Curriculum Progression Pathway

DESIGN TECHNOLOGY

Why is the study of Design and Technology important?

Design and Technology is a practical and valuable subject. It enables students to actively contribute to the creativity, culture, wealth and well-being of themselves, their community and their nation. It teaches how to take risks and so become more resourceful, innovative, enterprising and capable. Students develop a critical understanding of the impact of design and technology on daily life and the wider world. Additionally, it provides excellent opportunities for students to develop and apply value judgments of an aesthetic, economic, moral, social, and technical nature both in their own designing and when evaluating the work of others.

What students will know and understand from their study –

Across the key stage 3 curriculum the aims of Design and Technology curriculum is to include the development of capability within the subject, along with broad general skills. Below details the skills and knowledge that will be gained across the three years.

What skills will the study of Design and Technology teach you?

Design and Technology use knowledge, skills and understanding from within the subject itself and also a wide range of other sources, especially but not exclusively science and mathematics. Design and Technology will teach you to:

- Develop resilience by not being afraid of challenges when solving problems, but to break them down and keep trying.
- Be creative in developing solutions to real world problems.
- Use modelling and annotated sketches to develop and communicate ideas.
- How to act responsibly within a practical environment thinking of the safety of yourself and others..
- Identify how to competently use a range of practical techniques across a range of disciplines.

- Apply and use CAD/CAM equipment to design and manufacture a range of products and components considering scale of production and precision.
- Work independently and part of a team to solve complex problems.
- Construct reasoned arguments to ethical, social and moral problems that have arisen due to technology and communicate these in an effective way.
- Identify links between different materials and contextual references.
- Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups.
- Understand and apply the principles of nutrition and health.
- Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet.
- 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 recipes).
- Understand the source, seasonality and characteristics of a broad range of ingredients.

What will you know and understand from your study of Design and Technology?

- How to classify materials including smart materials and discuss their physical properties.
- How to use simple electronic circuits incorporating inputs and outputs.
- How to manufacture products with reference to their materials physical properties.
- Students will learn to use and adjust equipment and machinery dependent on tasks.
- Use learning from science and mathematics to help design and manufacture components and products.
- Students will learn to consider the influence of a range of lifestyle factors and consumer choices when designing and analysing products.
- Students will know and understand additional factors to consider such as ergonomics, anthropometrics or dietary needs.
- How to use a variety of approaches, for example biomimicry and user-centred design to generate creative ideas and avoid stereotypical responses.

- Students will be able to evaluate their work against an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their product to their own designing and making.

- How to competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment.

Curriculum Planning

It is recognised schools are teaching a wide range of KS4 specifications, the themes and subject content have been identified from the following sources :

- The Design and Technology programmes of study for KS3

- GCSE subject content for Design and Technology

- WJEC Level 1/2 in Hospitality and Catering.

- BTEC Technical award Engineering

Curriculum content only covers core knowledge common to all KS4 specifications. It is expected schools will include additional content from their chosen specification into their planning.

Context – Subject Curriculum Progression Overview

DESIGN AND TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW OUTWOOD ACADEMY CITY			
	Year 7	**Year 8**	**Year 9**
	Pewter cast keyring: Year 7 students will learn about H&S in the workshops and how they can work safely and productively in them. Students will be introduced to a variety of materials including Pewter, MDF board and Acrylic. Knowledge introduces students to biomimicry and producing designs to a specification. Students will be introduced to mood boards and given good examples to work with. They will be introduced to a specification and how to analyse a design brief. They will learn about basic materials such as MDF, Pewter and Acrylic. They will learn the properties of the materials and how to cut and shape them. Students will be introduced to mould making and pewter casting. Students will evaluate their outcomes at multiple stages. They will evaluate their initial design, then create a paper template to check the accuracy of their silhouette then finally evaluate the finished product.	**Souvenir Clock:** Year 8 students will learn about different designers feeding into the KS4 curriculum. They will take influence from designers to produce a clock face that mimics their style. Students will have the opportunity to work with MDF, Pine and Mechanisms. The students will also get the opportunity to use computer aided design. This will provide students with a greater knowledge of CAD - Computer Aided Design - Introduced using the 2D design software and vectorising a suitable image, referring to design brief They also get the opportunity to develop their designing skills by producing designs for the lamp which will be a fully functioning product. Knowledge covers Softwoods and Hardwoods, tools and permanent and non permanent fixings. Skills cover how to mark out, how to cut a finger joint and how to use 2D design to effectively create a clock face.	**Lamp:** Year 9 students will learn about sustainability and sustainable design. In year 9 they will make a lamp. They will learn about Polymers and simple circuits with inputs and outputs. Students will create a pine framed lamp in anglepoise style. They will be encouraged to think creatively to create a shade for their lamp from a recycled polymer. Students will learn about simple circuits by populating a circuit to create the light for their lamp. Knowledge covers cutting using Hegner saws, coping saws and using files to create a shaped base. They will learn about drilling holes and differences between screws/bolts. Students will be encouraged to think more independently and make their own design choices. Students will be encouraged to evaluate their finished product.

