



Design Technology Knowledge, Skills and Vocabulary Routeway

National Curriculum Requirements

End of Key Stage 1

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 [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

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.

Cooking and Nutrition:

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.

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from

End of Key Stage 2

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 [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, children should be taught to:

Design

- 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, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- 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

Evaluate

- 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

Technical Knowledge

- 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.

Cooking and Nutrition

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.

- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.

Year Group	Autumn	Spring	Summer
Reception	<p>On entry: Milestone 3 Creating with materials I can manipulate malleable materials, to create my own patterns and designs. I notice when my work is similar/different to the art of others.</p> <p>Self Regulation I am starting to know that some foods are especially good for me.</p>		
	<p>Structures– Shape Structures and Junk Modelling with a focus on exploring building materials and different ways to join. (knowledge that different materials can be joined to create constructions)</p> <p>Milestone 4 - Creating with materials</p> <ul style="list-style-type: none"> – I can construct a piece, using inspiration from other artists/designers, using my own choice of media and loose parts. 	<p>Structures– Shape Structures and Junk Modelling with a focus on plan and make (knowledge that a plan is an idea for modelling, which is drawn before making. A plan helps the model to be better)</p> <p>Milestone 5 - Creating with materials</p> <ul style="list-style-type: none"> – I can work collaboratively with others to design something I can give meaning to 	<p>Structures– Shape Structures and Junk Modelling with a focus on evaluating and improving own designs and the designs of other children. Challenging children to create a design project for others to complete (Knowledge that it is important to talk about what is good about their own model and what they don't like so that they can improve it next time)</p> <p>Milestone 6 - Creating with materials</p> <ul style="list-style-type: none"> – I sometimes edit and improve my work. – I can construct a collaborative piece with others, planning, discussing and reflecting on our work. <p>ELG: Creating with Materials Children at the expected level of development will:</p> <ul style="list-style-type: none"> • Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form, and function • Share their creations, explaining the process they have used • Make use of props and materials when role playing characters in narratives and stories
	<p>Cooking– Focus on Snack Time/Texture Kitchen/ role play based around the children's interests and different festivals- Harvest, Diwali and Christmas (knowledge that kitchens are where foods are prepared and that kitchens are found in homes, restaurants and cafes. Knowledge that different food items can be prepared and cooked for breakfast, lunch, dinner, puddings and snacks)</p> <p>Milestone 4 – Managing Self</p> <ul style="list-style-type: none"> – I express my food likes/dislikes and I am beginning to understand that some foods are less healthy than others. 	<p>Cooking– Texture Kitchen/ role play (knowledge that people enjoy different foods and eat different foods at different times of the year– a particular focus on Easter and Shrove Tuesday)</p> <p>Milestone 5 – Managing Self</p> <ul style="list-style-type: none"> – I understand the need for variety in my diet and that some foods are less healthy than others but can be eaten in moderation. 	<p>Cooking– Chopping ingredients for the kitchen team– designing recipes for a smoothie</p> <p>Milestone 6 – Managing Self I understand the importance of making healthy food choice in my diet.</p> <p>ELG: Managing Self Children at the expected level of development will:</p> <ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices

