a revisit exercise from the prior learning.
- Stock sizes and availability investigated in main material area. Advantages for purchasing in stock form considered.

Once again there are opportunities to visit maths links here, through calculating area, volume, nesting and minimising waste.

- Reflecting on and revisiting knowledge of:
 - properties
 - property modification
 - stock sizes.
- Discussion of scales of production.

Students can then return to their project, modifying their storage idea in order to make part of the product in quantity. This requires them to show understanding stock sizes and apply this knowledge.

Week 14

Key ideas

- Manufacturing specification/working drawings
- Tools, equipment and processes
- Quality control.

Specification content

- Investigation, primary and secondary data 3.3.1
- Communication of ideas 3.3.4
- Specialist techniques and processes 3.2.8
- Material Management 3.3.8

Teaching and learning activities and resources

In focusing on **manufacturing specifications and working drawings**:

- Discussion of manufacturing specifications and working drawings etc.
 - Techniques tried to differing levels according to the ability and experience of students.
- Once again, emphasise opportunities to visit maths links – calculating quantities of materials, cost and sizes.

In focusing on tools, equipment, processes and quality control:

- Manufacture of prototype.
- Marking out material discussed and demonstrated.
- Production aids discussed where relevant and examples shown according to material area.
- Use of production aids where appropriate.
- Use a range of appropriate tools and equipment to shape, fabricate construct and assemble.

Once again, emphasise opportunities to visit maths links – scaling of drawings, working to datums.

Year 1 Term 2

Week 15

Key ideas

- Tools, equipment and processes
- Quality control
- How materials are cut shaped and formed to a tolerance.

Specification content

- Specialist techniques and processes 3.2.8
- Material management 3.3.8

Teaching and learning activities and resources

- Continue with manufacture of prototype.
- Use of production aids where appropriate.
- Use a range of appropriate tools and equipment to shape, fabricate construct and assemble.

Week 16

Key ideas

- How materials are cut, shaped and formed to a tolerance
- Quality control.

Specification content

- Specialist techniques and processes 3.2.8
- Tolerances 3.3.7

Teaching and learning activities and resources

- Continue with manufacture of prototype.
- Introducing tolerance, linking to quantity production (3.2.7).

Give examples of where tolerances may be used in other products. Ask students to consider what acceptable tolerances might be for their own project.

Once again, continue to emphasis opportunities to visit maths links – nesting exercise eg How many of a product of size x can you fit onto a piece of materials size y ?

Week 17

Key ideas

- Quality control.

Specification content

- Specialist techniques and processes 3.2.8
- Tolerances 3.3.7

Teaching and learning activities and resources

- Continue with manufacture of prototype.
- Discussion about the difference between quality control and quality assurance.
- Application and use of quality control (QC) to include measurable and quantitative systems (see specification for examples from each material area). Students identify times when they have performed QC checks and what they can do to ensure the quality in their current project.

To consolidate learning, discuss what learning has taken place due to these checks. How could the project be improved?

Week 18

Key ideas

- The preparation and application of surface treatments and finishes
- Quality control.

Specification content

- Surface treatments and finishes 3.2.9

Teaching and learning activities and resources

- Continue with manufacture of prototype.
- Understand how treatments and finishes can enhance the functional and aesthetic properties of materials.
- Using a selection of common materials in the projects students are completing, demonstrate a range of treatments and finishes.
- Students write notes and answer questions on the different techniques, discussing the benefits of each in different circumstances.
- Students discuss in pairs the possible techniques they can use to complete their projects
- Students try a range of techniques through mini practical sessions.

To consolidate learning, students apply this knowledge and understanding to their own prototype.

Week 19

Key ideas

- The preparation and application of surface treatments and finishes
- Quality control.

Specification content

- Surface treatments and finishes 3.2.9

Teaching and learning activities and resources

- Manufacture of prototype
- Students continue to complete making tasks in the materials and processes they have selected for their design.

To consolidate learning, students are encouraged to reflect on their designs in the final stages. How could their designs be improved? What skills do they need to work on? How would this product be commercially manufactured?

