# CIM - Curriculum Intent Map Product Design
# Exam board - GCSE: OCR Camb Nat  Exam board – OCR Camb Tech

### Why study Engineering

### Subject Content

### Assessment (KS3)

Students are assessed through a combination of written work and holistic grading of practical work. Students complete one Engineering unit in Year 9 to introduce key skills, processes and technical knowledge, providing a strong foundation for progression into KS4 Engineering.

### Assessment (GCSE and A 'Level)

The OCR Cambridge National in Engineering Manufacture at KS4 and the Cambridge Technical in Engineering at KS5 are assessed through a combination of Non-Exam Assessment (NEA) and written examination papers. This allows students to demonstrate both their theoretical knowledge and their practical engineering skills.

### Curriculum equality and access

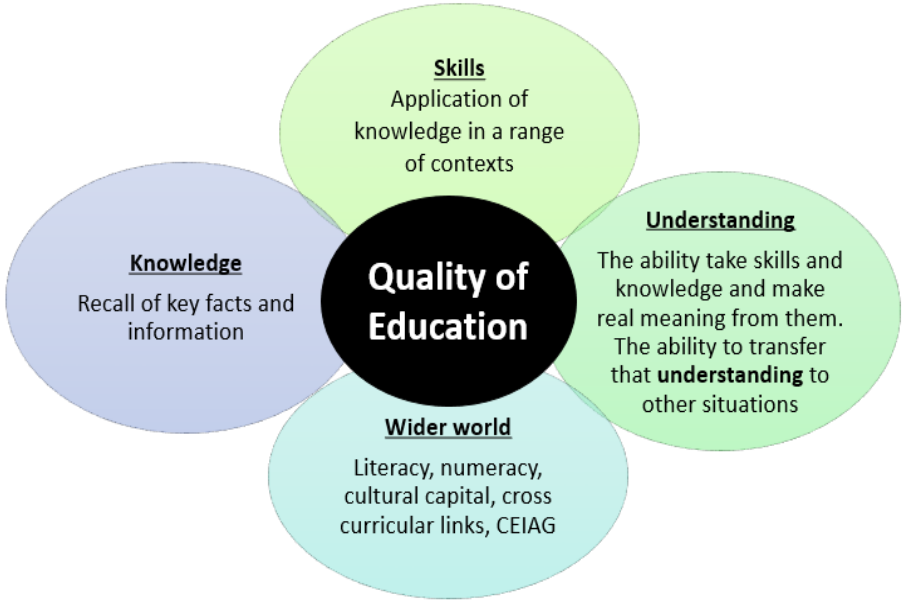
All assessments are administered carefully to ensure that all learners are treated fairly.
All learners have equitable opportunity to access the qualifications and assessments, and that the qualification is awarded in a way that is fair to every learner. All learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

**Extracurricular activities** **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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**What are the objectives for your curriculum?**

**What do you want pupils to be able to know and do by the time they leave?**




**How does your curriculum plan set out the sequence and structure of how it's going to be implemented?**

Curriculum knowledge is interleaved by revisiting key concepts such as materials, manufacturing processes, CAD/CAM, health and safety, quality control and engineering mathematics across different projects and units. This enables students to apply prior knowledge in new contexts and build increasingly secure technical understanding over time.

**Why is it shaped the way it is? What values have guided your decisions about the curriculum you have in place?**

**How does your curriculum reflect your school's context?**

The content of Engineering requires students to apply mathematical and scientific knowledge, understanding and practical skills. This reflects the importance of Engineering as a key STEM subject, combining technical knowledge, problem-solving and real-world application.

**To what extent have you made these objectives clear? Does everybody know them?**

These objectives are regularly reinforced at KS4 and fully embedded within KS3 lessons. The objectives are signposted in lessons as and when required.

**How does your curriculum reflect national policy (for example, British values and PSHE)? How do you ensure that curriculum knowledge is interleaved?**

The Engineering curriculum reflects national priorities through regular consideration of sustainability, ethical manufacturing, health and safety, equality and the wider social and environmental impact of engineering decisions. Students discuss global issues such as material sourcing, energy use, waste reduction and responsible manufacturing, while also developing teamwork, resilience and respect for others.

**How does your curriculum cater for disadvantaged and minority groups? How do you ensure these pupils aren't 'shut out' of pursuing subjects they wish to study because of too sharp a focus on exam results**

**Extracurricular activities**  **Careers links**  **Curriculum links**  **Threshold topics (bold)**  **PSHE, PD and cultural capital links**

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Design projects are chosen to be accessible and engaging for all learners, particularly at KS4 for the NEA and students are supported and resources differentiated to support ALL pupils in the subject area.

