Design & Technology

Knowledge Progression

For pupils to develop into confident designers, technicians and innovators they need to become imaginative problem solvers who design and make products for a variety of needs, wants and values. They must acquire a wide range of subject knowledge and draw on mathematical, computing, art and engineering knowledge. The progression plan will inform planning to ensure that learning is built within the lesson sequence, within the topic, within the year and overtime.
As part of our commitment to developing a healthy life-style we want our children to move from being a novice to becoming an expert designer and assertive cook.

The National Curriculum
Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts. When designing and making, pupils should be taught to:

Research & Design	Make	Evaluate	Technical Knowledge	Cooking and Nutrition
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 groups. Generate, develop, designs 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 [for example, cutting, shaping, joining and finishing], 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 [for example, gears, pulleys, cams, levers, and linkages]. Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors]. Apply their understanding of computing to program, monitor and control their products.	As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Area of Study	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Research & Designing	- To Show curiosity about objects. - To use senses to **explore** the world around them. - To talk about what they would like to **make.** **F2** - To make decisions about how to **approach** a task. - To question why things happen and begin to give explanations. - To look at previous designs to support their own designs. **Ideas** **Drawing** **Designs** **Research**	-Know what a **purposeful** product is -Begin to know what makes a product **appealing** -Know the purpose of their product and who their target **audience** is -Know they can develop their design ideas by applying findings from their earlier **research.** **Ideas** **Design** **Research** **Product** **Target audience** **Model** **Materials,** **Purpose** **Construction** **Templates,** **Appealing**	-Know what a **purposeful** product is and why it is **functional** -Know what makes product **appealing** and say why -Use knowledge of existing products to generate designs -Know and describe the purpose of their product, who their target **audience** is -Know that through drawing and labels you can describe how their product will work **Ideas** **Design** **Research** **Label** **Product** **Target audience** **Model** **Materials** **Purpose** **Construction**	**-**Know that **researching** information about the needs and wants of individuals or groups is needed prior to designing -Know how to use **research** to explore the purpose of the product -Indicate design **features** of their products -Know how to generate ideas for a design, that fits a purpose -Know how to use **research** to generate a **criteria** of success for the product -Know how to use **annotation** to communicate design ideas **Ideas** **Research** **Generate**	-Know how to use **research** to indicate design features of a product that will **appeal** to the intended purpose **-**Know how to use **evaluations** of products to identify **criteria** that can be used for their own designs -Know how to make design decisions that take account of the availability of resources and given **criteria** -Know how to annotated designs and uses sketching to support planning --Know how to develop a clear idea of the steps within the product process -Know that designs can be **adapted** during the making process	-Know that products have developed overtime and use this **information** within their designs -Know that ideas from other people can be used within designs -Know and **indicate** the design **features** of their products that will **appeal** to intended users, to include **functions** and why it is **appealing** -Know how to draw a **specification** for their design -Know that original ideas may not work and can be **adapted,** explaining why **Research** **Generate**	-Know that all aspects of a design must lead to the specific need/**purpose.** -Know how to identify and solve design problems -know how to use market **research** to inform designs -Know that ICT can enhance and develop the design **process**. -Know how to Follow and refine original plans, explaining the **rationale** for changes and how these impacts on the final product. -Know how to communicate ideas in a range of ways including photos, detailed sketches, annotated drawings, mock ups, 3D models	-Know how to use research and exploration, such as the study of different cultures, to identify and understand user needs - Know how to develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations -Know how to identify and solve their own design problems and understand how to reformulate problems given to them -Know how to develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations, and computer-based tools

			Templates **Appealing** **Criteria** **Functional**	**Features** **Annotation** **Design criteria** **Functional** **Purposeful** **Successful** **Appeal** **Model** **Pattern** **Methods,** **Decision,** **Availability**	**Ideas** **Research** **Adapt** **Features** **Annotation** **Design criteria** **Functional** **Purposeful** **Appeal** **Methods,** **Proposals** **Sketches** **Cross sectional drawing** **Prototypes** **Innovative** **Evaluations**	-Communicate design ideas in a range of ways **Ideas** **Research** **Generate** **Features** **Appeal** **Users** **Communicate** **Adapted** **Properties** **Alternatives** **Results** **Equipment** **Materials** **Proposals** **Processes** **Methods** **Investigations** **Techniques** **Specification**	**Purpose** **Enhance** **Identify** **Solve** **Process** **Rationale** **Impact** **Communicate** **Product** **Sketches** **Annotations** **Models** **Alternatives** **Equipment** **Materials** **Proposals** **Processes** **Methods** **Investigations** **Techniques** **Specification**	