Week 20

Key ideas

- Types of forces and reinforcing materials
- Manipulating materials to resist/work with forces.

Specification content

- Selection of materials or components 3.2.1
- Forces and stresses 3.2.2

Teaching and learning activities and resources

- Watch [video - How it works: Skyscrapers](#) (7 minutes)
- Key forces defined and explained.
- Identification of products being designed to withstand/resist certain forces (bridges, cars, textiles).

Look at and show examples of reinforcing materials used within the classroom.

Practical experimentation with material. Testing materials to understand how they can resist/withstand forces applied to them.

Example NEA style project

- Example NEA style project to cover 3.3 Section C – Project 2 (lighting).
- Building iteration into a project in preparation for the NEA.

Week 21

Key ideas

- Investigation, primary and secondary data.

Specification content

- Use primary and secondary data to understand client/or user need 3.3.1

Teaching and learning activities and resources

- Independent research into existing products. Lighting examples are explored and analysed
- Understanding the market, the trends and lighting currently available.
- Presentation of research and findings.
- Note taking skills employed to broaden knowledge of existing products
- Questioning used to assess knowledge gained.
- Product analysis of a range of current products
- Opportunities to visit maths links – comparative chart of performance criteria.

Week 22

Key ideas

- Generating imaginative and creative designs

Specification content

- Design strategies 3.3.3
- Communication of design ideas 3.3.4.

Teaching and learning activities and resources

- Students identify a user/client and discuss briefly their needs and wants.
- Explore and develop ideas for a lamp using sketching and modelling techniques.
- Existing product research to be used for inspiration
- Constant discussion about what needs to be researched as a direct response to the ideas students generate.
- Explore and develop ideas for a lamp using sketching and modelling techniques.

Freehand sketching, 2D and 3D drawings used to communicate, system and schematic drawings, annotated drawings that fully explain detailed conceptual stages.

Week 23

Key ideas

- Using primary and secondary data to understand client and/or user needs.
- Market research, interviews, human factors
- Constraints that are presented to designers.

Specification content

- Investigation, primary and secondary data 3.3.1
- Environmental, social and economic challenge 3.3.2

Teaching and learning activities and resources

- Client/user interviewed where possible. Discussion about what information students want to get from their client and how to write good interview questions.
- Discussion of the difference between anthropometrics and ergonomics.
- Practical examples relating to real products discussed and students consider the data needed to inform their designs.
- Percentile graphs discussed and analysed and how to use this data.
- Own data found and analysed.
- Opportunities to visit maths links – presentation of client survey responses.

Percentile ranges used in anthropometrics and/or ergonomics.

- Discussion of students' own ideas of their ethical responsibilities as a designer. What would they do to ensure these were considered in the manufacture of their design?

Students add notes to their designs and continue developing this.

Week 24

Key ideas

- How to write a design brief
- Generating imaginative and creative designs.

Specification content

- Investigation, primary and secondary data 3.3.1
- Design strategies 3.3.3
- Communication of design ideas 3.3.4

Teaching and learning activities and resources

- Reflect and re-visit investigation work – analyse and evaluate findings.
- Produce a design brief based upon market research and client findings.
- Students should consider their own needs, wants and interests and those of others.
- Students consider why a designer considers alterations to a brief and modifies the brief as required.
- Peer assessment activities used to finalise the brief.

Opportunities to visit maths links – frequency tables and percentile ranges.

- Further explore and develop ideas for a lamp using sketching and modelling techniques.
- Lighting to reflect their ethical considerations and market research.
- Iterative designing being understood as designs are re-visited and developed based on building knowledge.
- Freehand sketching, 2D and 3D drawings used to communicate, system and schematic drawings, annotated drawings that fully explain detailed conceptual stages.
- Students interview their client and ask them about their design ideas.

Opportunities to visit maths links – measurements, scale drawings.

Week 25

Key ideas

- Generating imaginative and creative designs
- How to write a design specification.

