

Design technology- Product design- Curriculum map

Key stage 2 (primary school) knowledge <i>No prior learning is assumed due to variation of teaching amongst primary schools.</i> • Understand how product design engineering is used in many aspects of society • Recognise the difference between a drawing and a design • Demonstrate safe practices when using equipment. • Demonstrate working in a safe manner • Recognise what techniques will be appropriate in order to produce a product based on their designs. • Demonstrate some practical outcomes		
Key skills/content requirements at GCSE- level 2		
• The impact of new and emerging technologies • Generation of energy • Modern and smart materials • Functions of mechanical devices and forces • Electronic systems • Programmable components	• Types of metals • Types of papers and boards • Types of plastics • Types of fabrics and fibres • Types of timbers and manufactured boards • Environmental issues • Past and present designers	• Develop and communicate design ideas • Manufacturing in timbers • Specialist timbers/ manufactured boards equipment • Surface finishes
Year 7		Year 8
Core aim 10-14-week rotation (aprox 10-14 hours) Rotating termly In Year 7 Product Design, students are introduced to the fundamental knowledge and skills that underpin the subject. They will learn about the origins, properties, and applications of timbers and manufactured boards, developing an understanding of how material selection influences product		Core aim 10-14-week rotation (aprox 10-14 hours) Rotating termly In Year 8 Product Design, students will build upon the knowledge, understanding, and practical skills developed during Year 7. The year begins with a personalised phone holder project, enabling students to consolidate their workshop skills and

performance and suitability for a given purpose. Students will be guided through the key stages of the design process, with a particular focus on the development of design ideas and the importance of ongoing evaluation. They will learn how designers use research, feedback, and reflection to refine and improve their work, ensuring that products effectively meet the needs of users. Throughout the rotation, students will safely develop a range of core practical skills, building confidence in the use of tools, equipment, and workshop processes. These skills will enable them to manufacture products based on their own design intentions while fostering independence, accuracy, and resilience. Many of the techniques taught have practical applications beyond the classroom and help to develop problem-solving and creative thinking skills. Students will complete two practical projects: a timber Cubot mini-make and a Memphis-inspired clock manufactured from timber and manufactured board. Alongside their practical work, students will investigate the work of influential designers and design companies, analysing how their products have been developed to meet user needs. This research will be used to inspire and inform students' own creative design ideas, supporting the development of imaginative and well-considered design solutions.

Practical skills

- Demonstrate how to select and use hand equipment
- Demonstrate basic cutting and joining techniques
- Demonstrate finishing techniques
- Developing design ideas and avoiding design fixation
- Develop communication skills
- Produce and analyse prototypes
- Demonstrate how to produce a production plan to guide their final outcome

further develop their confidence and independence when using tools, equipment, and manufacturing processes.

Students will then extend their understanding of mechanical systems by investigating movement through the study of cams and followers. Applying this knowledge, they will design and manufacture an automata using a combination of timber, manufactured boards, and polymers, gaining practical experience of how mechanical components can be used to create purposeful motion within a product.

Throughout the year, students will continue to develop their designing and making skills by working to a design brief and producing a detailed design specification. They will generate, develop, and communicate a range of design ideas, using feedback, testing, and ongoing evaluation to refine and improve their solutions. Emphasis will be placed on designing for a specified user, ensuring that products are both functional and aesthetically appealing.

As part of the manufacturing process, students will plan their practical work effectively and select appropriate materials, tools, and equipment, demonstrating safe and accurate working practices throughout. By the end of the year, students will have produced two high-quality products that showcase their growing technical knowledge, creativity, problem-solving skills, and ability to manufacture with increasing precision and independence.

Practical skills

- Analyse existing products to inform designing
- Develop design ideas and self-assess outcomes against the brief and specification.
- Demonstrate how to select and use hand equipment
- Demonstrate basic cutting and joining techniques
- Demonstrate finishing techniques