	Graphics **Board game** Year 7 students will learn how to use Photoshop to create a board game. They will make the game, box and any relevant pieces. Students will be encouraged to evaluate at stages throughout the project where they will test and refine their ideas. Students will learn how to use Photoshop and gather and share images. They will learn about gathering research and how to utilise the internet to help with research. They will learn to think about different users and how to design with a demographic in mind. They will know about how to fold an existing net and incorporate their designs into this.	**Graphics** **Chocolate mould** Year 8 students will learn about the purpose of packaging and how to create their own. They will learn about net packaging and tessellation, also how to add their designs in the form of logos and graphics. They will create a design for 4 individual chocolates and then create a reusable mould. They will also create the packaging in their chosen theme to house the chocolates. They will learn how to incorporate CAD CAM into their design process through the use of laser cutters and vacuum forming machinery. They will know about research methods, primary and secondary. They will know how to choose the correct materials in paper and board and how to create a net design. They will know how to create a draft angle for moulding and the purpose this holds.	**Graphics** **Album cover** Year 9 students will focus on designing an album cover. They will learn about three designs and learn how to use their designs to influence their design choices. They will use photoshop and learn new techniques to produce an album cover consisting of many layers. They will learn how to switch layers off and on, how to manipulate text and how to import images into the program. Students will know about commands in photoshop, they will know how to use these commands to speed up the use of the program. They will

	Year 7 food **Health and safety** **Eatwell guide** **Processed food** The focus for year 7 food is learning how to work safely in a kitchen environment. They will learn how to sort hazards and prevent/minimise them. They will also learn about the Eatwell guide and how to eat healthy meals. Students will learn how to cook a variety of predominantly savoury meals. Using the bridge and claw grip to safely cut food. Using the correct chopping boards and how to identify them. Blind baking and how to use the blind baking method to produce jam tarts. How to make simple dough to make a pizza and cook this in a safe way.	**Year 8 food** **Energy and nutrition** **Special diets** **Organic farming** The focus for year 8 food is energy and nutrition. They will learn about where energy comes from and about sugar and the origins of sugar. They will taste test sugar and learn how to evaluate different tastes. They will also learn about people who eat special diets for a variety of circumstances such as allergies, dietary requirements and religion. They will also learn about organic foods and the importance of organic farming. Students will learn how to make honeycomb and melting sugar. They will learn how to analyse tastes and make informed judgements. They will learn about culture and cultural beliefs and how this influences food choices. They will also learn about dietary requirements and how to adapt recipes to suit different requirements.	**Year 9 food** **What it takes to be a Baker** **Kitchen brigade** Year 9 food curriculum will prepare students for KS4 learning about the requirements of baking and working as a baker. They will learn about how to operate as part of a kitchen team and the importance of different job roles such as head chef and waiters. Students will learn about baking and using an oven, they will learn how to make and roll out dough then to blind bake doubt to make pastries. They will start to learn about the job roles in the kitchen team and this will feed into KS4 Hospitality and catering curriculum.