**Meeting the needs of SEND students within the classroom**

**Intent:**

- Identification of key fundamental building blocks based on student need

**Implementation:**

- Knowledge of SEND need - knowing who they are, targeted T&L and classroom strategies to meet need.
- Staff trained to meet needs of SEND students specifically to their subject area
- Differentiated teaching and resources based on identified needs
- Targeted live marking and questioning
- Deploying TA's to support wider group to allow subject specialist support for SEND (helicopter approach)
- Personalised home learning
- Access arrangements – identification and application
- **Impact:**
- Grading below Grade 1 to monitor progress
- Structured accessible assessments.

| | Knowledge | Skills | Understanding | Wider world |
|---|---|---|---|---|
| Year 13 | • | • | | |
| Year 12 | • | • | • | • |
| Year 11 | | | | |

**Extracurricular activities**  **Careers links**  **Curriculum links**  **Threshold topics (bold)**  **PSHE, PD and cultural capital links**

# CIM - Curriculum Intent Map Product Design

## Exam board - GCSE: OCR Camb Nat  Exam board – OCR Camb Tech

| | | | | |
|---|---|---|---|---|
| **Year 10** | | | | • |
| **Year 9** | Students will rotate throughout the year, completing one rotation each in Food, Product Design, Engineering, IT, and Computing (two lessons per week). | | | |
| | **Passive Speaker (engineering)**<br>• Properties and uses of hardwoods, softwoods and manufactured boards<br>• Principles of acoustic amplification through shape and material<br>• CAD modelling for design development and manufacturing plans<br>• Safe use of workshop tools, machinery, and finishing techniques | **Passive Speaker (engineering)**<br>• Use CAD software to model and plan manufacture<br>• Measure, mark out, cut, and assemble wooden components accurately<br>• Operate tools and equipment safely and precisely<br>• Apply high-quality finishing techniques<br>• Test, evaluate, and refine design for performance and presentation | **Passive Speaker (engineering)**<br>• How material choice and shape affect sound performance<br>• How precision and accuracy impact quality and function<br>• How CAD and CAM support modern manufacturing processes<br>• Understanding how materials and structure affect sound and strength | • **Science** – sound waves, resonance, and vibration<br>• **Physics** – electrical energy and circuits<br>• **Maths** – measurement, angles, and geometry<br>• Ethical design and environmental impact<br>• Global material sourcing and fair production<br>• Creative identity and individuality in design<br>• CAD/3D printing enrichment<br>• Product / Industrial Designer<br>• Manufacturing / CNC Engineer<br>• **Design Engineer** – mechanical + creative problem solving |

**At The Elizabethan Academy we offer a curriculum that:**

- is broad, balanced, inspiring and inclusive
- builds confidence, independence and **resilience**
- encourages students to develop the **skills, knowledge and understanding** required to succeed academically
- encourages students to participate in a wide variety of activities which extend beyond the classroom
- places creativity and imagination at the heart of learning to develop enquiring minds
- enables students to understand the connections and links between different subjects
- raises students' aspirations through promoting academic excellence
- develops students' **social and cultural knowledge**, skills and understanding
- develops students' **respect for spiritual and moral values**, and tolerance towards other races, religions and ways of life.
- gives students the opportunities to put theoretical skills into practice and expand their knowledge beyond the exam specification
- prepares students for the world of work in a rapidly changing world.

**Extracurricular activities**  **Careers links**  **Curriculum links**  **Threshold topics (bold)**  **PSHE, PD and cultural capital links**

