#### SUBJECT ON A PAGE

Design & Technology

Develop pupils'

aptitude through

skills which build

upon prior learning

#### At Berry Hill Primary School we believe through developing the essential 'Characteristics of Effective Learning' in the early years, we provide the foundations of good designers. Motivated and curious pupils persevere, enjoy challenges and solve problems. Pupils develop and revisit knowledge to form building blocks to higher levels of learning. Pupils identify the needs and wants of a consumer and creatively design and make innovative products. Inspired by others, pupils endeavour to succeed and know nothing is out of their reach!

Teach pupils to become proficient in identifying and using transferable skills

Celebrate pupils' quality design and manufacture of products

#### Implementation - How do we achieve our aims?

"Design & Technology should be the subject where mathematical brainboxes and science whizzkids turn their bright ideas into useful products" James Dyson

Intent - we aim to...

#### Authentic outcomes

Be Kind

Work Hard

Instil the importance

of the 'analyse,

evaluate' cycle

X

design, make and

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The concept of authentic outcomes underpins the Design & Technology curriculum. Pupils are motivated to design, produce and evaluate their products based on producing a genuine product for a very specific audience or end user.



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	EYFS	Y1	Y2	Y3	Y4	<b>Y</b> 5	Y6	
STRUCTURES	X	X	X	X	X		X	
MECHANISMS / SYSTEMS			X		X	X		
ELECTRICAL SYSTEMS (KS2)					X	X		
COOKING & NUTRITION		X		X		X		
TEXTILES	X	X					X	
DIGITAL WORLD (KS2)				X			X	

Talla a flama flama a Manual a

Design & Technology process and structure of knowledge acquisition within each unit of study

KNOWLEDGE

TECHNICAL

KNOWLEDGE

**ADDITIONAL** 

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Children are proud of

their learning journey and

are inspired to take this

further

#### The national Curriculum

#### when designing and making, key stage 1 pupils

#### should be taught to.

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
- select from and use a range of tools and equipment to perform practical tasks
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- explore and evaluate a range of existing products evaluate their ideas and products against design criteria
- build structures, exploring how they can be made
- stronger, stiffer and more stable explore and use mechanisms, in their products.
- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

#### when designing and making, key stage 2 Pupils

#### should be taught to.

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or aroups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.
- select from and use a wider range of tools and equipment to perform practical tasks accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world
- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products
- understand and use electrical systems in their products
- apply their understanding of computing to programme, monitor and control their products.
- understand and apply the principles of a healthy and varied diet
- 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 own recipes]
- understand the source, seasonality and characteristics of a broad range of ingredients

# STRUCTURES JOURNEY OF A PRODUCT DEVELOPER

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN	<ul> <li>Term 1</li> <li>To know how to make verbal plans of what model to make and material choices.</li> <li>To know that they need an intended order of how to put their model together</li> <li>Term 2</li> <li>To know how to describe/ illustrate a design for a product.</li> <li>To know how to use knowledge of exploration to inform designs.</li> </ul>	<ul> <li>To know that a clear design criteria is important.</li> <li>To know how to include individual preferences and requirements in a design.</li> </ul>	<ul> <li>To know how to generate and communicate ideas using sketching and modelling.</li> <li>To know that there are different types of structures, found in the natural world and in everyday objects.</li> </ul>	<ul> <li>To know that a design has key features that appeal to a specific person/ purpose</li> <li>To know how to draw, label a structure design using 2D shapes and labelling the 3D shapes that will create the features</li> <li>To know how to list the materials needed and colours.</li> <li>To know how to design and/or decorating part of the structure on CAD software.</li> </ul>	<ul> <li>To know that frame structures are designed to support weight</li> <li>To know that stable structures are also designed to be aesthetically pleasing.</li> <li>To know that the materials are selected to create a desired effect.</li> </ul>		<ul> <li>To know how to design a variety of different structures To know that careful consideration needs to be given as to how the structures will be used</li> <li>To know that certain design structures would be effective or ineffective for the purpose of the product.</li> </ul>
MAKE	<ul> <li>Term 1</li> <li>To know how to hold scissors and begin to know how to use scissors with a variety of materials</li> <li>To know how to join same and different materials in a variety of ways (temporary and permanent.</li> <li>Term 2</li> <li>To know how to explore the properties of different materials.</li> <li>To know that the properties of different materials are important when selecting materials for a purpose</li> </ul>	<ul> <li>To know how to make stable structures from card, tape and glue.</li> <li>To Know how to turn 2D nets into 3D structures.</li> <li>To know that following instructions provides a sequence for assembling a structure</li> <li>To know how to cut out a template</li> <li>Unit Specific to windmills - To know how to make functioning turbines and axles</li> </ul>	<ul> <li>To know that when making a structure the design criteria is followed.</li> <li>To know how to create structures and joints from paper/card and tape.</li> <li>To know how to build a strong, stiff structure by folding paper.</li> </ul>	<ul> <li>To know how to construct a range of 3D geometric shapes using nets.</li> <li>To know that individual designs have special features.</li> <li>To know how to create special features for individual designs.</li> <li>Know how to make facades from a range of recycled materials.</li> </ul>	<ul> <li>To know how to arrange different shaped frame structures.</li> <li>To know how to make a variety of free-standing frame structures of different shapes and sizes.</li> <li>To know how tp select appropriate materials to build a strong structure and cladding.</li> <li>To know how to reinforce corners to strengthen a structure.</li> <li>To know that a design is created in accordance with a plan.</li> <li>Know how to create different textural effects with materials.</li> </ul>		<ul> <li>To know how to build a range of different structures drawing upon new and prior knowledge of structures.</li> <li>Know how to measure, mark and cut wood to create a range of structures.</li> <li>Know how to use a range of materials to reinforce and add decoration to structures.</li> </ul>
EVALUATE	Term 1 To know how to verbally evaluate their own and others' models with adult support To know how their model matches their plan To know how to improve their model if they were to do it again To know how to explain there are favourite and least favourite part of their model. Term 2 To know how to make predictions about different materials eg whether waterproof. To know how to predict whether products eg float. To know how to test their design and identify what could be done differently. To know how to Investigate how properties such as: shape, structure, size and how affect the success of the product.	<ul> <li>To know how to evaluate a product according to the design criteria</li> <li>To know how to test whether a structure is strong and stable.</li> <li>To know that there are improvements that could be made.</li> <li>To know how to improve the design of the product.</li> </ul>	<ul> <li>To know that different shapes provide different levels of stability.</li> <li>To know how to compare the stability of different shapes</li> <li>To know how to test the strength, stiffness and stability of their own structure .</li> <li>To know that the designs can be improved.</li> <li>To know how to improve the design of a structure</li> </ul>	<ul> <li>To know how to evaluate their own work and the work of others based on the original design criteria</li> <li>To Know how to evaluate the aesthetics of the finished product.</li> <li>To know that the design can be modified for improvements.</li> <li>To know how to make improvements to a design.</li> </ul>	<ul> <li>To know how to evaluate a range of structures.</li> <li>To know that there are characteristics of a design and construction which were the most effective.</li> <li>To know that there are effective and ineffective designs.</li> </ul>		<ul> <li>Know how to Improve a design plan based on peer evaluation.</li> <li>Know how to test and adapting a design to improve it as it is developed.</li> <li>Know that a successful structure meets given criteria.</li> </ul>