	<p>Textiles– Threading with a focus on objects (beads of different shapes and sizes on ribbon, bottle tops on string etc) (Knowledge that with focus, one hand can be used to thread different objects)</p>	<p>Textiles– Threading and weaving with different materials (knowledge that different materials can be used to thread objects. Knowledge that materials can be weaved together)</p>	<p>Textiles– Sewing and weaving patterns with different materials (knowledge that sewing can be completed with ribbon and a plastic needle by moving the ribbon in and out of holes in material)</p> <p>ELG: Creating with Materials Children at the expected level of development will:</p> <ul style="list-style-type: none"> • Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form, and function • Share their creations, explaining the process they have used <ul style="list-style-type: none"> - Make use of props and materials when role playing characters in narratives and stories
Year 1	<p>Coventry, St. John's and Me!</p> <p>Task: Making a Fruit Salad for a picnic in the local grounds and saying what I like about it and why</p> <p><u>National Curriculum - Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • use the basic principles of a healthy and varied diet to prepare dishes (Knowledge of common fruit and vegetables names and that fruit and vegetables are part of a healthy diet. Know that it is important to wash hands before preparing food and that fruit can be prepared in different ways- cutting, peeling, slicing. Knowledge that fruits can be combined to make a new dish with a focus on fruit salad) <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • evaluate their ideas and products- I thing they like about it and why (knowledge that an evaluation helps us to think about what we like about a product.) <p><u>Vocabulary</u> slicing, peeling and slicing, healthy, fruit, vegetables, hygiene</p> <p><u>Additional Skills</u></p> <ul style="list-style-type: none"> - Cutting food safely and accurately - Washing hands before preparing food - Using appropriate preparation surface - Combining ingredients - Cutting fruits safely 	<p>Time Travell</p> <p>Task: Planning and creating a 3D house for a 1966 model City of London for the classroom display and saying what I like about it and why</p> <p><u>National Curriculum- Free standing Structures Design/ Technical knowledge</u></p> <ul style="list-style-type: none"> • design appealing products for themselves (knowledge of what houses looked like during the Fire of London.) • generate and develop their ideas using a given template (knowledge that 2D templates with triangles, squares and rectangles can be used to design 3D models that can stand up by themselves) <p><u>Make</u></p> <ul style="list-style-type: none"> • select from and use a range of tools, materials and equipment (scissors, card, glue) to perform practical tasks (cutting, folding and joining) <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • evaluate their ideas and products- I thing that they like and why (knowledge that an evaluation helps us to think about what we like about a product.) <p><u>Vocabulary</u> cutting, folding, joining, 2D, 3D, triangles, squares, rectangles, scissors, first, next, last, template</p> <p><u>Additional Skills</u></p> <ul style="list-style-type: none"> - Select appropriate techniques explaining: First... Next... Last - Use scissors to cut out accurately 	<p>Exploring the world!</p> <p>Task: Creating an information page for children with a sliding, moving picture and saying what I like and dislike about it and why</p> <p><u>National Curriculum- Mechanisms- sliders on a 2D product Evaluate Existing Designs</u></p> <ul style="list-style-type: none"> • explore and evaluate a range of existing products (Knowledge that some children's books have a moving picture and sliders are mechanisms which enable parts of the picture to move) <p><u>Design/Technical Knowledge</u></p> <ul style="list-style-type: none"> • design purposeful, functional, appealing products for themselves and other users (knowledge that sailing boats have a sail that is moved up and down to steer the boat. Knowledge that books have a purpose.) • explore and use mechanisms (sliders) in their products. (Knowledge that a mechanism allows parts of objects to move. A slider is a type of mechanism) • Communicate their ideas through talking, drawing and templates (knowledge that sliders can work in different directions- up and down and side to side.) • select from a given range of materials (test different materials: card paper, fabric and select a chosen material for the sail of the boat) (Knowledge that different materials have different properties and uses) <p><u>Make</u></p> <ul style="list-style-type: none"> • select from and use a range of tools and equipment (scissors, glue, masking tape) to perform practical tasks (cutting, joining) (knowledge that glue and masking are different equipment for joining and that they can be used for different purposes) <p><u>Evaluate</u></p>