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Make	- To make a product with a **purpose** in mind - Children to use scissors, glue and card to make their design **F2** - To handle **tools** with increasing control - With support, know which resources and **tools** to choose and explain why **Tools** **Materials** **Build** **Make** **Construct** **Join**	-With support, know which **resources** and **tools** to choose and explain why -Know how to make their design using appropriate **techniques** -With support mark out, cut and shape a range of **materials** Use simple finishing **techniques** to improve the **appearance** of their product - With support know how to use chosen **tools** safely and **hygienically** **Tools** **Materials** **Construct** **Join** **Assemble** **Combine** **Methods** **Resources** **Safely** **Techniques** **Measure** **Cut** **Appearance** **Product** **Sew**	-Know how to select tools and **materials** and explain why -Know which **resources** and **tools** to choose and state reasons for choice -With support, know how to measure, cut and score with some accuracy -Know how to **assemble**, **join** and **combine materials** in order to make a product -Choose and use appropriate finishing **techniques** -Know how to use chosen **tools** safely and **hygienically** with support **Tools** **Materials** **Construct** **Join** **Assemble** **Combine** **Methods** **Resources** **Safely** **Techniques** **Measure** **Cut** **Score** **Appearance** **Product** **Sew**	-Know which tools and **techniques** are suitable for the task and explain their choices **-**Know that all **components** have a **function** -Know how to explain their choice of **materials** and **components** according to **functional properties** and aesthetic qualities -Know how to measure, mark out, cut, score and **assemble components** with increased accuracy -Know they can change things if this helps them improve their work - Use finishing **techniques** to improve the **appearance** of their product -Know and follow **procedures** for safety and hygiene **Components** **Procedures** **Function** **Appearance** **Measure** **Mark out** **Cut** **Score** **Assemble** **Progress** **Equipment** **Safely** **Accurate** **Shape** **Join** **Fabric** **Product**	-Know which **tools** and **equipment** are suitable for the task and explain why they have been chosen -Know that all **components** have a **function** and these may need to be **assembled** in a particular order -Know how to measure, with accuracy, mark out, cut and shape a range of **materials,** using appropriate **tools**, **equipment** and **techniques.** -Know that **adaption** is an acceptable, if it arises -Use finishing **techniques** to improve the strength and **appearance** of their product -Know and follow **procedures** for safety and hygiene **Components** **Procedures** **Function** **Appearance** **Measure** **Mark out** **Cut** **Shape** **Assemble** **Equipment** **Temporary** **Permanent** **Logical,** **Expertise,** **Adapt** **strength** **Sew** **Stitch** **Weave** **Knit**	**-**Know which **tools, equipment** and **techniques** are suitable for the task and understand the importance of accurate use -Explain their choice of **materials** and **components** according to **functional** properties and **aesthetic** qualities -Know to order the stages of the making process, in logical steps. -Begin to **formulate** step-by-step plans as guide to making -Know that accuracy with cutting and joining will ensure a good-quality finish to the product -Explain how **tools** should be used with an understanding of health and safety. Know and explain hygiene **procedures** **Equipment** **Techniques** **Accurate** **Materials** **Components** **Functional** **Aesthetics** **Formulate** **Quality** **Procedures** **Appropriate materials** **Mark out** **Weigh** **Quality** **Perseverance**	-Know the assets and benefits of **tools,** explaining why a specific **tool** has been used. -Confidently use a wide range of **materials** during a project and justify choices based on **aesthetics** and **function** and **purpose** -Know the logical order of the stages of the making process -Know that they must have a **functional** product finished to a quality standard at the end of the making process by accurately **assembling** components -**Formulate** step-by-step plans as guide to making -Know and explain safety and hygiene **procedures** and justify why they are in place **Explain** **Techniques** **Accurate** **Materials** **Aesthetics** **Function** **Purpose** **Logical** **Quality** **Construct** **Assembling** **Components** **Procedures** **Formulate** **Appropriate** **Perseverance** **Modifications**	Know how to select from and use specialist tools, techniques, processes, equipment, and machinery precisely, including computer-aided manufacture -Know how to select from and use a wider, more complex range of materials and components considering their properties. -Explain how a range of tools should be used with an understanding of health and safety. Know and explain hygiene procedures and justify why they are in place.

