

Design Technology Curriculum Map

Year 7						
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Theory Learning	To introduce shape and form using pencil sketching and the use of realistic drawing in Technology. To understand the difference between hardwoods and softwoods. To introduce the students to design briefs and why they are used for a customer centred approach to design. To understand the different methods of producing initial ideas. To introduce the use of modelling in technology using CAD/CAM. To understand the importance of health and safety in the workshop.	To understand the different types of finishes that can be used on hardwoods including stains. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand the basic principles of graphic design and the key elements that it involves. To develop further their understanding of design briefs to solve specific problems using 3D sketches, colour and annotation.	To understand the basic principles of packaging and the role of computer modelling and testing. To understand the use of CAD/CAM plotter for developing prototypes. To understand the use nets and other 3d techniques such as folding, scoring and perforating. To understand the role of Techsoft and other CAD programs in producing high quality prototypes.	To introduce shape and form using pencil sketching and the use of realistic drawing in Technology. To understand the difference between hardwoods and softwoods. To introduce the students to design briefs and why they are used for a customer centred approach to design. To understand the different methods of producing initial ideas. To introduce the use of modelling in technology using CAD/CAM. To understand the importance of health and safety in the workshop.	To understand the different types of finishes that can be used on hardwoods including stains. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand the basic principles of graphic design and the key elements that it involves. To develop further their understanding of design briefs to solve specific problems using 3D sketches, colour and annotation.	To understand the basic principles of packaging and the role of computer modelling and testing. To understand the use of CAD/CAM plotter for developing prototypes. To understand the use nets and other 3d techniques such as folding, scoring and perforating. To understand the role of Tec soft and other CAD programs in producing high quality prototypes.
Practical learning	To demonstrate the correct methods of marking and measuring materials using rulers, tri squares and the ability to indicate waste. To demonstrate the use of cutting tools and techniques including sawing and drilling.	To demonstrate the use of the vacuum former and CAD router machine to form an outer shell and inscribe a pattern onto their piece of man made board. To apply their design to their final puzzle product.	To demonstrate the correct working methods for paper and card products. To use correct procedures for accurately scoring and folding paper and card products. To demonstrate the correct joining techniques when working with paper and card products.	To demonstrate the correct methods of marking and measuring materials using rulers, tri squares and the ability to indicate waste. To demonstrate the use of cutting tools and techniques including sawing and drilling.	To demonstrate the use of the vacuum former and CAD router machine to form an outer shell and inscribe a pattern onto their piece of man made board. To apply their design to their final puzzle product.	To demonstrate the correct working methods for paper and card products. To use correct procedures for accurately scoring and folding paper and card products. To demonstrate the correct joining techniques when working with paper and card products.
Concepts	The design process. Material properties. Drawing and CAD. Basic Health and Safety.	Basic manufacturing techniques. Functionality and aesthetics	Converting 2d plans to 3d shapes. Environmental issues associated with packaging production and disposal	The design process. Material properties. Drawing and CAD. Basic Health and Safety.	Basic manufacturing techniques. Functionality and aesthetics	Converting 2d plans to 3d shapes. Environmental issues associated with packaging production and disposal
What is needed to master the knowledge	Explaining the difference between hardwoods and softwoods. Be able to evaluate material properties when selecting woods for different applications. Be able to consider the aesthetic applications of different wood types. To explain the role of CAD/CAM in modern production processes.	To be aware of the importance of modelling when developing products. To understand the role of graphics in brand identity. Recognise the use of papers and boards when designing packaging.	Understand the process of converting nets accurately from a 2d to a 3d state. Understand the importance of accurate dimensioning. Be able to explain how to use industry standard procedures such as differentiated lines for cutting, scoring and gluing	Explaining the difference between hardwoods and softwoods. Be able to evaluate material properties when selecting woods for different applications. Be able to consider the aesthetic applications of different wood types. To explain the role of CAD/CAM in modern production processes.	To be aware of the importance of modelling when developing products. To understand the role of graphics in brand identity. Recognise the use of papers and boards when designing packaging.	Understand the process of converting nets accurately from a 2d to a 3d state. Understand the importance of accurate dimensioning. Be able to explain how to use industry standard procedures such as differentiated lines for cutting, scoring and gluing