Specification content

- Investigation, primary and secondary data 3.3.1
- Design strategies 3.3.3
- Communication of design ideas 3.3.4

Teaching and learning activities and resources

- Further explore and develop ideas for a lamp using sketching and modelling techniques. Students reflect on their clients' opinion of their ideas.
- Lighting to reflect their ethical considerations and market research.
- Iterative designing being understood as designs are re-visited and developed based on building knowledge.

Freehand sketching, 2D and 3D drawings used to communicate, system and schematic drawings, annotated drawings that fully explain detailed conceptual stages.

- Analysis of all investigation work carried out.
- Use of math skills to compare and present data.

Analysis used to produce a design specification.

Week 26

Key ideas

- Generating imaginative and creative designs
- Isometric and perspective designs
- Exploded diagrams
- Working drawings
- Computer-based tools
- Audio and visual recordings
- Modelling.

Specification content

- Design Strategies 3.3.3
- Communication of design ideas 3.3.4

Teaching and learning activities and resources

Further embedding of the iterative design process required in the NEA through design development and moderation.

- Demonstration and scaffolding techniques used to develop one or more of the methods of communication. Building on prior knowledge to enhance these skill sets.

Design solutions communicated for interpretation by the client/user.

Week 27

Key ideas

- Isometric and perspective designs
- Exploded diagrams
- Working drawings
- Computer-based tools
- Audio and visual recordings
- Modelling
- Satisfy the requirements of the brief
- Functionality
- Aesthetics
- Potentially marketable.

Specification content

- Communication of design ideas 3.3.4
- Prototype development 3.3.5

Teaching and learning activities and resources

- Demonstration and scaffolding techniques used to develop one or more of the methods of communication. Building on prior knowledge to enhance these skill sets.

Design solutions communicated for interpretation by the client/user.

- A product or system is prototyped to show the client/user the lighting outcome.
- Materials are used and chosen reflecting their knowledge and understanding of this area.
- The process of prototyping helps to develop the lighting solution further and client/user feedback can form the basis of this development.

Evaluation and reflection are used to decide whether the prototype is fit for purpose. Peer and self-assessment could be used as a tool to achieve this.

Week 28

Key ideas

- Materials are selected based on functionality, cost and availability.

Specification content

- Selection of materials and components 3.3.6

Teaching and learning activities and resources

- Assessment of chosen material area – recapping prior learning
- Use of research or costing sheets to decide on the most appropriate materials for the lighting solution.
- Re-visit 3.2.5 (using and working with materials)
- 3.2.6 (stock sizes).

Planning out materials for the final prototype manufacture.

Week 29

Key ideas

- Working accurately
- Cutting, shaping and forming materials to tolerance
- Planning the cutting of materials to minimize waste (linking to tolerance)
- Using measuring and marking out to create an accurate and quality prototype.

Specification content

- Selection of materials and components 3.3.6
- Tolerances 3.3.7
- Material management 3.3.8

Teaching and learning activities and resources

- Use of maths questions in past papers to revisit tolerances and its use in Design Technology.
- Activity used to introduce the concept of nesting/ tessellation – differentiation of shapes/parts and sizes.
- Application of tolerance and nesting/tessellation to make template pieces/jigs/aids to begin to mark out materials for the final prototype.
- Other quality control processes considered and examples used of how quality control is done in industry.

Opportunities to visit maths links – SI units, accurate use of tolerances, decimal and standard forms, surface areas and volume, datum points and coordinates, tessellation.

- Consideration of potential materials that could be used. These will include:
 - functional need
 - cost
 - availability.
- All pieces for the lighting prototype to be measured and marked out.

Use of peer assessment/feedback to check the accuracy, tolerance and amount of waste that would be generated.

Week 30

Key ideas

- Selection of the correct hand tools and machinery
- Safe use of tools
- Selection and use of specialist techniques (used to shape, fabricate, construct).