## STRUCTURES

### Disciplinary Knowledge JOURNEY OF A PRODUCT DEVELOPER-

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
TECHNICAL	Term 1 To know that there are a range of different materials that can be used to make a model To know that materials are all slightly different Term 3 Use vocabulary to sort materials according to properties	<ul> <li>To know that a structure is something that has been made and put together.</li> <li>To know that different structures are used for different purposes.</li> <li>To know that the shape of materials can be changed to improve the strength and stiffness of structures.</li> <li>To know that certain shapes feature in a structure for a purpose</li> <li>To know that structures can form part of a product which incorporates mechanisms eg axles are used in windmills to make parts turn in a circle.</li> </ul>	<ul> <li>To know that shapes and structures with wide, flat bases or legs are the most stable.</li> <li>To know how the shape of a structure affects its strength.</li> <li>To know that materials can be manipulated to improve strength and stiffness.</li> <li>To know that a structure is something which has been formed or made from parts.</li> <li>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</li> <li>To know that a 'strong' structure is one which does not break easily.</li> <li>To know that a 'stiff' structure or material is one which does not bend easily.</li> </ul>	<ul> <li>To know that wide and flat based objects are more stable.</li> <li>To know that strength and stiffness in structures are important.</li> </ul>	<ul> <li>To know what a frame structure is.</li> <li>To know that a 'free-standing' structure is one which can stand on its own.</li> </ul>		• To know that structures can be strengthened by manipulating materials and shapes.
ADDITIONAL	Term 3 To know that some materials are more suitable for a purpose and why.	<ul> <li>To know that a client is the person I am designing for(vocab)</li> <li>To know that design criteria is a list of points to ensure the product meets (vocab) the client's needs and wants. UNIT SPECIFIC</li> <li>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. (unit specific - substantive</li> <li>To know that windmill turbines use wind to turn and make the machines inside work.</li> <li>To know that a windmill is a structure with sails that are moved by the wind.</li> <li>To know the three main parts of a windmill are the turbine, axle and structure.</li> </ul>	<ul> <li>To know that natural structures are those found in nature.</li> <li>To know that man-made structures are those made by people.</li> </ul>	UNIT SPECIFIC for castles To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a façade is the front of a structure. (Vocab) • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product (vocab)	<ul> <li>To know that a structure is designed for a purpose.</li> <li>To know that cladding can be applied to structures for different effects. (vocab)</li> <li>To know that aesthetics are how a product looks. (vocab)</li> <li>To know that a product's function means its purpose. (vocab)</li> <li>To understand that the target audience means the person or group of people a product is designed for. (vocab)</li> </ul>		<ul> <li>To understand what a 'footprint plan' is.</li> <li>To understand that in the real world, design , can impact users in positive and negative ways.</li> <li>To know that a prototype is a cheap model to test a design idea. (vocab)</li> </ul>