Common Misconceptions	The literal definition of hard and soft in relation to wood types. The common sources of paper and softwoods. That the design process is a systematic way of designing rather than inspirational.	The four key elements of the graphic design. The evaluation of designs based on simplicity and elegance over complexity. Application of design principles to solve specific problems. The drawing of 3D shapes.	Thinking Design is Just About Drawing. Misunderstanding Scale and Proportion. Ignoring the Importance of Annotations. Overemphasis on Aesthetics Over Functionality	The literal definition of hard and soft in relation to wood types. The common sources of paper and softwoods. That the design process is a systematic way of designing rather than inspirational.	The four key elements of the graphic design. The evaluation of designs based on simplicity and elegance over complexity. Application of design principles to solve specific problems. The drawing of 3D shapes.	Thinking Design is Just About Drawing. Misunderstanding Scale and Proportion. Ignoring the Importance of Annotations. Overemphasis on Aesthetics Over Functionality

Year 8						
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Theory Learning	To understand the basic principles of design technology. To understand how to shape and form using shading techniques. To understand the difference between ferrous and non-ferrous metal. To explore the environmental impact of metals and their use. To understand the difference between natural and synthetic textiles and the production methods used in the textile industry. To develop a deeper understanding of the design process using sketches and annotations to present initial ideas. To understand the use of CAD/CAM in the modelling process for a pewter medal	To understand the different types of finishes that can be used on metals. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand what mechanisms are and how they are used. To identify the different types of mechanisms.	To understand the different types of cams, profiles and followers including heart shaped, eccentric, snail and swash. To understand the use of the cadcam plotter for prototypes. To develop further their understanding of evaluation in relation to a practical product and the design process in its entirety	To understand the basic principles of design technology. To understand how to shape and form using shading techniques. To understand the difference between ferrous and non-ferrous metal. To explore the environmental impact of metals and their use. To understand the difference between natural and synthetic textiles and the production methods used in the textile industry. To develop a deeper understanding of the design process using sketches and annotations to present initial ideas. To understand the use of CAD/CAM in the modelling process for a pewter medal	To understand the different types of finishes that can be used on metals. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand what mechanisms are and how they are used. To identify the different types of mechanisms.	To understand the different types of cams, profiles and followers including heart shaped, eccentric, snail and swash. To understand the use of the cadcam plotter for prototypes. To develop further their understanding of evaluation in relation to a practical product and the design process in its entirety
Practical learning	To demonstrate the different methods of marking and measuring different types of textile materials. To demonstrate the use of needles and thread in the making of a pewter medal. To demonstrate methods of cutting and shaping using tools such as saws, drills and files.	To demonstrate the use of the pewter casting hearth and CAD router to mould and cast a letter from pewter. To demonstrate different methods that can be used to clean and finish the pewter materials. To demonstrate the use of polyurethane finish to seal the metal. To demonstrate quality control methods.	To demonstrate understanding of cams and materials suitable for their construction. To demonstrate understanding of other mechanisms such as cams linkages, ratchets and cranks. To demonstrate the practical skills needed to complete different mechanisms. Drilling, shaping, joining and finishing.	To demonstrate the different methods of marking and measuring different types of textile materials. To demonstrate the use of needles and thread in the making of a pewter medal. To demonstrate methods of cutting and shaping using tools such as saws, drills and files.	To demonstrate the use of the pewter casting hearth and CAD router to mould and cast a letter from pewter. To demonstrate different methods that can be used to clean and finish the pewter materials. To demonstrate the use of polyurethane finish to seal the metal. To demonstrate quality control methods.	To demonstrate understanding of cams and materials suitable for their construction. To demonstrate understanding of other mechanisms such as cams linkages, ratchets and cranks. To demonstrate the practical skills needed to complete different mechanisms. Drilling, shaping, joining and finishing.