# Design & Technology: Key Stage 3 **Grade Descriptors Year 7**

| Y7 | Designing | D&T: Making | DT: Tech Knowledge | Evaluating | Food: Cooking and Nutrition |
|---|---|---|---|---|---|
| Emerging | I can do simple research with guidance.<br>I can explain basic details of a design problem.<br>I can list key requirements for my design.<br>I can produce a few design ideas with simple rendering.<br>I can label my designs.<br>I can explain the main steps to make my product with help. | I can make a simple product with teacher support.<br>I can demonstrate basic practical skills using a limited number of tools and processes, with support. | I can identify basic properties of materials and give a simple reason for my choices | I can identify some strengths and weaknesses in my product.<br>I can carry out basic tests on my product with some support. | I can identify basic healthy and unhealthy foods.<br>I can cook a simple dish using basic cooking techniques like chopping and boiling, with help.<br>I can identify where some ingredients come from. |
| Developing | I can research using a few sources with some independence.<br>I can describe the design problem and suggest possible solutions.<br>I can list specific design criteria for my product.<br>I can develop several design ideas with some creativity.<br>I can add notes to explain my designs.<br>I can list the main steps to make my product. | I can make a product that shows some attention to detail, with limited teacher support.<br>I can use a range of materials, tools, and processes with some independence and growing confidence | I can describe key properties of common materials and explain why they are suitable for my product. | I can describe what works well and what could be improved in my product.<br>I can test my product independently and describe how well it works. | I can explain why some foods are healthier than others.<br>I can follow a recipe and cook a few different dishes using techniques such as frying, baking, and grilling on my own.<br>I can identify where some ingredients come from and describe their characteristics. |
| Meeting | I can choose useful sources and explain how they improved m design ideas.<br>I can evaluate design problems and adapt solutions using feedback.<br>I can write clear, measurable design criteria with ACCESSFM.<br>I can create varied and creative, fully rendered design ideas.<br>I can use ACCESSFM to annotate my design ideas.<br>I can create a logical step-by-step plan with simple checks. | I can make a product that is accurate and precise, solving problems during the process.<br>I can use a wide range of tools, materials, and processes accurately and with some precision | I understand the properties of materials and components and can explain how my choices help my product to function well. | I can explain specific strengths and development areas in my product and suggest future improvements.<br>I use accurate testing methods to check if my product meets the design criteria. | I can apply basic nutrition principles to make balanced food choices.<br>I can independently cook a variety of dishes using a range of cooking techniques.<br>I can identify when ingredients are in season and explain their nutritional benefits |
| Exceeding | I can research from a range of sources and analyse my findings to guide my design choices.<br>I can analyse design problems and justify my decisions with evidence.<br>I can write detailed design criteria to ensure my designs are fit for purpose.<br>I can create unique ideas using strategies like biomimicry and user-focused design.<br>I can use ACCESSFM with subject-specific vocabulary to annotate and present my design ideas.<br>I can make an accurate plan for manufacture with quality control and explain my material choices. | I can make a high-quality product using a wide range of materials, tools, and processes.<br>I can confidently and independently use a broad range of tools, materials, and techniques to produce high-quality work. | I can confidently select materials and components based on a secure understanding of their properties and explain why they are the most suitable choice for my product.<br>**Electronics/systems:** I can effectively use advanced mechanical and electronic systems (such as gears, levers, sensors) to enable movement and control in my product design. | I can give a detailed evaluation of my product, explaining key strengths and weaknesses, and how specific improvements made during the process helped meet the design criteria.<br>I carry out detailed testing using both qualitative and quantitative methods. | I can explain nutrition principles and how to make balanced food choices for different people or purposes.<br>I can independently cook a variety of dishes using a range of cooking techniques **to a high standard**.<br>I can understand the source, seasonality, and use of a wide range of ingredients and what nutritional benefits they bring to a recipe. |