## MECHANISMS / MECHANICAL SYSTEMS JOURNEY OF A PRODUCT DEVELOPER

	EYFS	YEAR 1	YEAR 2	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN			<ul> <li>To know how wheel mechanisms work.</li> <li>To know how to communicate a design for a product using sketching, labelling, listing and annotation. a wheel and axel mechanism. (eg Ferris Wheel)</li> <li>To know that the product is designed for a purpose and the design criteria is specific.</li> </ul>	<ul> <li>To know how to create criteria for a product that moves (eg moving monster)</li> <li>To know that the product criteria is specific for the chosen audience.</li> <li>To know how to communicate the product design to include sketching, labels and annotation.</li> </ul>		<ul> <li>To know how to design a shape that is suitable for the project eg car – shape that reduces air resistance</li> <li>To know how to draw a net to create a structure from.</li> <li>To know that different shapes shapes increase or decrease speed as a result of air resistance.</li> <li>To know how to add graphics to persoalise the design.</li> <li>To know how to communicate the product design to include sketching, labels and annotation.</li> </ul>	<ul> <li>Designing a product for a specific audience. which uses a mixture of structures and mechanisms.</li> <li>Naming each mechanism, input and output accurately.</li> <li>To know how to communicate the product design to include sketching, labels and annotation.</li> </ul>	
MAKE			<ul> <li>To know how to explore characteristics of materials, joining techniques and movement to inform their choice when planning, adapting their design and making their product.</li> <li>To know how to measure, cut, make holes and join materials and components.</li> <li>To know how to assemble a product following a design brief.</li> </ul>	<ul> <li>To know how to make linkages using card for levers and split pins for pivots.</li> <li>To know that the desired movement is achieved by experimenting with linkages; adjusting the widths, lengths and thicknesses of card used .</li> <li>To know how to cut and assemble components neatly.</li> <li>To know how to attach materials and decorate the product to appeal to the audience.</li> </ul>		<ul> <li>Know how to make a model based on a chosen design.</li> <li>To know how to construct parts of the model.</li> <li>.To know how to measure accurately.</li> <li>To know how to mark and cut out flat shapes</li> <li>To know how to join materials including making tabs on flat shapes , glue and assemble flat shapes to make 3D shapes.</li> <li>To know when to add graphics</li> <li>To know how to follow instructions and manipulate components to make the launch mechanism.</li> </ul>	<ul> <li>To know how to followi a design brief to make a product, neatly and with focus on accuracy.</li> <li>To know how to make mechanisms and/or structures using sliders, pivots and folds to produce movement.</li> <li>To know how to use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</li> </ul>	
EVALUATE			<ul> <li>To know how to evaluate the product by referring to the design criteria.</li> <li>To know how to test the product.</li> <li>To know how to suggest improvements to the design .</li> </ul>	<ul> <li>To know how to evaluate own designs against design criteria.</li> <li>To know that peer feedback is valuable and helps to modify a final design.</li> </ul>		<ul> <li>To know how to evaluate the product in terms of the effect of shape on speed and accuracy of workmanship on performance</li> <li>To suggest improvements to the product.</li> </ul>	<ul> <li>To know how to evaluating the product and the work of others .</li> <li>Suggesting points for improvement.</li> </ul>	

## MECHANISMS / MECHANICAL SYSTEMS JOURNEY OF A PRODUCT DEVELOPER

	eyfs	YEAR 1	YEAR 2	YEAR 2	YR 3	YEAR 4	YEAR 5	YEAR 6
TECHNICAL			• To know that different materials have different properties and are therefore suitable for different uses.	<ul> <li>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</li> <li>To know that a lever is something that turns on a pivot.</li> <li>To know that a linkage mechanism is made up of a series of levers.</li> </ul>		<ul> <li>To understand that all moving things have kinetic energy.</li> <li>To understand that kinetic energy is the energy that something (object/person) has by being in motion.</li> <li>To know that air resistance is the level of drag on an object as it is forced through the air.</li> <li>To know that the shape of a moving object will affect how it moves due to air resistance.</li> </ul>	<ul> <li>To know that mechanisms control movement.</li> <li>To understand that mechanisms can be used to change one kind of motion into another.</li> <li>To understand how to use sliders, pivots and folds to create paper- based mechanisms.</li> </ul>	
ADDITIONAL			<ul> <li>Unit Specific for Ferris Wheel- To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</li> <li>To know that it is important to test my design as I go along so that I can solve any problems that may occur.</li> </ul>	• To know that mechanisms are in real-life objects. To know that mechanisms such as: gears, leavers, sliders, axels & wheels, make movement. To know that mechanisms can be found in toys and everyday objects		<ul> <li>To know that a template is a stencil you can use to help you draw the same shape accurately.</li> <li>To know that graphics are images which are designed to explain or advertise something.</li> <li>To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</li> </ul>	<ul> <li>To know that a design brief is a description of what I am going to design and make.</li> <li>To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</li> </ul>	