Evaluate	-To be encouraged to say what they like/dislike about an existing product **F2** - With some guidance know how to explain what they like and dislike about existing products - To begin to **review** how well an approach is going. - Change ideas to make them better. - Be encouraged to talk about why they have made their decisions. **Materials** **Make** **Idea** **Improve** **Better** **Worse** **Change**	- With some guidance know how to explain what they like and dislike about existing products As they work, identify strengths and possible changes they might make to refine their existing design. -Talk about their design ideas and **compare** to their finished product **Materials** **Make** **Improve** **Change** **Product** **Purposeful** **Target audience** **Compare** **Suitable**	-Know how to evaluate existing products through discussions, **comparisons** and simple written evaluations -Know how to evaluate their work against their design **criteria** with support. -Know how to evaluate their products as they are developed, identifying what went well and possible **changes** they might make next time **Materials** **Make** **Improve** **Change** **Evaluate** **Product** **Purposeful** **Target audience** **Compare** **Suitable** **Criteria** **Functional** **Appealing**	-Know how to investigate and analyse existing products and processes against a **criteria** and explain why -Know how to evaluate their work against a specific design **criteria** -Know how to improve work through peer evaluation -Know how well products meet user needs and wants -Consider their design **criteria** as they make progress and be willing to alter their plans, if necessary **Investigate** **Analyse** **Products** **Components** **Design criteria** **Evaluation** **Improve** **User** **Alter** **Features** **Function** **Appealing** **Decision** **Innovative** Existing	- Know how to investigate and analyse existing products (materials/ ingredients) suggest reasons for chosen **characteristics** -Know how to evaluate their work and others against a specific design **criteria,** identifying success and areas for improvement -Know how to evaluate finished products against **existing** key products -Know how well products work and achieve their purposes **Investigate** **Analyse** **Products** **Components** **Design criteria** **Evaluation** **Innovative** **Identify** **Successful** **Improve** **User** **Existing** **Characteristics** **Purposes** **Adapt**	- Know what materials/ ingredients products are made from and suggest **alternatives** -Know how to investigate, analyse and compare existing products -Know how to test, evaluate their work and others against a specific design **criteria** and refine their ideas -Know how to evaluate finished products against existing, key products -Explain why they have made their choices referring to existing products **Alternatives** **Investigate** **Analyse** **Compare** **Existing** **Design criteria** **Aesthetics** **Characteristics** **Properties** **Mechanisms** **Processes** **Methods** **Specification** **Purpose**	-Know what materials/ ingredients products are made from and analyse **alternatives** -Know how to test, evaluate their work and others against a specific design **criteria** and refine their ideas taking into account the intended user or group -Know how to investigate and analyse existing products which are ground breaking and learn about inventors/designers relevant to the project -Know how to evaluate finished products against existing, key products and improve their work justifying what **improvements** they have made and why **Alternatives** **Investigate** **Analyse** **Compare** **Existing** **Design criteria** **Aesthetics** **Characteristics** **Properties** **Processes** **Methods** **Specification** **Purpose** **Inventors** **Designers** **Justify** **Improve**	-Know how to test, **evaluate,** and refine their ideas and products against a specification, considering the views of intended users and other interested groups -Know how to **analyse** the work of past and present professionals and others to develop and broaden their understanding - Know how to **investigate** new and emerging technologies
