



CURRICULUM CORE KNOWLEDGE PLAN

SUBJECT: Design Technology

YEAR GROUP: 10

DATE: 2024/2025

Students will work creatively when designing and making and apply technical and practical expertise, in order to: develop an appreciation of the importance of creativity and innovation to good design practice, actively engage in the processes of design and technology to develop as effective and independent learners, understand the key principles of designing and making, use their knowledge, skills and understanding to make design decisions in order to make a quality prototype, analyse existing products and produce practical solutions to meet needs, wants and opportunities, recognising their impact on quality of life, critically analyse links between the principles of good design, existing solutions and technological knowledge and understand the underlying technical principles within design and technology within their chosen area.

AO1 Identify, investigate, analyse and outline design possibilities to address needs and wants

AO2 Design and make prototypes and evaluate their fitness for purpose

AO3 Analyse and evaluate: design decision and outcomes in relation to products , wider issues in design and technology

AO4 Demonstrate and apply knowledge and understanding of design and technology principles

Term and unit	Core knowledge	Core skills	Revisiting prior knowledge	Links to Walney Ways & Employability skills/Careers
Autumn Term Technical Principles	Design and technology and our world. Pupils will learn about: 2.1 The impact of new and emerging	Pupils will have an understanding of:	Implemented in year 8 sustainable speaker project.	Walney Ways Aspirational Resilient Curious



Sketch up design-architectural project.	technologies on: • industry • enterprise • sustainability • people • culture • society • the environment • production techniques • systems 2.2. How the critical evaluation of new and emerging technologies informs design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment 2.3. How energy is generated and stored. And which sources are appropriate to make products.	How the impact of new and emerging technologies can affect the design of new products. Consider factors such as market pull and technology push. Pupils will be able to explain how a products life cycle can be altered after considering environmental concerns-6rs and sustainability. Consider how the needs of different cultures can impact upon a design. Be able to answer examination questions related to the above. Pupils will understand the advantages and disadvantages of using computer aided design (CAD), and computer aided manufacture (CAM). Will be able to identify where CAD/CAM applications can be utilised to improve the processes and quality within their own work. Pupils will understand the uses of renewable and non-renewable		Self motivated Wder thining Self aware Communicative. Employability skills Communication Customer/client service and commercial business awareness Organisation, planning and time management Problem solving
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		energy sources and the environmental impacts associated with them		
Autumn Term 2 Speaker project-electronic systems	2.4 Smart materials, composites and technical textiles Pupils will learn about: Developments in modern and smart materials, composite materials and technical textiles 2.5. Electronic systems and programmable components How electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs. 2.6. Programmable components The use of programmable components to embed functionality into products in order to enhance and customise their operation 2.7. The function of mechanical devices How mechanical devices can produce different sorts of movement to change the direction of forces.	Pupils will be able to identify and suggest uses for a variety of smart materials, including SMA, Polymorph and smart fibres and fabrics that respond to the environment such as photo and thermochromic. Pupils will be able to recognise circuit symbols and diagrams. They will understand the 'systems' approach-input; process; output. Pupils will be able to describe different output devices and their uses in everyday products, and recognise the difference between analogue and digital programmes. Pupils will be able to suggest the uses for these systems within a variety of everyday products. Pupils will be able to analyse everyday mechanical devices and how they function. Including the use of pulleys, gears, levers and cams.	Implemented in KS3 mechanisms and levers.	Walney Ways Aspirational Resilient Curious Self motivated Wider thinking Self aware Communicative. Employability skills Communication Customer/client service and commercial business awareness Organisation, planning and time management Problem solving