DESIGN AND TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW - AQA design and technology		
	Year 10	**Year 11**
Autumn Term 1 **Core Knowledge and principals**	**Core Knowledge and principals** New and emerging technologies Energy generation and storage Developments in new and modern materials **Skills** Keyring Trinket box	**NEA**
Autumn Term 2	**Core Knowledge and principals**	**NEA**

Core Knowledge and principals	Systems approach to designing Mechanical devices Materials and their working properties **Skills** Injection moulding Thermoplastics and laser cutting	
Spring 3 **Core Knowledge and principals**	**Core Knowledge and principals** Forces and stresses Ecological and social footprint Scales of production Surface treatments and finishes **Skills** Orthographic projections Wood joints	**NEA**

Spring 4	**Core Knowledge and principals** The work of others Primary and secondary data Communication of design ideas Prototype development Selection of materials and components **Skills** Design and make challenge ‘Gadget holder’	**NEA**

Summer 5 **Core Knowledge and principals**	**Core Knowledge and principals** Tolerances Specialist tools and equipment Specialist techniques and processes Materials management **Skills** Design and make challenge ‘Gadget holder’	**NEA**

Summer 6 **Core Knowledge and principals**	**NEA content review** Context analysis Customer research	

Term	**Hospitality and catering**	
	Year 10	**Year 11**
Autumn term 1 **Core Knowledg**	Unit 1 Hospitality and catering providers Food service Ratings and standards Job roles	**Unit 2**

e and principals	Qualifications, skills and attributes <u>Practical skills</u> Students will learn to present cooked food through a variety of techniques such as slicing, chopping and colour theory. They will learn how to prepare bun and piping techniques using complex piping techniques. They will learn about poaching food and make eggs benedict.	
Autumn term 2 **Core Knowledge and principals**	Unit 1 Working conditions Factors affecting success The environment Kitchen layout Specialist equipment Front of house <u>Practical skills</u> Students will learn how to shape raw meat and make a burger patty. They will serve this into a burger alongside mayonnaise targeting complex levels of skill. They will watch demonstrations about how to fillet fish and make their own fish pie with potato toppings. They will also learn how to whisk eggs to make meringue nests.	**Unit 2**
Spring term 3 **Core Knowledge and principals**	Unit 1 Kitchen documentation Customer needs, requirements and rights Health and Safety Risks and controls <u>Practical skills</u> Students will learn how to make fresh pasta and use a pasta roller. They will use this pasta to make ravioli using a filling of their choice. Students will be encouraged to think about sustainability and health benefits. They will learn about enriched yeast dough and making hot crossed buns. They will learn how to adapt recipes and make a filling for a	**Unit 2**

	Mediterranean flan using the blind baking method.	
Spring term 4 **Core Knowledge and principals**	Unit 1 Food related to the causes of ill health Bacteria The environmental health officer Food safety laws Recommend and justify provision <u>Practical skills</u> Students will learn the complex skill of making choux pastry and piping. This skill will enable them to make sweet dishes such as eclairs and profiteroles. They will also practise their skills in handling and preparing raw meat. They will make chicken curry and learn about marinating chicken, also wider food choices and how this recipe could be adapted to make a vegetarian option.	**Unit 2**
Summer term 5 **Core Knowledge and principals**	Unit 1 **Revision of topics** <u>Practical skills</u> Students will learn to make use of seasonal vegetables and produce by making a vegetable soup. They will think about the texture and visual appeal of their dishes by considering cutting/chopping techniques and garnishes. They will also learn to use a bain marie and make chocolate mouse. These dishes help encourage students to think about menu preparation and choice.	**Unit 2**
Summer term 6 **Core Knowledge and principals**	Unit 1 **Mock exams and preparation for Unit 2**	Exam revision

Assessment

Assessment Objectives Design and Technology

	Design	Make	Evaluate	Technical Knowledge
Y10	1.Understand that all design and technological practice takes place within contexts which inform outcomes 2.Investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas 3.Use different design strategies, such as collaboration, user-centred design and	1.Develop and apply in-depth knowledge by selecting and working with appropriate materials and components in order to produce a prototype 2.Apply in depth knowledge using appropriate and accurate marking out methods including measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste. 3.Follow procedures for safety and write risk assessments.	1.Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups. 2.Critically evaluate new and emerging technologies to inform design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment.	1.Understand the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems. 2.Know how energy is generated and stored in order to choose and use appropriate sources to make products and to power systems.

	systems thinking, to generate initial ideas and avoid design fixation. 4.Design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation 5.Consider additional factors such as ergonomics and anthropometrics.	4.Use specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used 5.Use appropriate surface treatments and finishes for functional and aesthetic purposes	3.Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.	3.Understand developments in modern and smart materials, composite materials and technical textiles. 4.Understand 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 5.Understand how the use of programmable components are used to embed functionality into products in order to enhance and customise their operation 6.Understand the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces: 7.Know how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines. 8.Use learning from science and maths to help design and make products that work.