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Technical Knowledge	- To explore everyday objects and how they work. - To know how everyday objects work by **dismantling** them. **F2** - To learn how to use a range of **tools**, e.g. scissors, hole punch. - To begin to recognise similarities and differences when working with different **materials.** - To talk about why things happen and how they work. **Tools** **Turn** **Materials** **Design** **Fast**	-Know how to use glue, masking tape and a stapler to join fabrics to other fabrics or **materials.** -Know how to cut, shape embellishments and join to a fabric. -Know the characteristics of **materials** affects uses e.g. folding paper to make it stiffer -Know how **mechanisms** can be used in different ways, e.g. joints that allow movement -Know how to use chosen **tools** e.g. scissors and a hole punch -Know how to **assemble,** join and combine	-Know how to use glue, masking tape and a stapler to join fabrics to other fabrics or **materials.** -Know how to cut, shape and join fabric to make a simple product - Know how to join **materials** together in different ways/using different **techniques** -Know how mechanisms can be used in different ways, e.g. wheels and axels -Use knowledge of **materials**, components, constructions kits, making	-Know how to use a simple stitch to join fabrics to other fabrics or **materials** -Know how to tape or pin and join fabric with some accuracy -Know how **materials** can be strengthened to create a structure -Know how winding **mechanisms** can be used to make a product move **Pivot** **Mechanism** **Components** **Construction** **Templates**	-Know how fabric can be combined using different stitching and mixed to create more useful **properties** -Know how to measure, tape or pin, fabric with some accuracy **-**Know how to join and combine **materials** and components. accurately in temporary and permanent ways -Know that diagonal struts can strengthen frames/ structures -Know how electrical circuits, can be	-Know how fabrics and other **materials** can be combined, through sewing and pinning and mixed to create a **purposeful** product -Know how **mechanisms** can be used to make different components move, using a range of equipment -Know how gears and pulleys can be used to speed up, slow down or change direction -Know how to increase the	-Know how fabrics and other **materials** can be combined, through sewing and pinning and mixed to create a **purposeful** product - Know how **mechanisms** can be used to make different components move, using a range of ICT equipment - Know how to combine electrical systems into their product	- Know and understand how more advanced mechanical systems used in their products enable changes in movement and force. -Know and understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] - Know how to apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for

	Slow **Draw** **Glue** **Forwards** **Backwards** **Down** **up**	materials, (including fabric) and components together using a variety of temporary **methods** e.g. glues or masking tape **Tools** **Card** **Masking tape** **Paper** **Fastener** **Join** **Pull** **Push** **Up** **Down** **Straight** **Curve Forwards** **Backwards** **Pivot**	templates, as part of the modelling **process** **Vehicle** **Wheel** **Axle** **Body** **Cab** **Assembling** **Tools** **Stapler** **Fastener** **Straight** **Curve** **Cutting** **Joining** **shaping,** **finishing,** **Pivot** **Mechanism** **Components** **Construction** **Templates**	**Linkage** **System** **Input** **Process** **Output** **Linear** **Rotary** **Oscillating,** **Reciprocating**	used within a product **Properties** **Components** **Circuit** **Fault** **Connection** **Toggle** **Switch** **Battery** **Bulb** **Wire** **Insulator** **Conductor** **Crocodile clip** **Control** **Program** **system** **input** **Output**	strength of structures by combining **materials** and adjusting the frame **Components** **Pulley** **Drive belt** **Gear** **Rotation** **Spindle** **Driver,** **Follower** **Ratio** **Transmit** **Axle** **Motor,** **Circuit** **Annotated** **Mechanical** **system** **Electrical** **system** **Input** **Output**	-Know how to create a moving **mechanism** using electricity -Know how to increase the strength of structures by combining **materials** and adjusting the frame **Components** **Reed switch** **Toggle switch** **Bulb** **Battery** **USB cable wire** **Insulator** **Conductor** **Crocodile clip** **Control** **Program** **System** **Input** **Output** **Series circuit** **Tilt switch** **Parallel circuit** **Dependent** **resistor (LDR)** **Light** **emitting diode** **(LED),**	example, actuators], using programmable components [for example, microcontrollers]