Core content for rotation	Portable knowledge	Key terms	Core content for rotation	Portable knowledge	Key terms
Health and safety Communication methods- free hand sketching, on one point perspective, two-point perspective, rendering. Analysing existing products Investigating and using the work of others to inform designing. Developing design ideas. Types and properties of timbers and manufactured boards- cutting, shaping, joining and finishing. Working with and joining, in manufactured boards.	Health and safety in the workshop and when using tools and equipment. Types and properties of different materials- timbers and manufactured boards Communication techniques.	Target market Specification Brief Product analysis Design development ACCESSFM Aesthetics Measurements Accuracy Assembly Modelling Testing Evaluation Sustainability 3 Dimensional (3d) Rendering Manufactured boards Timber	Health and safety. Designing and design development. Types of movements, Types of CAMS. Manufactured with timbers and manufactured boards- cutting, joining, assembly and finishing. Communication methods- free hand sketching, on one point perspective, two-point perspective, isometric projection, rendering. Understanding user needs Investigation strategies Evaluation and testing of outcomes.	Health and safety in the workshop and when using tools and equipment. Types and properties of different materials- timbers, manufactured boards. Communication techniques. Types of movements including CAMS/ followers.	Automata Cams Followers Oscillating Linear Reciprocal Rotary Joint Butt Joint Measurements Accuracy Assembly Modelling Testing Evaluation Sustainability Culture
Year 9					
Core aim 10-14-week rotation (aprox 10-14 hours)					

Rotating termly

In Year 9 Product Design, students will build upon the knowledge, understanding, and practical skills developed throughout Key Stage 3, while developing a greater appreciation of the iterative design process. They will enhance their investigative, design, communication, and modelling skills by working to a design brief and specification, enabling them to create considered and purposeful design solutions.

Students will explore the work of the influential product designer Philippe Starck, analysing his design philosophy, products, and use of form and function. This research will be used to inspire and inform their own creative design ideas, while also developing their ability to communicate design thinking through a range of graphical and written techniques.

Throughout the project, students will generate, develop, and refine a range of design proposals, using feedback, testing, and ongoing evaluation to improve their outcomes. Emphasis will be placed on designing for a specific user, ensuring that products are functional, aesthetically pleasing, and meet identified needs.

Students will demonstrate their practical and manufacturing skills through the design and production of a mini product holder using timber, manufactured boards, or polymers. They will independently select appropriate materials, tools, and equipment, applying safe and accurate working practices throughout the manufacturing process. The completed product will be evaluated by the intended user, providing valuable feedback to inform students' reflections on the success of their design.

This project encourages students to work with increasing independence, fostering creativity, problem-solving, critical thinking, and resilience while preparing them for further study in Design and Technology at Key Stage 4

Practical skills.

- Demonstrate how to select and use hand equipment
- Demonstrate measuring, marking out and cutting materials
- Developing design ideas and avoiding design fixation
- Develop communication skills including CAD
- Produce prototypes/ models

Core knowledge	Portable knowledge	Key terms
• Investigation of existing designers to influence design thinking • Timber materials • 6R's of sustainability • Ergonomics and anthropometrics • Developing and analysing prototypes	• Working to a design brief and specification • Use of ACCESSFM when analysing products • Developing design ideas for a specified end user • Communication techniques- 1PP, 2PP, isometric and orthographic projection	Target market/ end user/client Specification Brief Product analysis Design development ACCESSFM

			• Health and safety in the workshop • Developing models/ prototypes. • Analysis and evaluation	Aesthetics Measurements Accuracy Assembly Modelling/ prototyping Testing Evaluation Sustainability 3 Dimensional (3d) One point perspective/ two point perspective/ isometric/ orthographic projection	
	Term 1	Term 2	Term 3	Portable knowledge	Key terms
Year 10	Autumn 1 Practical focus- Tooling up Communication methods Health and safety Designing strategies Material management Basic hand skills- cutting, joining, measuring, accuracy in timbers/ manufactured boards Knowledge focus Stock forms and standard components	Spring 1 Practical focus- Portable chair Primary and secondary investigation Communication techniques Design strategies/ Designers Prototyping and modelling Timbers- wastage, additions, forming and deforming Knowledge focus New and emerging technologies- industry, production techniques ad informing of designing. Textiles theory- sources. Properties and uses.	Summer 1 Practical focus- Mini contextual challenge- Encouraging wildlife Communication techniques Developing design ideas Independent practise Development of design ideas Working to a contextual challenge. Knowledge focus Development in new materials, smart, modern, technical and composite.	Types and properties of different materials- timbers, manufactured boards, metals/alloys, paper/ boards and polymers Communication and rendering techniques including use of CAD Development and use of brief and specifications Working towards a brief and specification taking into	Joint Butt Joint Measurements Accuracy Fitting Assembly Modelling Prototypes Testing Evaluation Sustainability Inputs Processes Outputs Circuits LEDS Resistor Target market Specification Brief