Y9	1.Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacture etc. 2.Consider the influence of a range of lifestyle and consumer choices when designing products. 3.Take creative risks when making design decisions. 4.Analyse where human values may conflict and compromise has to be achieved. 5.Decide which design criteria clash and determine which should take priority. 6.Consider additional factors such as ergonomics and anthropometrics.	1.Produce costings spreadsheets for products they design and make. 2.Match and select suitable materials and their fitness for purpose. 3.Adapt their method of manufacture to changing circumstances. 4.Recognise when it is necessary to develop a new skill or technique. 5.Follow procedures for safety and understand the process of risk assessments. 6.Make independent choices when selecting and using a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely. 7.Apply a range of finishing techniques to a broad range of materials.	8.Evaluate the concept of circular economy approaches in relation to product development and consumption. 9.Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups. 10.Evaluate new and emerging technologies. 11.Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.	1.How to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor. 2.How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines. 3.Use learning from science and maths to help design and make products that work. 4.Understand the properties of materials, including smart materials, and how they can be used to advantage.

Y8	1.Use research and **begin to exploration**, such as the study of different cultures, to identify and **begin understand** user needs. 2.To identify and solve issues within a design development task. 3.Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of uses. 4.Use a variety of influences, to generate creative ideas and avoid stereotypical responses. 5.Use 2D and 3D to model and develop their ideas. 6.Use CAD software to validate their designs in advance of manufacture. 7.Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools. 8.Consider additional factors such as ergonomics and anthropometrics.	1.Select from a wider, more complex range of materials and components, taking into account their properties. 2.Make simple use of planning tools for instance Gantt charts, communicate their plans clearly so that others can implement them. 3.Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives. 4.Make independent choices when selecting and using CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality. 5.Follow procedures for safety and understand the process of risk assessments. 6.Make independent choices when selecting and using a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely. 7.Apply a range of finishing techniques to a broad range of materials.	1.Select appropriate methods to evaluate their products in use and modify them to improve performance. 2.Produce shorts reports making suggestions for improvements. 3.Evaluate products that they are less familiar with using themselves. 4.Evaluate products considering life cycle analysis. 5.Evaluate how products can be developed considering the concept of cradle to grave. 6.Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups. 7.Evaluate new and emerging technologies. 8.Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.	1.How to apply computing and use electronics to embed intelligence in products that responds to inputs. 2.How to control outputs such as actuators and motors. 3.How to use software and hardware to to develop programmes and transfer these programmable components for example, microcontrollers. 4.How to make use of microcontrollers in products they design and manufacture themselves. 5.How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines. 6.Use learning from science and maths to help design and make products that work. Understand the properties of materials, including smart materials, and how they can be used to advantage.

Y7	1.Use research, such as the study of different cultures, to identify user needs. 2.Be able to outline a simple specification to inform design ideas and guide their thinking. 3.Use 2D packages to model their ideas. 4.Produce models of their ideas using CAM to test ideas. 5.Be able to independently generate creative ideas inform by stimulus using annotations to explain key features relating to brief/specification. 6.Consider additional factors such as ergonomics and anthropometrics.	1.Produce ordered sequences and schedules for manufacturing products they design detailing resources required. 2.Make use of specialist equipment to mark out materials. 3.Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives. 4.Select and use CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality. 5.Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials. 6.Follow procedures for safety and understand the process of risk assessments. 7.Select and use a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely. 8.Apply a range of finishing techniques to a broad range of materials.	1.Evaluate their products against their original specification and identify ways to improve them. 2.Actively involve others in the testing of their products. 3.Evaluate products through disassembly to determine how they are constructed and function. 4.Evaluate the positive and negative impact that products can have in the wider world. 5.Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups. 6.Evaluate new and emerging technologies. 7.Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.	1.How to classify materials by structure e.g. hard words, soft wood, ferrous and non-ferrous, thermoplastics and thermosetting plastics. 2.Consider the physical properties of materials. e.g brittleness malleability. 3.How to use simple electronic circuits incorporating inputs and outputs. 4.Consider textile fibre sources e.g. natural and synthetic. 5.How materials can be cast in moulds. 6.Make use of sensors to detect heat, light etc such as thermistors and light dependent resistors. 7.How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines. 8.Use learning from science and maths to help design and make products that work. 9.Understand the properties of materials, including smart materials, and how they can be used to advantage.