## ELECTRICAL SYSTEMS (KS2 ONLY) JOURNEY OF A PRODUCT DEVELOPER

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN		• To know how to design a product, giving consideration to the target audience, creating both design and success criteria	<ul> <li>To know that when factors are changed on existing products they alter the form and function of the product.</li> <li>To know how to develop design criteria based on findings from investigating existing products.</li> <li>To know how the design criteria is specific to the target user.</li> </ul>	
MAKE		<ul> <li>To know how to make a product with a working electrical circuit and switch.</li> <li>Know how to select appropriate equipment to cut and attach materials.</li> <li>Know how to assemble the product according to the design and success criteria</li> </ul>	<ul> <li>To know how to alter a product's form and function by tinkering with its configuration.</li> <li>To know how to make a functional series circuit, incorporating a motor.</li> <li>To know how to construct a product with consideration for the design criteria.</li> <li>To know how to break down the construction process into steps so that others can make the product.</li> </ul>	
EVALUATE		<ul> <li>To know how to evaluate and compare existing electrical products.</li> <li>To know how the electrical product works</li> <li>To know what is good and bad about the different products .</li> <li>To know what features make a good design.</li> <li>To know how to test and evaluate the success of their product, compare to design criteria and suggest improvements</li> </ul>	<ul> <li>To know how to test own and others finished products</li> <li>, To know how to identify what went well and making suggestions for improvement.</li> <li>To know how to gather images , information and analysing existing related products.</li> </ul>	
TECHNICAL		<ul> <li>To know that electrical conductors are materials which electricity can pass through.</li> <li>To know that electrical insulators are materials which electricity cannot pass through.</li> <li>To know that a battery contains stored electricity that can be used to power products.</li> <li>To know that an electrical circuit must be complete for electricity to flow.</li> <li>To know that a switch can be used to complete and break an electrical circuit.</li> </ul>	<ul> <li>To know that series circuits only have one direction for the electricity to flow.</li> <li>To know when there is a break in a series circuit, all components turn off.</li> <li>To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</li> <li>To know that a motorised product is one which uses a motor to function</li> </ul>	
ADDITIONAL		• Subject Specific for Torches. To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.	<ul> <li>To know that product analysis is critiquing the strengths and weaknesses of a product.</li> <li>To know that 'configuration' means how the parts of a product are arranged.</li> </ul>	

### COOKING & NUTRITION

# Disciplinary Knowledge JOURNEY OF A PRODUCT DEVELOPER-

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN	To know that packaging is designed to appeal and informs us of the product. To know how to design a packaging for a product by-hand or on ICT software. To communicate by drawing and labelling the ingredients for the smoothie.		<ul> <li>To develop a recipe for a healthy and nutritious dish.</li> <li>To know how to select seasonal ingredients,</li> <li>To know that when designing consideration is given to the taste, texture, smell and appearance of the dish.</li> </ul>		<ul> <li>To know how to adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</li> <li>To know how to amended the method to incorporate the relevant changes to ingredients.</li> <li>To know how to design an appealing packaging to reflect a recipe.</li> </ul>	
MAKE	<ul> <li>To know how to chop fruit and vegetables safely</li> <li>To know how to blend solid ingredients to create a liquid</li> </ul>		<ul> <li>To know how to prepare themselves and a workspace to cook safely in.</li> <li>To know the basic rules to avoid food contamination.</li> <li>To know how to follow the instructions within a recipe.</li> </ul>		<ul> <li>To know how to cut and preparing vegetables safely.</li> <li>To know how to use equipment safely, including knives, hot pans and hobs.</li> <li>To know how to avoid cross-contamination.</li> <li>To know how to follow a step by step method carefully to make a recipe.</li> </ul>	
EVALUATE	<ul> <li>To know how to evaluate different food combinations. Through describing the appearance, smell and taste.</li> <li>To know how to use product knowledge to support the design of the packaging.</li> </ul>		<ul> <li>To know how to establishing and use design criteria to help test and review dishes.</li> <li>To know the benefits of seasonal fruits and vegetables and the impact on the environment.</li> <li>Suggesting points for improvement when making a seasonal dish</li> </ul>		<ul> <li>To know how to Identify the nutritional differences between different products and recipes.</li> <li>To know how to identify and describe the health benefits of certain food groups.</li> </ul>	
TECHNICAL & ADDITIONAL	<ul> <li>To know how to sort fruits and vegetables.</li> <li>To know how to change solids to liquids.</li> <li>To know that vegetables can grow either above or below ground.</li> <li>To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).</li> </ul>		<ul> <li>To know that not all fruits and vegetables can be grown in the UK.</li> <li>To know that climate affects food growth.</li> <li>To know that vegetables and fruit grow in certain seasons.</li> <li>To know that cooking instructions are known as a 'recipe'.</li> <li>To know that imported food is food which has been brought into the country.</li> <li>To know that exported food is food which has been sent to another country</li> <li>To understand that imported foods travel from far away and this can negatively impact the environment.</li> <li>To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.</li> <li>To know that vitamins, minerals and fibre are important for energy, growth and maintaining health.</li> <li>To know that similar coloured fruits and vegetables often have similar nutritional benefits.</li> </ul>		<ul> <li>To know that meat comes from animals.</li> <li>To know that beef is from cattle and how beef is reared and processed, including key welfare issues.</li> <li>To know that I can adapt a recipe to make it healthier by substituting ingredients.</li> <li>To know that I can use a nutritional calculator to see how healthy a food option is.</li> <li>To know that that 'cross-contamination' means bacteria and germs have been passed onto ready-toeat foods and it happens when these foods mix with raw meat or unclean objects.</li> </ul>	

