DT Progression of Knowledge with Outcomes

Design, make, evaluate and technical knowledge are broken down below the table.

	KNOWLEDGE	OUTCOMES
Year 3	**Mechanical Systems – Levers and Linkages.** • Know what DT stands for. • Know and understand the term 'lever' and 'linkage' • Know the difference between what the lever is and what the linkage is • Understand how the lever and linkage work together • Know that there are different types of lever and linkage systems • Know the purpose of real-life levers and linkages • Understand how different types of levers and linkages work • Know and understand the terms 'input' and 'output' and know which of these is the lever • Know and understand the terms 'fixed pivot' and 'loose pivot' and how these work • Know how to design their own lever and linkage system, understanding how it will move • Know and understand the term 'prototype' and how this will help them in their design process • Know how to design and make their own lever and linkage system in the context of a moving parts page in a book or card (e.g. Christmas card). • Know how to use equipment provided effectively (card, strips of card and split pins) to make a lever and linkage system in order for it to move successfully. • *(Key figure)* To learn about Archimedes who first described the lever. This leads the children onto thinking about levers that they already know of.	**All children:** Understand how a lever and linkage system works. Know how to design, make and evaluate their own simple lever and linkage system. **Most Children:** Understand how different lever and linkage systems work. Know how to design, make and evaluate their own lever and linkage system. **Some children:** Understand and explain how different lever and linkage systems work. Know how to design, make and evaluate a more complex lever and linkage system.
	Shell Structures – Mountain Survivor Pack. • Know what a shell structure is • Know the purpose of different real-life shell structures • Know how the choice of material can affect the shell structure • Know that shell structures can be made stronger • Know different ways in which shell structures can be made stronger • Understand that different materials are more effective in strengthening shell structures • Know the names and properties of basic 3D shapes • Know how a 3D net is used to make a shell structure • Know different 3D nets make different shell structures • Know how to design their own 3D net to make a shell structure • Know how to design a suitable shell structure that is fit for purpose • Know how to use equipment and materials effectively to make a strong and successful shell structure.	**All children:** Understand how a 3D net is used to make a shell structure. Know a way to strengthen a shell structure. Know how to design, make and evaluate their shell structure using a given 3D net. **Most children:** Understand how different 3D nets are used to make different shell structures and know how to make them. Know different ways to strengthen a shell structure. Know how to design, make and evaluate their own shell structure using their own 3D net. **Some children:** Understand how different, more complex 3D nets are used to make different shell structures and know how to make them. Know different ways to strengthen a shell structure and evaluate which method is most effective and why. Know how to design, make and evaluate their own high-quality shell structure using their own 3D net.
	Cooking and Nutrition – Healthy Sandwiches. • Know the different food groups • Know what makes a healthy and varied diet • Know how bread is made and know the difference between different types • Know how to use a range of utensils safely and effectively • Know how to use different utensils for different techniques	**All children:** Know that there are different food groups Know what ingredients are healthy Know which utensils to use to make a healthy sandwich **Most children:** Understand what makes a healthy and varied diet Know how to design a healthy sandwich Know how to use utensils carefully and effectively to make a healthy sandwich