# Design & Technology: Key Stage 3 **Grade Descriptors Year 8&9**

| Y8-9 | Designing | D&T: Making | DT: Tech Knowledge | Evaluating | Food: Cooking and Nutrition |
|---|---|---|---|---|---|
| Emerging | • I can research using a few sources with some independence.<br>• I can describe the design problem and suggest possible solutions.<br>• I can list specific design criteria for my product.<br>• I can develop several design ideas with some creativity.<br>• I can add notes to explain my designs.<br>I can list the main steps to make my product. | • I can make a product that shows some attention to detail, with limited teacher support.<br>I can use a range of materials, tools, and processes with some independence and growing confidence | I can describe key properties of common materials and explain why they are suitable for my product. | • I can describe what works well and what could be improved in my product.<br>I can test my product independently and describe how well it works. | • I can explain why some foods are healthier than others.<br>• I can follow a recipe and cook a few different dishes using techniques such as frying, baking, and grilling on my own.<br>I can identify where some ingredients come from and describe their characteristics. |
| Developing | • I can choose useful sources and explain how they improved my design ideas.<br>• I can evaluate design problems and adapt solutions using feedback.<br>• I can write clear, measurable design criteria with ACCESSFM.<br>• I can create varied and creative, fully rendered design ideas.<br>• I can use ACCESSFM to annotate my design ideas.<br>I can create a logical step-by-step plan with simple checks. | • I can make a product that is accurate and precise, solving problems during the process.<br>I can use a wide range of tools, materials, and processes accurately and with some precision | I understand the properties of materials and components and can explain how my choices help my product to function well. | • I can explain specific strengths and development areas in my product and suggest future improvements.<br>I use accurate testing methods to check if my product meets the design criteria. | • I can apply basic nutrition principles to make balanced food choices.<br>• I can independently cook a variety of dishes using a range of cooking techniques.<br>I can identify when ingredients are in season and explain their nutritional benefits |
| Meeting | • I can research using a range of sources and analyse my findings to guide my design choices.<br>• I can analyse design problems and justify my decisions with evidence.<br>• I can write detailed design criteria to ensure my designs are fit for purpose.<br>• I can create unique ideas using strategies like biomimicry and user-focused design.<br>• I can use ACCESSFM with subject-specific vocabulary to annotate and present my design ideas.<br>I can make an accurate plan for manufacture with quality contro and explain my material choices. | • I can make a high-quality product using a wide range of materials, tools, and processes.<br>I can confidently and independently use a broad range of tools, materials, and techniques to produce high-quality work. | • I can confidently select materials and components based on a secure understanding of their properties and explain why they are the most suitable choice for my product.<br>**Electronics/systems:** I can effectively use advanced mechanical and electronic systems (such as gears, levers, sensors) to enable movement and control in my product design. | • I can give a detailed evaluation of my product, explaining key strengths and weaknesses, and how specific improvements made during the process helped meet the design criteria.<br>I carry out detailed testing using both qualitative and quantitative methods. | • I can explain nutrition principles and how to make balanced food choices for different people or purposes.<br>• I can independently cook a variety of dishes using a range of cooking techniques **to a high standard**.<br>I can understand the source, seasonality, and use of a wide range of ingredients and what nutritional benefits they bring to a recipe. |
| Exceeding | • I can research widely, using experts and investigations, to mak informed design decisions.<br>• I can rethink design problems and independently identify and develop effective solutions.<br>• I can write detailed design criteria that meet user needs and ensure the product is fit for purpose.<br>• I can create innovative, commercially viable ideas that meet design criteria and user needs.<br>• I can present my design ideas effectively through sketches, plans, and annotations using specialist terminology.<br>• I can create detailed manufacturing plans with materials, tools timings, safety, and quality checks for others to follow. | • I can create complex, commercially viable products (with only minor modifications) that meet the needs of users.<br>• I can accurately select and use specialist tools, techniques, and computer-aided manufacture to produce high-quality, professional outcomes. | • I can apply advanced knowledge of materials and components to make well-judged choices that ensure my product is functional, durable, and appealing.<br>**Electronics/systems:** I can integrate mechanical systems, electronics, and computer control to create an intelligent product that responds to inputs and controls outputs using programmable components. | • I critically reflect on both the strengths and limitations of my product, considering user needs, commercial potential, and the wider impact of my design.<br>I actively use feedback from intended users to refine and improve my product. I analyse existing products or other designers' work to inform my suggested improvements. | • I can adapt or create recipes to meet specific dietary needs or preferences.<br>• I can plan and prepare complex meals using a wide range of advanced cooking techniques.<br>I can confidently explain how nutrition, ingredients, and seasonality impact food choices for individuals and communities |