### TEXTILES

Disciplinary Knowledge

# JOURNEY OF A PRODUCT DEVELOPER-

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN	<ul> <li>Know how to design a simple product</li> <li>To know how to discuss, saying what a good design needs.</li> <li>To know how to design a simple pattern with paper.</li> <li>Know how to make choices of materials</li> </ul>	• To know how to use a template to create a design for a puppet.					<ul> <li>To know how to designing a product in accordance to a specification linked to set of design criteria.</li> <li>Annotating designs, to explain their decisions.</li> </ul>
MAKE	<ul> <li>To know how to hold scissors and develop their fine motor/ /cutting skills.</li> <li>To know that fine motor techniques can be explored and developed eg threading and weaving (under, over technique) with a variety of materials.</li> <li>To know how to use a prepared needle and wool to practise threading.</li> </ul>	<ul> <li>To know how to cut fabric neatly with scissors.</li> <li>To know how to use different techniques join and decorate fabric.</li> <li>to know that there is a sequence to the steps taken when constructing the product.</li> </ul>					<ul> <li>To know how to use a template when cutting fabric to ensure they achieve the correct shape.</li> <li>To know how to use pins effectively to secure a template to fabric without creases or bulges.</li> <li>To know how to cut fabric accurately, in accordance with their design.</li> <li>Know how to sew using a strong running stitch, making small, neat stitches and following the edge.</li> <li>Know how to attaching features to the product (such as appliqué) using thread.</li> <li>Know how to add secure fastenings (such as buttons).</li> <li>To know that there are different decorative stitches which begin to be learned.</li> <li>Know how to sew accurately with evenly spaced, neat stitches.</li> </ul>
EVALUATE	To know how to reflect on a finished product and compare to their design.	<ul> <li>Reflecting on a finished product,</li> <li>Compare to the design.</li> <li>Explain likes and dislikes.</li> </ul>					• To know how to reflect on their work continually throughout the process. To know what went well and how to develop their design, skills to improve their product.
TECHNICAL & ADDITIONAL	<ul> <li>To know that a design is a way of planning our idea before we start.</li> <li>To know that threading is putting one material through an object.</li> </ul>	<ul> <li>To know that 'joining technique' means connecting two pieces of material together.</li> <li>To know that there are various temporary methods of joining fabric by using staples. glue or pins.</li> <li>To understand that different techniques for joining materials can be used for different purposes.</li> <li>To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.</li> <li>To know that drawing a design idea is useful to see how an idea will look.</li> </ul>					<ul> <li>To understand that it is important to design the product with the client/ target customer in mind.</li> <li>To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</li> <li>To understand the importance of consistently sized stitches.</li> </ul>

### DIGITAL WORLD (KS2 ONLY) JOURNEY OF A PRODUCT DEVELOPER

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGN	<ul> <li>To know that problems can be solved with technology. To know how a problem (eg not being seen when out in the dark) can be solved by designing a product, using potential features on a Micro: bit</li> <li>To know how to design a digital product.</li> <li>To know how to design a pouch for the digital product. To know that the design criteria is specific to the consumer.</li> <li>To know how to design a 'point of sale' badge for a product. (to then be made using computer-aided design).</li> </ul>			<ul> <li>To know how to write a design brief from information submitted by a client</li> <li>To know how to develop design criteria to fulfil the client's request</li> <li>to know how to consider and suggesting additional functions for my navigation tool</li> <li>Know how to developing a product idea through annotated sketches</li> <li>Know how to placing and manoeuvring 3D objects, using CAD (Computer Aided Design)</li> <li>Know how to changing the properties of, or combine one or more 3D objects, using CAD</li> </ul>
MAKE	<ul> <li>To know how to create a digital program to control a flashing LED algorithm.</li> <li>To know how to use template when cutting and assembling a product (eg pouch)</li> <li>To know how to follow a list of design requirements</li> <li>To know how to select and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch</li> <li>To know how to apply functional features such as using foam to create soft buttons</li> <li>To know how to create a 'point of sale' badge using CAD.</li> </ul>			<ul> <li>To know that it is important to consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo)</li> <li>To know that the material choices were chosen as part of a product concept for a reason and can explain the reason</li> <li>To know how to program N,E, S,W cardinal compass</li> </ul>
EVALUATE	<ul> <li>To know how to Analysing and evaluating an existing product</li> <li>To know how to Compare the product (pouch) to the design specification</li> <li>To know how to dentify what went well and suggest / make improvements to the design/ product.</li> </ul>			<ul> <li>To know how my program fits the design criteria and how it would be useful as part of a product (navigation tool)</li> <li>To know how a product has been designed with a developing awareness of sustainability.</li> <li>To know that some key industries utilise 3D CAD modelling and can explain why</li> <li>To know how the product concept fits the client's request and how it will benefit the customers</li> <li>To know that there are key functions in my program, including any additions</li> <li>To know how and explain how my program fits the design criteria and how it would be useful as part of a navigation tool</li> <li>To know how to explain the key functions and features of my navigation tool to the client as part of a product concept pitch</li> <li>To know how to demonstrate a functional program as part of a product concept</li> </ul>
TECHNICAL	<ul> <li>To know that in programming a 'loop' is code that repeats something again and again until stopped</li> <li>To know that a Micro:bit is a pocket-sized, codeable computer</li> <li>To know how to write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</li> </ul>			<ul> <li>To know that accelerometers can detect movement</li> <li>To know that that sensors can be useful in products as they mean the product can function without human input</li> </ul>
ADDITIONAL	<ul> <li>To know how the 'Digital Revolution' has impacted on products changing.</li> <li>To know that in Design and echnology the term 'smart' means a programmed product</li> <li>To know the difference between analogue and digital technologies</li> <li>To understand what is meant by 'Point of Sale Display'</li> <li>To know that CAD stands for Computer-Aided Design</li> </ul>			<ul> <li>To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request</li> <li>To know that 'multifunctional' means an object or product has more than one function</li> <li>To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing</li> </ul>