Concepts	The design process, material properties specifically metals, alloys and textiles. Sustainability including extraction and recycling. Typography and aesthetics. Drawing and CAD. developing prototyping.	Mechanisms and movement. Modelling and broader manufacturing techniques. Evaluation and testing.	The change of movement from one type to another. Manipulation of movement for specific outcomes	The design process, material properties specifically metals, alloys and textiles. Sustainability including extraction and recycling. Typography and aesthetics. Drawing and CAD. developing prototyping.	Mechanisms and movement. Modelling and broader manufacturing techniques. Evaluation and testing.	The change of movement from one type to another. Manipulation of movement for specific outcomes
What is needed to master the knowledge	Explaining using examples the difference between ferrous and non-ferrous and alloy metals. To describe the process of material extraction and processing. To state reasons behind combining metals to form alloys. To describe the different types of natural and man made sources of textiles. To be able to implement basic textile processes.	Being able to understand how different finishes protect a product. Choosing finishes that are aesthetically pleasing as well as durable. Be able to demonstrate practical ways to manipulate materials. Be able to apply basic quality control measures to their work	Demonstrate and apply understanding of cams and linkages. Choose the appropriate mechanism for the desired outcome. Be able to explain the role of modelling in developing practical work	Explaining using examples the difference between ferrous and non-ferrous and alloy metals. To describe the process of material extraction and processing. To state reasons behind combining metals to form alloys. To describe the different types of natural and man made sources of textiles. To be able to implement basic textile processes.	Being able to understand how different finishes protect a product. Choosing finishes that are aesthetically pleasing as well as durable. Be able to demonstrate practical ways to manipulate materials. Be able to apply basic quality control measures to their work	Demonstrate and apply understanding of cams and linkages. Choose the appropriate mechanism for the desired outcome. Be able to explain the role of modelling in developing practical work

Common Misconceptions	All metals rust, confusion between rust and oxidation. The uses of alloy materials. Understanding of the methods used to control and change motion. How metals can be combined.	Misunderstanding the role of a finish in protecting materials. Not understanding the terminology of aesthetics. Lack of understanding of metal processing sequences. Confusing polishing, rubbing and finishing	That all mechanisms are similar. Confusion between fixed and standard pivots. The role of arcs angles in successful mechanisms	All metals rust, confusion between rust and oxidation. The uses of alloy materials. Understanding of the methods used to control and change motion. How metals can be combined.	Misunderstanding the role of a finish in protecting materials. Not understanding the terminology of aesthetics. Lack of understanding of metal processing sequences. Confusing polishing, rubbing and finishing	That all mechanisms are similar. Confusion between fixed and standard pivots. The role of arcs angles in successful mechanisms
Year 9						
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Theory Learning	To understand the use of shape and form using shading and rendering. To understand the difference between thermoplastic and thermoset plastics. To understand the design brief and the importance of the customer in the design process. To develop further their understanding of modelling within the design process. To review health and safety issues within the workshop. To develop further their understanding and application of marking and measuring in the design process using a variety of tools.	To understand the different types of finishes that can be used on metals. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand the basic principles of electrical and electronic systems including; simple circuits and components, organising and representing electrical systems, sensing circuits and feedback loops and programmable components.	To understand how CAD/CAM can be used to produce the glowing display project. Understanding simple circuits. Organising and representing electrical systems. How to plan, manufacture and populate their own electrical circuits virtually. How to incorporate the use of sensing components to produce outputs such as sound and light. Use the CAD/CAM to produce specific design outcomes and realise their 2D concepts.	To understand the use of shape and form using shading and rendering. To understand the difference between thermoplastic and thermoset plastics. To understand the design brief and the importance of the customer in the design process. To develop further their understanding of modelling within the design process. To review health and safety issues within the workshop. To develop further their understanding and application of marking and measuring in the design process using a variety of tools.	To understand the different types of finishes that can be used on metals. To understand the idea of quality control in the making process. To understand the evaluation process and design review including improvements that could be made. To understand the basic principles of electrical and electronic systems including; simple circuits and components, organising and representing electrical systems, sensing circuits and feedback loops and programmable components.	To understand how CAD/CAM can be used to produce the glowing display project. Understanding simple circuits. Organising and representing electrical systems. How to plan, manufacture and populate their own electrical circuits virtually. How to incorporate the use of sensing components to produce outputs such as sound and light. Use the CAD/CAM to produce specific design outcomes and realise their 2D concepts.