| Link to KS3 national curriculum | | Fd | Fd | DT | DT | Tex | Fd | Fd | DT | DT | Tex | Fd | Y9 Eg | Y9 Pd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F&N | Seasonal food | Choc | Bots | Mini. Monster | F&N | Special diets | Mood light | Moving toy | Bag | Food Science | Speaker | Memphis letter |
| | | C&N Tech | Design | Design | Make | Make | C&N Tech | Design | Make | Make | Design | C&N Tech | Make | Design |
| **National Curriculum - Design and technology key stages 3 and 4** | | Make | C&N Tech | Make | Evaluate | DT Tech | Make | C&N Tech | DT Tech | Evaluate | Make | Make | Evaluate | DT Tech |
| use research and exploration, such as the study of different cultures, to identify and understand user needs | Design | | Yes | Yes | | | | Yes | | | Yes | | Yes | |
| identify and solve their own design problems and understand how to reformulate problems given to them | Design | | Yes | Yes | | | | Yes | | | Yes | | | Yes |
| develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations | Design | | | Yes | | | | | | | Yes | | | Yes |
| use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses | Design | | | Yes | Yes | | | | | | Yes | | | Yes |
| develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools | Design | | Yes | Yes | Yes | | | Yes | | | Yes | | | Yes |
| select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture | Make | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties | Make | Yes | Yes | n/a | n/a | n/a | Yes | Yes | n/a | n/a | Yes | Yes | Yes | Yes |
| analyse the work of past and present professionals and others to develop and broaden their understanding | Evaluate | | | | Yes | Yes | | | Yes | | | | Yes | Yes |
| investigate new and emerging technologies | Evaluate | | | | Yes | | | | Yes | | | | Yes | |
| test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups | Evaluate | | | | | Yes | | | | Yes | | | Yes | |
| understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists | Evaluate | | | | Yes | | | | Yes | Yes | Yes | | | |
| understand and use the properties of materials and the performance of structural elements to achieve functioning solutions | DT Tech | | | Yes | Yes | Yes | | | Yes | Yes | Yes | | Yes | Yes |
| understand how more advanced mechanical systems used in their products enable changes in movement and force | DT Tech | | | | Yes | | | | | Yes | | | | |
| understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] | DT Tech | | | | | Yes | | | Yes | | | | | |
| apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]. | DT Tech | | | | | Yes | | | Yes | | | | | |
| understand and apply the principles of nutrition and health | C&N - Tech | Yes | Yes | | | | Yes | Yes | | | | Yes | | |
| cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet | C&N - Tech | Yes | Yes | | | | Yes | Yes | | | | Yes | | |
| become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes] | C&N - Tech | Yes | Yes | | | | Yes | Yes | | | | Yes | | |
| understand the source, seasonality and characteristics of a broad range of ingredients. | C&N - Tech | | Yes | | | | Yes | Yes | | | | Yes | | |

# Year 10 – Design Technology

| | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|
| Knowledge, Skills and Understanding – Theory | 1.1 - How critically evaluating new and emerging technologies informs design decisions, considering ethical, environmental, and future scenarios.<br>1.2 - How evaluating new technologies informs design decisions, considering ethical, environmental, and future perspectives.<br>1.3 - How energy is generated and stored to select suitable sources for products and power systems. | 1.4 - Developments in modern and smart materials, composite materials and technical textiles.<br>1.5 - Mechanisms: levers, cams, pulleys, cranks and sliders, gears.<br>1.6 - How electronic systems use sensors, controls and devices to provide functionality through various inputs and outputs. | 1.7 - Using programmable components to add and customise product functionality.<br>1.8 - Materials Properties: Metals – ferrous metals, non-ferrous metals and their properties.<br>1.9 – Materials Properties: Papers and Boards – paper, board and their properties. | 1.10 - Materials Properties: Polymers – thermoforming polymers, thermosetting polymers and their properties.<br>1.11 - Materials Properties: Textiles – natural fibres, synthetic fibres, woven textiles, non-woven textiles.<br>1.12 - Materials Properties: Timbers – natural timbers (hardwoods and softwoods), manufactured timbers. | 1.13 - All design and technological practice takes place within contexts which inform outcomes.<br>1.14 - Investigate environmental, social and economic challenges when identifying opportunities and constraints that influence the processes of designing and making.<br>1.15 - Investigate and analyse the work of past and present professionals and companies in order to inform design.<br>1.16 - Use different design strategies to generate initial ideas and avoid design fixation.<br>1.17 - Develop, communicate, record and justify design ideas, applying suitable techniques. | |
| Practical | **Timbers Project**<br>Creating a product to solve a design problem using softwood and manufactured boards. Developing practical skills in safe tool use, measuring, marking, cutting and joining timber. Producing an accurate, well-finished product and recording progress through simple testing and evaluation. | | **Metals Project**<br>Developing practical skills in marking out, cutting, shaping and joining metals. Students work with ferrous and non-ferrous metals, using the brazing hearth and precision hand tools to manufacture a product from an engineering drawing. | | **CAD and 3D Printing Project**<br>Designing a customised product, developing the model in CAD, and printing and refining the final design. CAD and 3D Printing | **NEA:** 1.1 (Research) Investigating user needs and contextual challenges. |
| ASSESSMENT | Theory assessed half-termly to check understanding. Each assessment is focused on the topic that has been taught in that half-term.<br>Practical work assessed. Work is being assessed against the mark scheme for the NEA making section. | | | | | Yr10 Mock. |
| **Embed your Learning** | Topics are uploaded to Seneca for students to complete after it is taught. | | | | | |
| Extend your knowledge | **Product Evaluation Task:** Choose a modern product (e.g., Dyson fan, smart speaker, or electric bike). Identify the technologies used and how they improve user experience.<br>**Timber Investigation:** Visit a DIY store (B&Q, Wickes) and photograph different timber types—label softwoods, hardwoods, and manufactured boards.<br>**Mechanism Hunt:** Find examples of levers, gears, cams, and pulleys around home or outdoors—take photos and explain how each mechanism changes force or movement.<br>**Smart Materials in Use:** Find three objects that use smart materials (e.g., thermochromic mugs, memory foam, self-darkening lenses). Write a short explanation of the technology. | | **Microcontroller Challenge:** Use an online simulator (TinkerCAD Circuits) to build a simple LED circuit or program a flashing sequence.<br>**Paper & Board Use:** Examine packaging from food or tech products - identify the material type and why it was chosen.<br>**Polymers Around You:** Identify a range of plastics at home and classify them as thermosetting or thermoplastic (use recycling codes to help).<br>**Textiles Exploration:** Look at clothing labels—identify fibre types (cotton, polyester, elastane) and compare their properties.<br>**Recycling Comparison:** Investigate how polymers, textiles, and wood are recycled differently. | | **Designer Research:** Choose one designer (e.g., James Dyson, Naoto Fukasawa, Raymond Loewy) and analyse how their work influences products today.<br>**User Interview Task:** Interview a family member about a design problem they have at home—record the need and sketch two ideas.<br>**Inspiration Board:** Create a mood board of design styles (minimalist, art deco, biomimicry).<br>**Survey Creation:** Make a short survey to collect user feedback that will help define a design brief. | |