## -VOCABULARY PROGRESSION OF A PRODUCT DESIGNER-

	TERM 1	TERM 2	TERM 3
FYFS	Structures: Junk Modelling	Textiles: Bookmarks	Structures: Boats
	Join, stick, cut, bend , slot, scissors, measure, materials, fix	Thread, weave, pattern, sew, sewing needle, embroider, design, evaluate	Waterproof, absorb, prediction , variable, experiment, investigation, float, sink, junk
YFAR 1	Structures: Constructing a windmill	Textiles: Puppets	Food: Fruit and vegetables
	Structure, Client, Design, Evaluation, Net, Stable, Strong, Test, Weak, Windmill	Decorate, Design, Fabric, Glue, Model, Hand puppet, Safety pin, Staple, Stencil, Template	Blender, Carton, Fruit, Healthy, Ingredients, Peel, Peeler, Recipe, Slice, Smoothie, Stencil, Template, Vegetable
YFAR 2	Structures: Baby bear's chair	Mechanisms: Fairground Wheel	Mechanisms: Making a moving monster
	Function, Man-made, Mould, Natural, Stable, Stiff, Strong, Structure	Design, wheel, pods, axel holder , design criteria, ferris wheel, axel, frame, mechanism	Input, Lever, Linear motion, Linkage, Mechanical, Mechanism, Motion, Oscillating motion, Output, Pivot, Reciprocating motion, Rotary motion, Survey
YFAR 3	Structures: Constructing a castle	Food: Eating seasonally	Digital world: Electronic charms
	2D shapes, 3D shapes, Castle, Design criteria, Façade, Feature, Flag, Net, Recyclable, Scoring, Stable, Tab	Climate, Dry climate, Exported, Imported, Mediterranean climate, Nationality, Nutrients, Polar climate, Recipe, Seasonal food, Seasons, Temperate climate, Tropical climate	Analogue, Badge, CAD, Control, Design requirements, Develop, Digital, Digital revolution, Digital world, Display, Electronic, Electronic products, Fasten, Function, Initiate, Key features, Layers, Loops, Micro: bit, Monitor, Point of sale, Program, Sense, Simulator, Smart wearables, Stand, Template, User
YFAR 4	Structures: Pavilions	Electrical systems: Torches	Mechanical systems: Making a slingshot car
	Aesthetic, Cladding, Frame structure, Inspiration, Pavilion, Reinforce, Stable, Target audience, Target customer, Texture, Theme	Battery, Bulb, Buzzer, Cell, Component, Conductor, Copper, Electrical item, Electricity, Electronic item, Insulator, Series circuit, Switch, Torch, Wire	Aesthetic, Air resistance, Chassis, Graphics, Kinetic energy
YFAR 5	Mechanical systems: Making a pop-up book	Electrical systems: Doodlers	Food: What could be healthier?
	Computer-aided design (CAD), Caption, Exploded-diagram, Linkage, Mechanism, Pivot, Prototype, Slider	Circuit component, Configuration, Current, Develop, DIY, Investigate, Motor, Motorised, Problem solve, Product analysis, Series circuit	Beef, Cross-contamination, Diet, Ethical issues, Farm, Healthy, Nutrients, Packaging, Reared, Substitute, Supermarket, Vegan, Vegetarian, Welfare
YFAR G	Structures: Playgrounds	Textiles: Waistcoats	Digital world: Navigating the world
	Adapt, Apparatus, Bench hook, Cladding, Coping saw, Dowel, Feedback, Jelutong, Landscape, Mark out, Measure, Modify, Natural materials, Plan view, Playground, Tenon saw	Accurate, Adapt, Fastening, Knot, Properties, Running-stitch, Seam, Sew, Shape, Thread, Unique, Waistcoat, Waterproof	Investment, Lightweight, Materials (wood, metal, plastic etc.), Mouldable, Navigation, Non-recyclable, Product lifecycle, Product lifespan, Smart, Sustainable, Sustainable design, Unsustainable design, Variable, Workplane