	• Know what healthy ingredients are • Know what makes a healthy sandwich • Know which ingredients to choose to design a healthy sandwich • Know how to use the utensils and ingredients to make a healthy sandwich.	**Some children:** Understand what makes a healthy and varied diet and explain why this is important Identify the different uses of different utensils and use these safely and effectively for different purposes in order to make a healthy sandwich
Year 4	**Textiles – Mittens** • Know that different gloves are made from different materials • Use a range of language to describe different materials • Know that different materials have different purposes • Know how different materials can be fastened together • Know different ways to strengthen, stiffen and reinforce different materials • Know how to thread a needle • Know how to tie a knot at the end of their thread • Know how to safely use a needle when sewing • Know the following stitches: running stitch, back stitch, blanket stitch and over stitch • Know how to create the following stitches: running stitch, back stitch, blanket stitch and over stitch • Know how to create a more complex stitch: cross stitch • Know how to 'cast-off' to secure their thread when they have finished sewing • Know the purpose of different stitches • Know how to overcome problems when sewing • Know how to design their own mittens • Know how to make a prototype out of paper and know why this helps to make the final product • Know how to make their own mittens using sewing. • *(Key figure)* To learn about the history of mittens and the role that Marit Emstad and Abby Condon played in developing them.	**All children:** Use a simple stitch to join fabric together **Most children:** Use an effective stitch to join fabric together **Some children:** Understand that different stitches have different purposes and choose the most appropriate stitch to fasten the fabric together
	Electrical Systems – Robots • Know that a circuit is made up of different components • Know the names of the different components in a simple circuit (light bulb, battery, battery holder, wire) • Know and understand the purpose of each component in a circuit • Know how to make a simple circuit work • Know the different types of switch • Know the purpose of a switch in a circuit and how it works • Know how to make a homemade switch • Know how to design a simple circuit in a 'robot' • Know how to make a simple circuit • Know how to use a cardboard box to make a 'robot' • Know how to evaluate their final product against the success criteria • Know how to use the equipment safely	**All children:** To build a simple circuit with two lightbulbs and a given switch. **Most children:** To build a simple circuit with two light bulbs and a homemade switch. **Some children:** To independently problem solve while making a simple circuit with two light bulbs and an effective homemade switch.
	Cooking and Nutrition – Spanish Wraps • Know the different food groups • Know what makes a healthy and varied diet • Know what healthy ingredients are • Know which foods belong to which food group • Assess their own diets in terms of how healthy and balanced it is • Know what a wrap is • Know the different kinds of wraps available	**All children:** Know how to design a healthy wrap. With support, use the utensils and techniques to make a healthy wrap. **Most children:** Design a healthy wrap based on a success criteria. Do use the utensils and techniques appropriately to make a healthy wrap. **Some children:**

	• Know what Spanish wrap ingredients are • Know how to describe the taste, smell, texture and appearance of different wrap ingredients • Understand basic food hygiene practices • Know the risks involved when handling and preparing food • Know how to use different utensils for different techniques • Know how to use a range of utensils safely and effectively • Understand the purpose of their final product • Know how to design a set of success criteria to follow during the planning process • Know how to write a set of instructions for making a healthy wrap • Know how to design a healthy Spanish wrap • Know how to make a healthy Spanish wrap • Know how to evaluate their final product against the success criteria	To design an appealing looking and tasty, healthy wrap for an event. To independently assess which utensils and techniques should be used to make a healthy wrap and explain their reasons for this.
Year 5	**Cooking and Nutrition – Pizza Making** • Understand how key chefs have influenced eating habits • Understand about seasonality in relation to food products • Understand the source of different food products • Know and use relevant technical and sensory vocabulary • Know how to use different utensils for different techniques • Know how to use equipment including heat sources to prepare and cook food • Know how to measure out, cut, shape and combine different ingredients • Know how to safely conduct the following skills: - grease a baking tray - sift flour into a bowl - rub the butter or margarine into the flour until it resembles fine breadcrumbs - whisk the egg and milk together in a small bowl with a fork - mix to form a soft dough ball - roll out the dough on a floured surface to form a large circle - spread the tomato pizza sauce over the base of the pizza - slice the tomato - peel an onion - arrange the toppings in an appealing way - grate the cheese - sprinkle the grated cheese and herbs on top. • Know that the appearance of the ingredients on a pizza can add to its appeal • Understand the purpose of their final product • Know how to design a set of success criteria to follow during the planning process • Know how to design an appealing pizza • Know how to make an appealing pizza • Know how to evaluate their final product against the success criteria. • (Key figure) To learn about the chef Jamie Oliver and to find out about how he has influenced our healthy eating habits. **Structures – Bird Hides** • Know key events and individuals relevant to frame structures • Know the purpose of a structure • Know what makes a structure effective • Know what materials have been used to create a structure • Know that a structure can be strengthened	**All children:** To know that all food comes from plants or animals To know how to use techniques such as cutting, peeling and grating To know how to prepare simple dishes safely and hygienically **Most children:** To know that food is grown, reared and caught in the UK, Europe and the wider world To know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking To know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source **Some children:** To know how food is processed into ingredients that can be eaten or used in cooking To know that recipes can be adapted to change the appearance, taste, texture and aroma To independently assess which technique is most appropriate to use e.g. peeling, chopping, slicing, grating, mixing, spreading, kneading and baking how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including the use of a heat source **All children:** To begin to understand how to strengthen, stiffen and reinforce 3-D frameworks. To develop a simple design specification.