# Year 11 – Design Technology

| | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | HT 6 |
|---|---|---|---|---|---|---|
| **Knowledge, Skills and Understanding**  | **Theory**<br>**7.1–7.3:** Design contexts; sources, properties, and environmental impact of natural and manufactured timbers; and factors influencing timber selection.<br><br>**NEA**<br>**Research (1.1):** Investigating user needs and contextual challenges.<br>**Design brief & specification (1.2):** Defining clear and justified design requirements.<br>**Initial ideas (2.1):** Generating and annotating creative, functional design proposals. | **7.4–7.8:** Forces and stresses in timbers, stock forms and sizes, manufacturing processes, shaping and assembly methods, and surface finishes.<br><br>**Annotating and refining initial ideas** (2.1–2.2).<br>**Developing design ideas** (2.3) through sketching, modelling, and feedback.<br>**Producing a final design proposal** (2.5) that meets the specification.<br>**Selecting appropriate materials** and components (3.1a) for function, quality, and aesthetics. | Begin **making (3.2)** — planning and producing the final prototype.<br>Maintain a detailed **Diary of Manufacture (3.1b)** to record processes, tools used, and quality checks.<br>Apply workshop skills, accuracy, and safe working practices.<br>Test and adapt components or techniques as the prototype develops. | • Continue **making (3.2)** — completing construction and assembly of the final prototype.<br>• Maintain and finalise the **Diary of Manufacture (3.1b)**, recording accuracy checks, quality control, and problem-solving.<br>• Carry out **testing and modifications** to ensure the product meets the specification. | **1.1–1.17:** Full revision of core content — including new and emerging technologies, energy generation, materials, systems, and design theory.<br><br>Undertake focused exam preparation through topic revision, practice papers, and exam-style questions.<br><br>Complete the **evaluation (4.1)** — testing and analysing the final prototype against the design specification | |
|  | NEA section 1.1 and 1.2 assessment | **Regular in class assessments to check understanding of theory topics being covered alongside**<br>Mock paper 1<br>NEA section 2.1 – 2.3 assessment | Mock paper 2 - just before half term<br>All sections 1.1 to 2.5 assessed | n/a students will need to focus on NEA work this half term | **NEA Final Deadline - Friday 24th April** | |
| **Embed your Learning**  | Revision Tasks will be set on Seneca for each topic area – students to complete knowledge organisers after each theory lesson | | Revision Tasks will be set on Seneca for each topic area – students to complete knowledge organisers after each theory lesson | | Exam preparation homework focusing on topic revision and completion of practice papers and exam-style questions. | |
| Extend your knowledge  | Compare natural and manufactured timbers — create a mini case study showing environmental pros and cons.<br>Investigate a designer or company known for sustainable timber use (e.g. furniture or architecture).<br>Create a short presentation on how deforestation and responsible sourcing affect design decisions. | Research how large-scale manufacturers use CNC machinery or automation in timber production.<br>Create a visual guide to different timber joints or finishes and explain which would be best for your NEA product.<br>Create a comparison chart of different material groups (metals, polymers, textiles, timbers, papers/boards) showing advantages and disadvantages. | Investigate a sustainable or innovative new material (e.g. bioplastics, mushroom leather) and present how it could impact design.<br>Experiment at home or using online simulators (e.g. Tinkercad Circuits) to design a basic electronic system.<br>Sketch or prototype a product that could use a programmable component to improve its performance. | Create a revision resource (quiz, infographic, or flashcards) covering one key area of the specification.<br>Write a short article or blog-style reflection: *"How sustainable design is shaping the future of technology."*<br>Analyse a past exam paper question and model a high-level response using keywords from the specification. | | |