Spring Term 1 Model making with papers and boards.	2.8. Materials Pupils will have a broad understanding of the categorisation and properties of a range of materials. They should be aware of their source, use and application in products. The materials to be covered are: 2.8. Papers and boards 2.9. Natural and manufactured timber 2.10. Ferrous and non-ferrous metals 2.11. Thermoforming and thermosetting polymers 2.12. Natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles	Pupils will be able to categorise and identify the properties of each material type, They will be able to explain how each is sourced and manufactured and how this impacts upon the environment. Pupils will identify the different categories of each and describe the stock forms that the materials are available in. Pupils are able to describe which materials will require a protective finish or treatment, and give examples of their applications in everyday life.	Implemented in year 9 model making and mechanism projects. Implemented in year 7 boat project and year 9 jewellery box and wooden frame project. Implemented in year 8 pencil holder project. Implemented in KS3 textiles projects.	Walney Ways Aspirational Resilient Curious Self motivated Wder thining Self aware Communicative. Employability skills Communication Customer/client service and commercial business awareness Organisation, planning and time management Problem solving Team working
Spring Term 2 Phone holders	3. In depth knowledge and understanding. Learners are required to develop an in-depth knowledge and understanding in relation to: 3.1 Natural and manufactured timbers. And 3.2 Thermoforming and Thermosetting polymers The sources, origins and physical properties. Material selection based on economic and environmental factors. Stock forms, types and sizes. Alternative	Pupils will be able to explain the physical and working properties of the materials in relation to toughness, flexibility, strength, absorbency, colour and hardness. Pupils will be able to answer questions relating to the environmental impact and sustainability of each material.	Implemented in year 7 boat project and year 9 jewellery box and wooden frame project. Implemented in year 8 pencil holder project.	Walney Ways Aspirational Resilient Curious Self motivated Wder thining Self aware Communicative.



	processes to manufacture in different scales of production. Specialist techniques and processes that can be used to shape, fabricate, construct and assemble a high quality prototype. A variety of surface treatments for both aesthetic and functional reasons. Thermoforming and Thermosetting polymers	Including the cultural and social implications of manufacture, in particular in third world countries. They can identify the behaviour of the materials when they are subjected to stresses and how they can be reinforced. Pupils will be able to explain and identify the advantages and disadvantages of a range of manufacturing techniques, Pupils will be able to answer a range of exam questions relating to their particular in depth material knowledge.		Employability skills Communication Customer/client service and commercial business awareness Organisation, planning and time management Problem solving
Summer Term 1 Mini NEA aeroplane design project.	4. Designing and making principles Pupils are required to develop their knowledge, understanding and skills needed as part of the sustained design and make assignment. 4.1. Understand that all design takes place within a context. 4.2. Identify and understand client and user needs through the collection of data. 4.3. Explore and develop ideas. 4.4. Investigate the work of past and present designers. 4.5. Use of different design strategies such as user centred, and iterative design.	Pupils are able to take a brief as a starting point and identify that possible outcomes and situations. Pupils will be able to perform a range of primary and secondary research which are related to a given context. They will consider the needs of a client by questioning and presenting their findings. Pupils will be able to analyse an existing product or situation to highlight if there is a specific need.	Implemented in all Ks3 lessons during the design process.	Walney Ways Aspirational Resilient Curious Self motivated Wder thining Self aware Communicative. Employability skills Communication



		Pupils will be able to use this information to prepare a design brief and specification that clearly meets a set criteria. Pupils will be able to answer questions on the work of Airbus, Apple, James Dyson, Philippe Starck and Matthew Williamson. Pupils will be able to follow a design process that includes contexts, requirements, solutions, evaluation and iterations.		Customer/client service and commercial business awareness Organisation, planning and time management Problem solving
Summer Term 2	NEA Contextual challenge AO1 Identifying and investigating design possibilities 1. Understand that all design and technological practice takes place within contexts which inform outcomes. 2. Identify and understand client and user needs through the collection of primary and secondary data. 3. Demonstrate an ability to write a design brief and specifications from their own and others' considerations of human needs, wants and interests.	Pupils will be able to analyse 3 contextual challenges by highlighting the key requirements of each. Pupils will demonstrate their ability to gather primary and secondary research. Pupils will be able to summarise this research and use it to formulate a suitable design brief and specification for a given design context.		Walney Ways Aspirational Resilient Curious Self motivated Wder thining Self aware Communicative. Employability skills Communication Customer/client service and commercial business awareness



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