Specification content

- How materials are used in products 3.2.5
- Specialist tools and equipment 3.3.9
- Specialist techniques and processes 3.3.10

Teaching and learning activities and resources

- Key processes using tools and equipment discussed, building on prior knowledge.
- In pairs students could demonstrate different tools and equipment explaining key health and safety and quality control techniques.
- Diary/planning activity used to ensure independent progress and learning. Assesses and re-visits processes, tools and techniques.

Final prototype produced to a high standard – re-visiting the application of quality control to achieve this (3.2.8).

- Key processes using tools and equipment discussed building on prior knowledge.
- Diary/planning activity used to ensure independent progress and learning. Assesses and re-visits processes, tools and techniques.

Week 31

Key ideas

- Preparing a material for a surface finish
- Applying a surface finish.

Specification content

- Surface treatments and finishes 3.3.10

Teaching and learning activities and resources

- Experimentation of different surface treatments and finishes.

Students discuss benefits of each and show justification for their decisions.

Week 32

Key ideas

- Selection of the correct hand tools and machinery.
- Safe use of tools
- Selection and use of specialist techniques (used to shape, fabricate, construct)
- Preparing a material for a surface finish
- Applying a surface finish.

Specification content

- How materials are used in products 3.2.5
- Specialist tools and equipment 3.3.9
- Specialist techniques and processes 3.3.10
- Surface treatments and finishes 3.3.10

Teaching and learning activities and resources

- Key processes using tools and equipment discussed building on prior knowledge.
- Diary/planning activity used to ensure independent progress and learning. Assesses and re-visits processes, tools and techniques.

Final prototype produced to a high standard – re-visiting the application of quality control to achieve this (3.2.8).

Week 33

Key ideas

- Selection of the correct hand tools and machinery.
- Safe use of tools
- Selection and use of specialist techniques (used to shape, fabricate, construct)
- Preparing a material for a surface finish
- Applying a surface finish.

Specification content

- Specialist tools and equipment 3.3.9
- How materials are used in products 3.2.5
- Specialist techniques and processes 3.3.10
- Surface treatments and finishes 3.3.10.

Teaching and learning activities and resources

- Key processes using tools and equipment discussed building on prior knowledge.
- Diary/planning activity used to ensure independent progress and learning. Assesses and re-visits processes, tools and techniques.
- Final prototype produced to a high standard – re-visiting the application of quality control to achieve this (3.2.8).

Year 10 Term 3

Week 34

Key ideas

- Selection of the correct hand tools and machinery.
- Safe use of tools
- Selection and use of specialist techniques (used to shape, fabricate, construct)
- Preparing a material for a surface finish
- Applying a surface finish
- How materials can be altered to change their properties.

Specification content

- How materials are used in products 3.2.5

Teaching and learning activities and resources

- Students look at a range of different materials that they have used in previous projects.
- Recap of properties and discussion of what students have found when using certain materials.
- Product analysis of hand-made products within your material area/s of interest.
- Consider reasons why the designer has chosen these materials.

What tools and equipment have been used to manufacture these products? Why have they chosen these tools and equipment?

What are the issues relating to these processes? How will the manufacturer ensure good quality control?

- Students look at the products considered in the previous session. They consider how this product could be improved.
- Consideration of ways that materials can be modified to make them more suitable for purpose eg additives, stabilisers etc.

Students then redesign this product using different materials, form and by modifying materials to change their properties.

Week 35

Key ideas

- Scales of production
- Commercial processes.

Specification content

- Scales of production 3.2.7
- Specialist techniques and processes 3.2.8

Teaching and learning activities and resources

- Consideration of commercial processes using video clips etc.
- Students consider what processes could be used in the production of their modified designs.

Students discuss the benefits of these commercial processes in terms of mass of batch production.

Week 36

Teaching and learning activities and resources

Students look at a range of products and discuss features of the designs that make them suitable for mass production.

Week 36 – 38

Students work on their NEA.

Year 11 Term 1

Year 11 term 1 will be spent on the NEA.

It's intended to be an iterative process so the learning activities will be directed by the student and will depend on their project.

Year 11 Term 2

Week 13

Mock exams.

Week 13–18

NEA

Week 19–24

Revision

Year 11 Term 3

Revision