# Year 12 – Design Technology

| | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|
| **Knowledge, Skills and Understanding**  | Materials and their applications<br>Testing materials<br>Performance characteristics – papers and boards, polymers, biodegradable polymers, Woods, metals | Design methods and processes<br>Design theory<br>Technology and cultural changes<br>Desing processes<br>Critical analysis and evaluation<br>Selecting appropriate tools, equipment and processes<br>Accuracy in design and manufacture | Responsible design<br>Design for manufacture<br>Enhancement of materials<br>Forming, redistributing and addition processes (3 weeks)<br>The use of finishes | Modern and industrial commercial practice<br>Digital design and manufacture<br>Product design and development<br>Health and safety<br>Design for manufacturing, maintenance, repair & disposal<br>Enterprise and marketing in the development of products | Design communication (TP)<br>Internal exams – AS external exams<br>Technology and cultural changes (A-level specific) (DMP)<br>Design processes – prototype development (A-level specific) (DMP)<br>Design processes (A-level specific) (DMP) – iterative design in commercial contexts | Design theory (A-level specific) (DMP)<br>Design theory (A-level specific) (DMP)<br>Selecting appropriate tools, equipment and processes (A-level specific) (DMP)<br>Responsible design (A-level specific) (DMP)<br>Design for manufacture and project management (A-level specific) (DMP) |
| | **NEA preparation (Jewellery project)** - pewter casting based on a design movement. Research into chosen movement, develop design ideas and sketches, create moulds, cast and finish pewter jewellery. Focus on materials properties, safe workshop practice, and design evaluation. | | **NEA preparation (Phone stand project)** - CAD/CAM and 3D printing, research into theme, manufacturing techniques – turning, brazing, milling, writing a design specification, design ideas, CAD modelling | | **AO1 Section A – Identifying and investigating design possibilities (20 marks)** - Rationale for chosen context clearly identified. Investigation including: disassembly, practical experimentation, visits, surveys and interviews, focus groups, primary and secondary research. Investigation material thoroughly analysed and initial concepts generated.<br>**AO1 Section B – Producing a design brief and specification (10 marks)** - Produce a clear and challenging design brief and fully detailed design specification reflecting thorough consideration of investigations undertaken. | |
|   | Baseline assessment – AS level paper 1 | End of term formal assessment based on theory content covered in HT1 and HT2 | Practical and skills assessment of pewter jewellery outcome and design portfolio | End of HT term formal assessment based on theory content covered in HT1-3 | Practical & skills assessment of balancing toy outcome and portfolio<br>NEA Tracker section A&B | EOY 12 - PPEs week 35-6 |
| **Embed your Learning**  | Please use this link to access all the knowledge organisers for the year 12 theory topics KORGS | | | | | |
| Extend your knowledge  | **Materials, Design Methods, and Responsible Design**<br>• Material Swap Challenge: Redesign a product using different materials. Justify choices for cost, performance, and sustainability.<br>• Visit a local recycling or manufacturing site and suggest how circular design could improve their products.<br>• Research how brands like Patagonia or IKEA use sustainable design principles.<br>• Carry out an Ethical Design Audit of a company's materials and processes; propose one improvement.<br>• Explore a design movement (e.g. Bauhaus, Memphis) and create a quick visual showing its influence on modern design. | | **Half Term 3 & 4 – Manufacturing, Processes, and Commercial Practice**<br>• Reverse Engineer a small product (e.g. lamp or speaker). Sketch construction and suggest one redesign.<br>• Watch *How It's Made* or *Inside the Factory* and note key differences from school manufacture.<br>• Create a short CAD Timeline showing how CAD/CAM has evolved and impacted design.<br>• Compare additive vs. subtractive manufacturing and list pros, cons, and uses. | | **Half Term 5 & 6 – Industry, Enterprise, and Advanced Design Practice**<br>• Watch a virtual factory tour (BMW, Dyson, Lego) and summarise how quality control and automation are used.<br>• Choose a **brand** and develop a redesigned product concept reflecting its values and sustainability goals.<br>• Enter a design competition (e.g. Dyson Award, Design Ventura, Young Engineer for Britain).<br>• Visit a design exhibition (e.g. New Designers, London Design Festival) and record key ideas in your sketchbook.<br>• Build a digital design portfolio to document your research and project progress. | |