#### EYFS F2 DESIGN & TECHNOLOGY SEQUENCING

	TERM 1	TERM 2	TERM 3
	Structures: Junk Modelling CONTEXT	Textiles: Bookmarks CONTEXT	Structures: Making a Boat CONTEXT
	Exploring materials through junk modelling, children develop their scissor skills and awareness of different materials and joining techniques. Children begin to make verbal plans and material choices before starting and problem solve while making their model.	Developing fine motor skills through a range of threading activities before moving on to use binka and a needle. Children design a bookmark, considering what to include and why and then follow their designs to complete their bookmarks.	Children consider the properties of materials through water play, children discover which materials are waterproof and whether they float or sink. Children evaluate a variety of boats and use their new-found knowledge to design and make a boat that is waterproof and floats.
	LQs/ Prompts *Remember that by narrating rather than asking closed questions, such as "What colour is that?", we are more likely to encourage conversation and discussion amongst pupils "Tell me about your model." "I wonder how we could join those two materials together?" "I'm going to use these bottle tops to make wheels for my model."*	LQs/ Prompts *Remember that by narrating rather than asking closed questions, such as "What colour is that?", we are more likely to encourage conversation and discussion amongst pupils "We have to hold our beads steady while we thread them don't we!" "Push the needle through and pull it out the other	*Remember that by narrating rather than asking closed questions, such as "What colour is that?", we are more likely to encourage conversation and discussion amongst pupils "I wonder how we could test that?" "What do you think might happen if we?" "Could you make a prediction about whether this material will be waterproof or not?
FYFQ _	Can you try 'Thumb up. Fingers down! Elbow by your side. Open and shut the blades like a crocodile's mouth' ? I wonder how we could join those two materials together? What could we use to make a door?	side." "I've made a pattern! Blue, red, blue, red, blue, red!" "The ribbon goes over, under, over, underwhat's	"Is it waterproof? How can you tell?" "What do you think might happen if we?" "I wonder what would happen if we took the lid off the bottle? Would it still float?" "Would a ball of tin foil float as well as a flat piece?"
F2	I wonder what you could use to make that string shorter? How could we share out the bottle tops so that we can all use some? What is your favourite part of your model? Why? What is your least favourite part of your model? Why? If you made the same model again, would you want to do anything differently? Which materials did you use to make your model? How did you join 'x' and 'y' together? Which tools did you use to help you make your model? Is your model the same as you planned it to be? If not, why not? Oh look, I can easily take this tower apart. The joins are temporary. Permanent joins mean the materials stay joined forever. Temporary joins mean they can easily be taken apart again	next?" "If we use two or more colours, we can make a repeating pattern. Blue, red, blue, red, blue, red!" "Hold the hessian still with one hand and the needle in the other." "Push the needle through and pull it out the other side. Look, we made a stitch!" "It's ok to find things difficult. We just have to keep trying and trying and each time we'll get a little better." "I can see you concentrating and persevering even when you made a mistake." What are bookmarks? What do you think bookmarks are used for? Do you have a bookmark?	"Would a ball of the foll float as well as a flat piece?" "What might happen if we make the plasticine into a boat shape? I wonder if it would make a difference?" I wonder what that boat is used for?" "Let's think about" "Tell me what you know about boats." wonder which boat floats the best?" "Are all the boats waterproof? How do we know?" "Tell me what you know about boats." "Can you name the different parts of your boat?" "Which is the best waterproof material?" "I wonder how you will join those parts together?" "Can you tell me about your design?"
	When we join these objects together, we can take them apart again.		Let's look carefully at your design" "I wonder how you will join those parts together?" "How can you make sure your boat floats?" "Was your design a success? Would you change anything if you built your boat again?"

F2

# KEY STAGE 1 YR 1 DESIGN & TECHNOLOGY SEQUENCING

# KEY STAGE 1 YR 2 DESIGN & TECHNOLOGY SEQUENCING—

	TERM 1	TERM 2	TERM 3
	Structures: Baby bear's chair	Mechanisms: Fairground Wheel	Mechanisms: Making a moving monster
YEAR 2	CONTEXT_Using the tale of Goldilocks and the Three Bears as inspiration, children help Baby Bear by making him a brand new chair. When designing the chair, they consider his needs and what he likes and explore ways of building it so that it is strong. This unit builds on 'Windmills' in yri LQs What will I include in the design list (criteria)? What is a structure? What are natural and man-made structures? What is meant by stability, strength and stiffness. How do you identify when a structure is more or less stable than another? Which shapes and features of structures make them most stable? How can paper be folded to improve its strength and stiffness when building a structure? How can l create structures and joints from paper, card and tape? What criteria do I need for my structure ge 'Teddy's chair'. How could the structure be improved?	CONTEXT Designing and creating their own Ferris wheels, considering how the different components fit together so that the wheels rotate and the structures stand freely. Pupils select appropriate materials and develop their cutting and joining skills LQs How do different linkage systems produce motion? How do I select materials that have the properties and characteristics needed for the product. Is it important to follow a design brief. How does an evaluation help a designer. How can the product design be adapted and improved? Why is it is important to test my design as I go along? Subject Specific What are the features of a Ferris Wheel ? include the wheel, frame, pods, a base, an axle and an axle holder.	CONTEXT After learning the terms; pivot, lever and linkage, children design a monster which will move using a linkage mechanism. Children practise making linkages of different types and varying the materials they use to bring their monsters to life. LQs How do pivots and levers help different objects move? How do linkages help objects move? Can I produce a design which creates a moving product? How can I assemble my design into a product?