Practical learning	To demonstrate the correct methods of marking and measuring materials using rulers, triangles and the ability to indicate waste. To demonstrate the use of cutting tools and techniques including sawing and drilling.	To demonstrate the use of the acrylic line bender and the CAD router machine to produce an acrylic net and tessellated pattern to bend and shape a 3D object. To demonstrate the use of a variety of methods to finalise the end product. To display quality control measures.	To produce a plan, manufacture and populate an electrical circuit to incorporate the use of sensing components to produce outputs such as sound and light.	To demonstrate the correct methods of marking and measuring materials using rulers, triangles and the ability to indicate waste. To demonstrate the use of cutting tools and techniques including sawing and drilling.	To demonstrate the use of the acrylic line bender and the CAD router machine to produce an acrylic net and tessellated pattern to bend and shape a 3D object. To demonstrate the use of a variety of methods to finalise the end product. To display quality control measures.	To produce a plan, manufacture and populate an electrical circuit to incorporate the use of sensing components to produce outputs such as sound and light.
Concepts	The Design Process / Material properties specifically Thermoplastics Drawing and CAD / Developing Prototyping and Virtual modelling / Advanced Manufacturing Techniques/Health and Safety in different situations	Electronic components / Aesthetics and form / Critical Evaluation and Testing.	Electronic components / Time management and planning / Critical Evaluation and Testing. Health and safety in the workshop. Correct use of tools and machines to manipulate outcomes	The Design Process / Material properties specifically Thermoplastics Drawing and CAD / Developing Prototyping and Virtual modelling / Advanced Manufacturing Techniques/Health and Safety in different situations	Electronic components / Aesthetics and form / Critical Evaluation and Testing.	Electronic components / Time management and planning / Critical Evaluation and Testing. Health and safety in the workshop. Correct use of tools and machines to manipulate outcomes
What is needed to master the knowledge	To be able to describe the process of polymerisation and its associated products. To be able to describe the advantages and disadvantages of polymers in the production process along with the environmental impact of their use.	To undertake a detailed evaluation of end products using the design brief as justification of choices and recommendations. To recognise and produce a basic circuit. To describe the function of the circuit and how it can be modified for specific purposes.	To recognise which specific electronic components can be used to realise their objective. To use the CAD/CAM appropriately to produce their design idea. To use basic quality control techniques to evaluate their ideas. To be able to suggest improvements to their designs.	To be able to describe the process of polymerisation and its associated products. To be able to describe the advantages and disadvantages of polymers in the production process along with the environmental impact of their use.	To undertake a detailed evaluation of end products using the design brief as justification of choices and recommendations. To recognise and produce a basic circuit. To describe the function of the circuit and how it can be modified for specific purposes.	To recognise which specific electronic components can be used to realise their objective. To use the CAD/CAM appropriately to produce their design idea. To use basic quality control techniques to evaluate their ideas. To be able to suggest improvements to their designs.
Common Misconceptions	Types of plastics. The definition of the term polymer. Sources of plastics. Environmental impact of using plastics. Use of modelling in real life applications.	Circuits are populated with components. Circuits are variable and customisable. Circuits are more complex and flexible than realised. The role of aesthetics in design	That evaluations are purely negative. Lack of planning and time management in practical work. Incorrect use and application of tools. Testing is an ongoing process during making.	Types of plastics. The definition of the term polymer. Sources of plastics. Environmental impact of using plastics. Use of modelling in real life applications.	Circuits are populated with components. Circuits are variable and customisable. Circuits are more complex and flexible than realised. The role of aesthetics in design	That evaluations are purely negative. Lack of planning and time management in practical work. Incorrect use and application of tools. Testing is an ongoing process during making.