Assessment Grids – Age Related Assessment Descriptors

Design and Technology

Scheme of Work	Design	Make	Evaluate	Technical Knowledge
Excelling *Working well above ARE* (Trajectory for Grade 8 – 9)	I can explain how engineers/ designers from different sectors contribute /generate a product. I can create imaginative, creative and innovative ideas, fully avoiding design fixation and with full consideration of design functionality, aesthetics and innovation. I can produce detailed annotation that clearly justifies how I have considered the user/client needs and links directly to the context selected. I can produce a complex investigation into the work of others and use this to inform my designs.	I can develop an improved final solution using CAD and modelling in relation to the brief. I have correctly used tools, equipment and materials (including CAM where appropriate) have been consistently used or operated safely with a high level of skill. I can produce a high quality prototype that has the potential to be commercially viable and has been made to meet the needs of the end user. I have evidenced a constant use of quality control to ensure a high quality, accurate prototype. I have clearly shown where I have adapted my work to include feedback from QC checks and/or user.	I can fully justify the development of an improved final solution and evaluate use of the design process, with reference to the brief and peer review. I have a comprehensive understanding of testing, analysing and evaluating existing products and ongoing work. I used judgements for independent and external feedback to inform and record modifications that I make.	I have knowledge and understanding of the impact of new and emerging technologies from a user, designer and manufacturers point of view. I can discuss and explain the impact of resources consumption on the planet and measure taken to improve this. I can implement sensitive approach with design and evaluation, and avoid negative impact on individuals and groups. E.g inclusive design/religious beliefs. I can identify and explain when/why and how various production techniques and systems are used in manufacture. For example, automation, JIT.

Exceeding *Working beyond ARE* (Trajectory for Grade 6 – 7)	I research and explore relevant information based on the users needs. I know how to use social, moral and cultural information to understand the user more clearly. I can independently solve design problems and understand how to develop problems that are given to me. I have developed a specification that allows me to be innovative, functional, and create an appealing design that responds to the users needs. I have used a variety of approaches, for example, biomimicry and user centred design which has generated creative ideas that avoid stereotypical response to the brief.	I can select specialist tools in my practical and my choices are justified. I justify the reasons for my choice of materials, taking into consideration their properties. I justify the process that I choose to make my product. I can use CAM in my work. I am accurate and precise when I work. I can work very safely and can coach others to do.	I can compare and contrast existing products, analysing them and explaining how this will influence my design. I understand and can explain developments in DT, for example use of robotics in manufacturing. I test, evaluate and refine my ideas and products against a specification. I always take into account the views of users/groups. I understand the responsibilities of designers and engineers and clearly show this in my work. This could include, inclusive design, sustainability etc. I can evaluate the impact of my product on individuals, society and the environment.	I understand and use the properties of materials and the performance of structural elements to achieve functioning solutions. I understand how more advanced mechanical systems are used in my products and enable changes in movement and force. I understand how more advanced electrical and electronic systems can be powered and used in my product. I apply computing and use electronics to ebed intelligence in my product that respond to inputs, and control output, using programmable components.

Achieving *Working at ARE* (Trajectory for Grade 4 – 5)	I use research to state and describe the users needs. I can generate at least three different ideas, listing the constraints and develop them so they're improved following user/specification analysis. I analyse research to write a full specification which include users views/needs. I can select different methods to develop and improve ideas e.g. CAD/Modelling in response to the specification. I annotate ideas in response to the specification and clearly show how/why the design has been improved.	I can describe the tools and equipment I use. I can describe a range of materials that I use. I can describe the processes that I use. My work is generally accurate and pay attention to quality of finish. I always work safely adhering to workshop safety rules.	I analyse existing products on the market that are relevant and use these to inform my ideas. I can test and evaluate my product against the specification and improve my product as a result. I understand what my responsibilities are as a designer including reference to positive and negative impacts that products may have on the wider world. I can describe new technologies and smart materials and describe how they can help the environment and end product.	I can understand the properties of materials and select them to improve functioning solutions. I understand how electrical and electronic systems can be powered and used in their products. I apply computing and use electronics in my product that respond to input and controls outputs. I understand how mechanical systems are used in my product to enable changes in movement and force. I can independently select and use how CAD/CAM in design and manufacture of my product (identify between 2D and 3D).