	• Know different methods for strengthening a structure • Know that some shapes are stronger than others in structures • Know different skills and techniques for accurately joining framework materials together such as paper straws, square sectioned wood • Know the accurate and safe use of tools and equipment such as hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames • Understand the risks involved with using different equipment • Know how to design a set of success criteria to follow during the planning process • Know how to evaluate their final product against the success criteria. • *(Key figure/event)* Know more about the famous landmark and frame structure The Eiffel Tower and how it contributed to the city.	With support, to use tools to measure, mark out, cut, shape and join construction materials to make frameworks (might not be accurate). To use finishing and decorative techniques. **Most children:** To understand how to strengthen, stiffen and reinforce 3-D frameworks To develop a simple design specification to guide the development of their ideas and products. To select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. To use finishing and decorative techniques that are suitable for the product. **Some children:** Understand how to strengthen, stiffen and reinforce 3-D frameworks and do this effectively To develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. To competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. To use finishing and decorative techniques suitable for the product they are designing and making and that are of high quality.
	Mechanical Systems – Fairground Rides • Know that fairground rides work using a mechanical system • Know how different fairground rides work • Know and understand the terms 'input' and 'output' • Know and understand the term 'process' • To know what a pulley is • To know what a motor is • To know how a pulley and a motor work in a circuit • Know how to build a working circuit that incorporates a battery, a motor and a handmade switch • Know the accurate use of tools and equipment including cutting and stripping wire, and making secure electrical connections • Know how to measure, mark, cut, shape and join using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames • Know the accurate and safe use of tools and equipment such as hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames • Know how to design a set of success criteria to follow during the planning process • Know how to evaluate their final product against the success criteria.	**All children:** To understand how a simple pulley system works. With support, know how to design, make and evaluate their own fairground ride with a working circuit. **Most children:** To understand and explain how a simple pulley system works. Know how to design, make and evaluate their own high quality fairground ride with a working circuit. **Some children:** To understand, explain and evaluate different pulley systems. Independently design, make and evaluate their own high-quality fairground ride with a working circuit.
Year 6	**Textiles – Mobile Phone Cases** • Know how to thread a needle • Know how to tie a knot at the end of their thread • Know how to safely use a needle when sewing • Know how to create the following stitches: running stitch, back stitch, blanket stitch, over stitch, cross stitch, chain stitch, cross stitch, stem stitch, satin stitch, lazy daisy stitch.	**All children:** Make a mobile phone case which either does not incorporate both a decorative stitch or a method of fastening. Make a design which is not clearly tailored to suit a particular person.