September 2021- July 2022	Yr10						Yr11					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Learning	Robotics, automation and production in industry Production techniques and systems – automation Enterprise Market pull and technology push Sustainability and the environment Critical evaluation of new and emerging technologies – planned obsolescence Design for maintenance Ethics The environment	Renewable and non-renewable resources Modern materials Smart materials Composite materials Technical Textiles Material properties Functionality Aesthetics Environmental factors Availability Cost Social factors Ethical factors	Designing: • sketching • modelling • testing Ecological issues in design and manufacture Properties of materials Modifying properties for a purpose Commercially available types and sizes of materials Manufacturing specification/working drawings	Tools, equipment and processes Quality control How materials are cut shaped and formed to a tolerance The preparation and application of surface treatments and finishes Types of forces and reinforcing materials	Investigate, analyse and evaluate the work of past and present designers/ companies Investigate, analyse and evaluate the work of past and present designers/ companies Generating imaginative and creative designs Using primary and secondary data to understand client and/or user needs.	Market research, interviews, human factors Constraints that are presented to designers Isometric and perspective designs Exploded diagrams Working drawings Computer-based tools Audio and visual recordings Modelling	NonExamAssessment part 1 Identify, investigate and outline design possibilities Identifying & investigating design possibilities Producing a design brief & specification	NonExamAssessment part 2 Design and make prototypes that are fit for purpose Generating design ideas Developing design ideas Realising design ideas	NonExamAssessment part 3 Analyse and evaluate Analysing & evaluating	Robotics, automation and production in industry Production techniques and systems – automation Enterprise Market pull and technology push Sustainability and the environment Critical evaluation of new and emerging technologies – planned obsolescence Design for maintenance Renewable and non-renewable resources Modern materials Smart materials Composite materials Technical Textiles Material properties Functionality Aesthetics	Tools, equipment and processes Quality control How materials are cut shaped and formed to a tolerance The preparation and application of surface treatments and finishes Types of forces and reinforcing materials	Investigate, analyse and evaluate the work of past and present designers/ companies Investigate, analyse and evaluate the work of past and present designers/ companies Generating imaginative and creative designs Using primary and secondary data to understand client and/or user needs. Market research, interviews, human factors Constraints that are presented to designers Isometric and perspective designs Exploded diagrams Working drawings Computer-based tools Audio and visual recordings Modelling
Concepts	New and Emerging Technologies How new and emerging technologies have changed the way we live and how they continue to shape the modern world.	Energy, materials, systems and devices How power is generated from various sources, new materials, the use of systems and various devices to manipulate power and movement	Materials and their working properties How primary sources of materials are developed into working materials. Recognise the characteristics of different materials. Understand the physical and working properties of a range of materials	Specialist technical principles. How forces and stresses affect materials and objects. Functionality, ecological and social footprint. Scales of production	Designing and making principles How to investigate data and the work of others.	Designing and making principles Design strategies and communication of design ideas	Practical application of Core technical principles, Specialist technical principles and Designing and Making principles	Practical application of Core technical principles, Specialist technical principles and Designing and Making principles	Practical application of Core technical principles, Specialist technical principles and Designing and Making principles	Revision of New and Emerging Technologies and Energy, materials, systems and devices	Revision of Specialist technical principles	Revision of Designing and making principles
Common Misconceptions	Failing to understand the importance of wider social and environmental issues in modern design. Not understanding the large implications of automation on product quality, availability and price	Confusing the properties of modern and smart materials compared to traditional design materials Failing to understand the importance of product carbon footprint and the future implications for available products and materials	Not understand that material properties can be changed and manipulated to accommodate desired design outcomes Failing to understand the link between primary sources and finished materials	Not appreciating the scientific link between DT and Science when exploring forces and stresses in materials Failing to appreciate the link between scales of production and product cost to the consumer	Not fully appreciating the iterative nature of the design process when developing products	Failing to understand that the design process is a series of stages to be fully completed rather than an exercise in producing an object with no design history	Not allocating adequate importance to the role of the client when developing design briefs and design ideas	Failing to understand that the design process is a series of stages to be fully completed rather than an exercise in producing an object with no design history	Not fully appreciating the important role of analysis and evaluation when developing a product and when a product has been in use by the target market	Failing to plan revision so that it is a series of regular and repeated sessions covering different themes and concepts related to the subject	Not fully appreciating the importance and mark allocations of the three exam sections.	Not fully utilising correct exam technique Failing to taper the revision as the exam approaches
AO	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles. AO3: Analyse and evaluate: wider issues in design and technology.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles. AO3: Analyse and evaluate: wider issues in design and technology.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles. AO3: Analyse and evaluate: wider issues in design and technology.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles. AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and others wider issues in design and technology.	AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose. AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and other	AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and other	AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose. AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and others wider issues in design and technology.	AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose. AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and others wider issues in design and technology.	AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose. AO3: Analyse and evaluate: design decisions and outcomes, including for prototypes made by themselves and others wider issues in design and technology.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles.	AO4: Demonstrate and apply knowledge and understanding of: technical principles designing and making principles.