## LOWER KEY STAGE 2

## —DESIGN & TECHNOLOGY SEQUENCING—

	TERM 1	TERM 2	TERM 3
YEAR 3	Structures: Constructing a castle	Food: Eating seasonally	Digital world: Electronic charms
	<b>CONTEXT</b> - Learning about the features of a castle, children design and make one of their own. Using configurations of handmade nets and recycled materials to make towers and turrets and constructing a base to secure them.	<b>CONTEXT</b> - discovering when and where fruits and vegetables are grown. Learning about seasonality in the UK and the relationship between the colour of fruits and vegetables and their health benefits by making three dishes.	<b>CONTEXT</b> -Designing, coding, making and promoting a Micro:bit electronic charm to use in low-light conditions. Children develop their understanding of programming to monitor and control their products.
	Prior Learning: Yr2 Baby Bear's Chair	LQs	LQs
	LQs What are the features of the structure (castle)? What do I include and how do I communicate a design specification ? What would 3D shapes look like if it were opened out flat? How do I construct 3D shapes created from nets? How can I construct the structure ie stack shapes, adorn with facades & decoration and secure the structure to the base? How can I evaluate my product against my design ?	How does the climate affect food growth? What are the advantages of eating seasonal food? How can I make a recipe healthy and nutritious? How do I safely follow a recipe?	How has the digital revolution changed product design? How do I write a program to make an LED flash? Can I create and decorate a pouch to house a Micro:bit? How can I use CAD to design a display?
YEAR 4	Structures: Pavilions         CONTEXT Exploring pavilion structures, children learn about what they are used for and investigate how to create strong and stable structures before designing and creating their own pavilions, complete with cladding.         LQs         What shaped frame structures can be made?         What is the purpose the structure (pavilion)?         What different materials can create different effects.         How can the structure be assembled, made stable, strong and aesthetically pleasing?         How can cladding and textural effects be added to reflect my design?	Electrical systems: Torches CONTEXT Applying their scientific understanding of electrical circuits, children create a torch, designing and evaluating their product against set design criteria. LQs How do electrical items function? What are the features of electrical items? How do I produce a design to fit a specific user's needs? How do I make and objectively evaluate a product?	Mechanical systems: Making a slingshot car CONTEXT - Transforming lollipop sticks, wheels, dowels and straws into a moving car. Using a glue gun to, making a launch mechanism, designing and making the body of the vehicle using nets and assembling these to the chassis. LQs What is a chassis and how are they built? How can a product design reduce air resistance? How do I create a product that is based on my design? How do I assemble and test my finished product?

## LOWER KEY STAGE 2

## —DESIGN & TECHNOLOGY SEQUENCING—

	TERM 1	TERM 2	TERM 3
YEAR 5	Mechanical systems: Making a pop-up book	Electrical systems: Doodlers	Food: What could be healthier?
	<b>CONTEXT</b> - Creating a four-page pop-up storybook design incorporating a range of mechanisms and decorative features, including: structures, levers, sliders, layers and spacers.	<b>CONTEXT</b> -Explore series circuits further and introduce motors. Investigating an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been constructed, ready to develop their own	<b>CONTEXT</b> - Researching and modifying a traditional Bolognese sauce recipe to make it healthier. Children cook their healthier versions, making appropriate packaging and learn about farming cattle.
	How are pop-up books designed?	LQs	LQs
How do I create a p How can layers and Ho do I ensure my f suitable for the end	How do I create a product that is true to a design? How can layers and spacers conceal a mechanism? Ho do I ensure my finished design is high-quality and suitable for the end user?	How are motors used in electrical products? What are the factors that affect the form and function of an existing product? How can I use my findings to develop an improved product? How could I empower another person to assemble my design?	How does food get from farm to fork? What does the term 'healthy' mean in the context of meal preparation? How can a traditional recipe be adapted? How can my knowledge of healthy food be represented in a final product?
YFAP G	Structures: Playgrounds	Textiles: Waistcoats	Digital world: Navigating the world
	<b>CONTEXT</b> –Designing and creating a model of a new playground featuring five apparatus, made from three different structures. Creating a footprint as the base, pupils visualise objects in plan view and get creative with their use of natural features.	<b>CONTEXT</b> - Selecting suitable fabrics, using templates, pinning, decorating and stitching to create a waistcoat for a person or purpose of their choice. <b>LQs</b>	<b>CONTEXT</b> - Programming a navigation tool to produce a multifunctional device for trekkers. Combining 3D objects to form a complete product in CAD 3D modelling software and presenting a pitch to 'sell' their product.
	LQs	How can I use my knowledge of textiles to create a design?	How can I write a design brief and criteria based on a
	What different structure can be found in a playground? What variety of different structures are in your design? How can the range of structures be accurately built? How can apply measuring, marking and cutting wood to build a structure? How can a structure be improved and have detail added? How can a surrounding landscape enhance a product?	Can I mark and cut fabric according to a design? What skills are involved in assembling a waistcoat? How can a fabric product be decorated to enhance its appeal? What different	client request? How can multiple functions be programmed, as part of a navigation device? How can a product concept be made sustainable? What 3D skills are needed to produce a virtual model? What are the features of an effect pitch to 'sell' a product to a client?