	Timbers/ manufactured boards theory- sources, properties and uses. Autumn 2- Practical focus -Passive amp Communication techniques Selection of materials Working with timbers Working to tolerances Surface treatment and finishes Knowledge focus Paper and boards theory- sources properties and uses Energy generation and storage. Ecological and social footprint	Ergonomics and anthropometrics Scales of production New and emerging technologies Spring 2- Practical focus- Desk lamp Electronics Working with timbers	Metal alloys and polymers theory- sources, properties and uses Summer 2 Practical focus N/A Knowledge focus NEA- Contextual challenge Identifying & investigating design possibilities Mechanical devices- types of movement, rotary systems, linkages and levers. Papers and boards Forces and stresses	consideration needs of a specific client Safe and accurate use of a range of tools and equipment Evaluation and testing of outcomes against a brief and specification. Use of past and present designers/ companies for inspiration	Product analysis Design development ACCESSFM Aesthetics Manufactured boards Timber Polymers Alloys Ferrous Non ferrous
Year 11	Contextual challenge: Investigate and design Producing a design brief & Specification Generating design ideas	Contextual challenge: Make Realising design ideas Analysing & evaluating	Revision and preparation for examination Revision and preparation for examination	Understanding of properties and characteristics of a range of materials including application: Polymers Metals	Investigation Analysis Design development Prototype Evaluation Critical thinking Problem solving

	Developing design ideas NEA will be completed within double lesson and single lesson used for retrieval and revision of core subject knowledge.	NEA will be completed within double lesson and single lesson used for retrieval and revision of core subject knowledge.		Timbers Paper and card Gears and levers Energy and the responsibility of the designer Construction techniques A range of factors to consider in industry: ethical, environmental, cultural, social.	Manufacture Production Specification Brief Critical analysis Ergonomics Anthropometric Data Survey Interview Reflection Market research End user Design fixation Initial design Innovate Product analysis Designer Engineer
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GCSE external assessment:

Design technology -Product Design AQA uses the GCSE 1-9 grading system, where 9 is the best grade. All examinations are terminal (at the end of Year 11). The assessments are comprised of the following components:

- Paper 1: 50%
- NEA: Contextual challenge 50%

SMSC in product design

The study of product design includes many topics and activities that support the spiritual, moral, social and cultural development of students. The product design curriculum offers opportunities to consider a range of topics such as development and globalisation, managing environments, disasters, urban change and the choice between the productions of food or biomass energy. Within each topic, students are encouraged to reflect on how people affect places and how places affect people. Students are encouraged to consider what could or should be done and who benefits and suffers from changes whilst undertaking a variety of individual, pair and group work tasks.

Spiritual development in product design

Students have many opportunities to reflect on their beliefs and life perspectives whilst learning about production in other parts of the world. They are encouraged to consider the feelings and values of others whilst debating topics such as fair trade and to show respect for others whilst taking part in role-plays about issues such as quarrying. Students are given opportunities to use their imagination and creativity through extended tasks and regularly reflect on their experiences both verbally and in writing. The accuracy and reliability of methods and the accuracy of data is considered and thinking skills are developed through tasks such as giving Aid and types of Aid. The study of product design supports students in their quest to find out more about themselves, others and the world around them.

Moral development in product design

Whilst studying product design, students are encouraged to share and justify their views about moral and ethical issues such as when studying material sourcing, extraction and poverty in less developed countries. During lessons students are given opportunities to listen and appreciate the ideas of others and to consider the implications of decision making. Decision making exercises about issues such as open cast quarrying support moral development through product design as students consider right and wrong, respect for laws and the consequences of decisions and behaviour.

Social development in product design

In product design, students work with others from different backgrounds, and this is encouraged, through the use of a seating plan and a variety of team work and group tasks. Research opportunities require students to cooperate and show mutual respect whilst working in groups carrying out a range of tasks. Leadership qualities, speaking and listening skills, organisational ability and conflict resolution are developed whilst in the field but also whilst undertaking activities such as research and presentation group tasks. Self and peer assessment take place regularly in product design and encourages students to reflect on their progress.

Cultural development in product design

Many topics in product design allow students to develop their understanding of cultures and heritage at local, regional, national and international production. Through learning about case studies, design movements and influential companies it is important when considering topics such as extraction of raw materials and developing through investment.