	• Know how to 'cast-off' to secure their thread when they have finished sewing • Know the purpose of different stitches • Evaluate the ease and success, purpose and strength of each stitch. • Know how to overcome problems when sewing • Know the terms aesthetics, functionality and target market • Know how to create a set of success criteria • Know how to design their phone case for a particular person • Know and evaluate different ways to fasten the fabric • Know how to measure accurately • Know how to cut fabric accurately • Know how to sew on decorations • Know how to design and make their own phone cases • (Key figure) To learn about Mary Brooks Picken who had an influential sewing career. To know her impact on sewing and how she influenced women across the country. **Electrical Systems – Burglar Alarm** • Know how to build a simple circuit • Know how simple switches work • Know different real life examples of different switches • Know the difference between a toggle switch, a push button switch and a pressure switch • Know the needs for different kinds of switches in different alarms • Know the most appropriate materials to use in a pressure switch and why these are appropriate and others are not • Know how to use a computer program to control a circuit that is appropriate for a burglar alarm • Know how to create a set of success criteria • Know how to design their burglar alarm for a particular person and reason • Know the steps to take to make their product successfully • Know how to evaluate their final product against the success criteria • Know how to use the equipment safely	**Most children:** To make a mobile phone case using at least one decorative stitch and fastening which is suited to a particular person. **Some children:** To use a range of decorative stitches and fastening methods to make an original design for a mobile phone case suited to a particular person. **All children:** To build a simple series circuit where a single output device (lightbulb or buzzer) is controlled. **Most children:** To build a series circuit where two output devices (lightbulb and buzzer) are controlled by one switch. **Some children:** To build a parallel circuit where two output devices are controlled independently by two separate switches.

'Design' Knowledge:

Year 3: Know what design criteria is for a product.

Year 4: Know how to develop design criteria for a product.

Year 5: Know how to use research to develop design criteria for a product and specific audience.

Year 6: Know how to use research to develop design criteria for a product and specific audience in order to inform the design of innovative, functional, appealing products that are fit for purpose.

Year 3: Know how to generate, develop and communicate ideas through discussions, annotated sketches and prototypes.

Year 4: Know how to generate, develop and communicate ideas through discussions, annotated sketches, prototypes and pattern pieces.

Year 5: Know how to generate, develop and communicate ideas through discussions, annotated sketches, prototypes and cross-sectional and exploded diagrams.

Year 6: Know how to generate, develop and communicate ideas through discussions, annotated sketches, pattern pieces, prototypes, cross-sectional and exploded diagrams and computer aided design.

'Make' Knowledge:

Know what tools and equipment to choose to perform practical tasks (progression seen in the accuracy of their use).

Know how to choose materials and components based on their function and aesthetic qualities.

'Evaluate' Knowledge:

Know how to investigate and analyse existing products

Know how to evaluate their ideas against own design criteria

Know how to peer evaluate to improve work

'Technical' Knowledge:

Know how key events and individuals in DT shaped the world.

Key Stage 1

When designing and making, pupils should be taught to:

Design:

- 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

Make:

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate:

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria Technical knowledge
- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Cultural Capital Knowledge:

Year 3 –

Mechanical Systems - *(Key figure)* To learn about Archimedes who first described the lever. This leads the children onto thinking about levers that they already know of.

Shell Structures – (*key figure)* To learn about pioneering thin-shell designers Félix Candela Outeriño and Pier Luigi Nervi.

Cooking and Nutrition – (*key figure)* To learn about the origin of the Sandwich and how it was named after the fourth Earl of Sandwich John Montagu.

Year 4 –

Textiles - *(Key figure)* To learn about the history of mittens and the role that Marit Emstad and Abby Condon played in developing them.

Electrical Circuits – (*key figure)* To learn about the Greek mathematician Archytas of Tarentum and how he created the first robot.

(*Key figure)* To learn about Lewis Howard Latimer and how he helped to invent the incandescent light bulb.

Cooking and Nutrition – (*key figure)* To learn about José Andrés, the Spanish chef and how he has contributed positively to the community and wider world through food.

Year 5 –

Cooking and Nutrition - (Key figure) To learn about the chef Jamie Oliver and to find out about how he has influenced our healthy eating habits.

Structures - *(Key figure/event)* Know more about the famous landmark and frame structure The Eiffel Tower and how it contributed to the city. To know about Alexandre Gustave Eiffel and Stephen Sauvestre who contributed to the design and structure.

Gears and Pulleys – (*key figure)* To learn about Fredrick Savage who invented a system for running fairground carousels.

Year 6 –

Textiles - (Key figure) To learn about Mary Brooks Picken who had an influential sewing career. To know her impact on sewing and how she influenced women across the country.

More Complex Electrical Circuits – (*key figure)* To learn about Marie Van Brittan Brown and how she invented the first home security system.