Cooking and Nutrition	- To practise stirring, mixing, and pouring **ingredients.** - To have basic hygiene awareness. **F2** - To understand the importance of healthy food choices. - Know that a healthy balanced diet involves eating at least five portions of fruit and vegetables a day - To have basic hygiene awareness and know how to prepare food safely **Food** **Meal** **Snack** **Healthy diet** **Equipment** **Mix** **Fruit** **Vegetable**	-Know that a healthy balanced diet involves eating at least five portions of fruit and vegetables a day - identify foods within the five food groups -Begin to know that all food comes from plants or animals -With support begin to use **technique**s to peel and cut -Know how to prepare food safely and hygienically without using a heat source **Fruit/vegetable names** **Equipment and utensils** **Soft** **Juicy** **Crunchy** **Sweet** **Sticky** **Smooth** **Sharp** **Crisp** **Sour** **Hard** **Techniques** **Slicing** **Peeling** **Cutting** **Squeezing** **Healthy diet** **Ingredients** **Hygiene**	-Know what makes a balanced diet and know the five food groups -Know where to find the **nutritional** information on packaging and describe the information that should be included on a label -Know that all food comes from plants or animals -Know how to use **techniques** to peel, cut and grate -Know how to prepare food safely and hygienically without using a heat source **Fruit/vegetable names** **Equipment and utensils** **Nutrition** **Soft** **Juicy** **Crunchy** **Sweet** **Sticky** **Smooth** **Sharp** **Crisp** **Sour** **Hard** **Techniques** **Slicing** **Peeling** **Cutting** **Squeezing** **Grating** **Healthy diet** **Ingredients** **Hygiene**	-Know the names of food groups (carbohydrates, protein, dairy, fruits and vegetables, fats, and sugars) -Know and identify the names of fruits and vegetables -Know that fruits are sweet, and vegetables are savoury -Know how to cut and chop raw fruits safely -Know how to grate fruit -Know how to **combine** fruits with a protein to create a healthy drink -Know how to use a knife, grater, blender safely and hygienically **Names of products** **Names of techniques and ingredients** **Raw** **texture** **Taste** **Sweet** **Sour** **Savoury** **Appearance** **Smell** **Fresh** **Hygienic** **Healthy diet** **Preference**	-Know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world -Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in 'The Eat well plate' -Know that to be active and healthy, food and drink are needed to provide **energy** for the body -Know how to use a range of **techniques** to peel chop, slice and grate vegetables -Know how to use a heat source to cook vegetables -Know how to create a vegetable stock -Know how to use a knife, grater, blender, pan safely and hygienically **Names of products** **Names of techniques and ingredients** **Grown** **Reared** **Caught** **Healthy/varied diet**	-Know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world - To begin to understand that **seasons** may affect the food available. - Understand how food is processed into ingredients that can be eaten or used in cooking. - To begin to understand that different food and drink contain different substances – **nutrients**, water and fibre – that are needed for health. - To begin to explain the different food groups on 'The Eat well plate' -Know how to prepare and cook a savoury dish **safely** and **hygienically** including, where appropriate, the use of a heat source. -Start to understand how to use a	-Know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world. - To know that **seasons** may affect the food available. -Understand how food is processed into ingredients that can be eaten or used in cooking. Know different food and drink contain different substances – **nutrients**, water and fibre – that are needed for health. - To explain the different food groups on 'The Eat well plate' -Know how to prepare and cook a savoury dish **safely** and **hygienically** including, where appropriate, the use of a heat source - Understand how to use a range of **techniques** such as peeling, chopping, slicing, grating,	-Know and apply the principles of nutrition and health -Know how to cook a repertoire of predominantly savoury dishes so that they can 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]. -Know and understand the source, seasonality, and characteristics of a broad range of ingredients.

					Energy **Greasy** **Edible** **Moist** **Cook** **Hot** **Spicy** **Frozen** **Processed** **seasonal** **Harvested**	range of **techniques** such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. **Names of products** **Names of techniques and ingredients** **Yeast** **Dough** **Wholemeal** **Carbohydrates** **Fibre** **Nutrients** **Texture** **Weigh** **Savoury** **Shape** **Knead** **Beat** **Roll out** **Rising** **Seasonal** **Utensils** **Combine**	mixing, spreading, kneading and baking. **Names of products** **Names of techniques and ingredients** **Yeast** **Dough** **Wholemeal** **Carbohydrates** **Fibre** **Nutrients** **Texture** **weigh** **savoury** **Unleavened** **Gluten** **seasonal** **Utensils** **Combine** **Rising** **Knead** **Beat** **Roll out** **Shape** **Intolerance**	