Developing *Working towards ARE* (Trajectory for Grade 2 – 3)	I use research to identify the users needs. I can generate at least three different ideas and develop them so they're improved. I use research to write a basic specification. I use different methods to develop and improve ideas e.g. CAD/Modelling. I annotate ideas so they're clear to others.	I can name the tools and equipment I use. I can name a range of materials that I use. I can list the processes that I use. My work is mostly accurate. I work safely adhering to workshop safety rules.	I look at existing products on the market that are relevant and use these to inform my ideas. I can test and evaluate my product against the specification. I understand what my responsibilities are as a designer and show this in my work. I know about new technologies and smart materials and know how they can help the user.	I can recall the properties of materials. I understand systems and control and know what an input and output is. I understand mechanical systems. I can select how CAD/CAM can be used in manufacture (identify between 2D and 3D).
Emerging *Working below ARE* (Trajectory for Grade U – 1)	I can outline how the product meets my own needs. I know what a specification is and can work from one. My ideas are sketched and labelled with basic notes.	I can prepare myself for practical. I can name some of the tools I use. I can use equipment safely. Practical work is reasonably accurate.	I look at products to help me with my ideas. I can outline what I designed and what I made and state improvements needed. I know what some of my responsibilities are as a designer. I know a bit about new technologies and smart materials and how they can help the user.	I can identify the properties of some materials. I understand a little about systems and control and know what an input and output is. I understand basic mechanical systems. I know how CAD/CAM can be used in manufacture.

Assessment Objective	Design AO1	Make (Include H&S) AO2	Evaluate AO3	Technical Knowledge AO4

(Assessment Objectives refer to Design and Technology Programmes of Study)

Wider Subject Curriculum – *enrichment, homework programs, quizzing, awards, trips, visits, reading / vocabulary lists, competition etc.*

Resources

Glossary of key terms, rules & formula - *to be spelt / used correctly*

Key Terms

Vocabulary	Description
Sustainability	Working in a way that will ensure a continued supply of resources and energy for future generations (renewable/non-renewable/finite).
Environmental	Concerned with the impact or change in the environment.
Aesthetic	Our perception of beauty including sight, sound, smell, touch (mainly visual for Product Design).

Texture	The feel, appearance or consistency of a surface, substance or fabric.
Durability	The ability of a material to be hard-wearing.
Hardwoods	Come from deciduous or broadleaf trees. They are generally slow growing, hard, sold by cubic meter then rough sawn to size or mould (dowel).
Softwoods	Come from coniferous trees with needles instead of leaves. They are generally faster growing, softer, easier to work with. Supplied in standard sizes that are either rough sawn or planed smooth (PSE).
One-off	Only one product is made at a particular time (usually high quality/unique).
Batch	A series of identical products are made together, in small or large numbers (usually for a specific event).
Mass production	Products made on a production line with each worker responsible for a particular stage. Products are made in larger numbers to reduce the cost of each item.
Prototype	An accurate or working representation of what the product will do.
Quality control	Guarantees the accuracy of a product (size, material quality/ visual features).
Quality Assurance	Checks the machines, systems and staff within an organisation that make the products.
Risk assessment	The likelihood of safety problems arising from an activity (in designing and making a product).

CAD	Computer aided design is a drawn product or part of a product on a software package that can then be exported to an CAM machine (Increases accuracy and ease of repeat cuts).
CAM	Computer aided manufacture, a machine that turns a digital drawing into numerical code that plots a path for an item to be cut/drilled/milled out of a section of material.
Thermoplastics	These soften when heated and can be reshaped.
Thermosetting plastics	Heated and moulded into shape these plastics cannot be reshaped with heat because the polymer chains have been interlinked.