# Year 13 – Design Technology

| | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | HT6 |
|---|---|---|---|---|---|---|
| **Knowledge, Skills and Understanding**  | National and international standards in product design<br>Materials and their applications<br>Classification of materials<br>Methods for investigating and testing materials<br>Performance characteristics of materials<br>Forming, redistribution and addition processes (A-level specific) (TP) | Forming, redistribution and addition processes (A-level specific)<br>The use of finishes (A-level specific)<br>Modern and industrial commercial practice (A-level specific)<br>Digital design and manufacture (A-level specific) | Digital design and manufacture (A-level specific)<br>The requirements for product design and development<br>Protecting designs and intellectual property<br>Design for manufacturing, maintenance, repair and disposal<br>Feasibility studies<br>Enterprise and marketing in the development of products | Modern manufacturing systems<br>Detailed product study<br>Detailed product comparison<br>Detailed product analysis<br>Exam preparation – Exam technique<br>Exam preparation | ‹am preparation and ›vision for paper 1 and aper 2 | |
| | **AO2 Section C – Development of design proposal(s) (25 marks)**<br>Generate design proposals that take full account of the design brief and specification.<br>Produce a comprehensive and fully detailed manufacturing specification. | | **A02 Section D – Development of design prototype(s) (25 marks)**<br>Manufacturing a prototype using all potential resources, tools machines and equipment to a high level. On-going development directly related to the design proposals. On-going testing and evaluation<br>**A03 Section E – Analysing and evaluating (20 marks)**<br>On-going analysis and evaluation that informs the manufacture of the prototype. Testing and fitness for the needs of the client/user. Critical analysis of the final prototype. Modifications and improvements including consideration of levels of production. | | | |
|  | NEA tracker section A- B | Y13 PPEs – full A level paper 1 & 2<br>NEA tracker section A- C | NEA section A, B, C, D marked & feedback given<br>Y13 PPEs – full A level paper 1 & 2 | Regular in class assessments to check understanding. | Internal moderation and submission of NEA marks to AQA | |
| **Embed your Learning**  | Please use this link to access all the knowledge organisers for the year 13 theory topics KORGS | | | | | |
| Extend your knowledge  | **Materials, Standards & Manufacturing Practice**<br>Create concise revision flashcards for material classifications, properties, and applications – include one *exam example* for each.<br>Research BSI and ISO standards and summarise how they appear in exam questions or past papers.<br>Write a short evaluation paragraph comparing two forming or finishing processes, using PEE (Point–Evidence–Explain).<br>Watch a factory tour video (e.g. Dyson or BMW) and identify three quality-control measures you could reference in an essay.<br>Practise a 6-mark question on materials testing or performance – focus on using precise technical vocabulary.<br>Summarise modern and industrial processes in a single-page “cheat sheet” for quick recall before exams. | | **Product Development, IP & Marketing**<br>Research a patented product and explain briefly how IP protects its innovation.<br>Complete a feasibility study for your NEA – focus on cost, manufacture, and sustainability.<br>Compare two design companies (e.g. Dyson vs Apple) to practice analysis and evaluation.<br>Create a lifecycle diagram of a product and note key points for improvement (AO3 practice). | **Analysis, Systems & Exam Technique**<br>• Complete at least two full practice papers under timed conditions; self-mark using the official mark scheme.<br>• Build a product comparison grid (materials, function, manufacture, cost) to strengthen applied analysis answers.<br>• Answer one 9-12 mark exam question each week – focus on structure, evidence, and evaluative depth.<br>• Produce a revision mind map connecting topics (materials, processes, standards, and design theory).<br>• Research modern manufacturing systems (e.g. lean, JIT, automation) and practise linking them to real-world examples in written responses.<br>• Use exam command words (analyse, evaluate, justify) to rewrite notes into question-answer form for active recall. | | |