		<p>- Join materials with glue</p>	<ul style="list-style-type: none"> evaluate their product- 1 thing they like and why and 1 thing they don't like and why (knowledge that an evaluation helps us to think about what they like and dislike about a product) Evaluate their idea- Did your chosen material for the sail work? Why? <p>Vocabulary slider, mechanism Additional Skills</p> <ul style="list-style-type: none"> Use pictures and words to convey what they want to design/make Name the tools, equipment and mechanisms they are using Describe what they need to do next Joining materials effectively with masking tape and glue Using scissors to cut accurately
Year 2	<p>Zoom! Soar! Whizz!</p> <p>Task: Designing, making and evaluating a moving car for the Year 2 'Time to Shine' Motofest with parents</p> <p>National Curriculum- Mechanisms (wheels and axles)</p> <p>Evaluate Existing Designs</p> <ul style="list-style-type: none"> explore and evaluate a range of existing products (knowledge that an evaluation helps us to think about what is effective about a product and why. Knowledge of different car designers- with a focus on Henry Ford- who he was and how he designed cars. Knowledge of how cars work, focussing on the movement. Knowledge of how toy cars work by the use of wheels and axles. Knowledge of how an axle joins two wheels to allow movement of the wheels. Knowledge that pushing the cars enable them to move) <p>Design</p> <ul style="list-style-type: none"> explore and use mechanisms (axles and wheels) and materials (junk modelling materials-card, egg boxes, cereal boxes, toilet rolls, yogurt pots, plastic bottles, different sized boxes etc..) design functional products for themselves (knowledge of how combine materials above to design a car which has moving wheels) generate, develop and communicate their ideas through drawing and labelling <p>Make</p> <ul style="list-style-type: none"> select from and use a range of tools and equipment (junior hack saw, scissor, glue, bench hooks) to perform practical tasks (cutting, sticking, joining and finishing) select from and use a wide range of materials and components, (dowelling, cardboard wheels) (Knowledge that a junior hacksaw can be used to cut wood) <p>Evaluate</p> <ul style="list-style-type: none"> - evaluate their ideas and products against design criteria- Does your car move and why? Does your car look like your design picture? What would you improve next time and why? (knowledge that when evaluating a product, it is important to check against design criteria and consider an improvement) 	<p>Saving the world</p> <p>Task: Creating a traditional, healthy Kenyan dish for Prince William on one of his conservation trips</p> <p>National Curriculum- Cooking and Nutrition</p> <p>understand where food comes from (Knowledge of seasonality in Kenya and know how fruits and vegetables are grown. Knowledge that different fruits and vegetables need different weather conditions in order to grow. (Include knowledge that low carbon foods are better for the environment and it is important to buy local produce and seasonal foods- link to climate change!)</p> <ul style="list-style-type: none"> use the basic principles of a healthy and varied diet to prepare dishes (Knowledge of where foods come from around the world (UK- potatoes, Spain- Olives, France- cheese, Kenya- tomatoes). Knowledge that Prince William has tasted traditional Kenyan food on his courageous advocacy missions. Kachumbari is a traditional Kenyan dish made of tomatoes, cucumber, onion, avocado and drops of lemon juice. Knowledge that Kachumbari is a healthy dish with a range of fruits and vegetables. Knowledge that vegetables can be prepared in a variety of ways- (mashing, grating, peeling, dicing)- and that these can alter the eating experience. Children will know how to prepare food safely and that they can create a new dish by combining ingredients.) <p>Evaluate</p> <ul style="list-style-type: none"> Evaluate their product against design criteria- Does your dish look nice? Does it taste nice? How would you improve your preparation of the dish next time? (knowledge that when evaluating a product, it is important to check against design criteria and consider an improvement) <p>Vocabulary Ingredients, seasons, hygiene, safety, combine,</p> <p>Additional Skills</p> <ul style="list-style-type: none"> Measuring amounts of ingredients using non-statutory measures- spoons and cups Preparing food safely and accurately- grating, peeling, dicing and mashing Apply food hygiene learnt from year 1- washing hands before preparing and using appropriate preparation surface 	<p>Happy Holidays</p> <p>Task: Creating a hand puppet for a 'Come and Share' puppet show with parents</p> <p>National Curriculum- Textiles</p> <p>Evaluate Existing designs</p> <ul style="list-style-type: none"> explore and evaluate a range of existing products- How are they used and what are they used for? Focus on similarities and differences and record evaluation in a table- tick or cross (knowledge that there are different types of puppets- hand (Sooty and Sweep, muppets), finger, Marionette (Andy Pandy). Knowledge that these puppets are made differently and achieve different effects when used.) <p>Design/ technical knowledge</p> <ul style="list-style-type: none"> design purposeful, functional, appealing products for themselves and other users based on design criteria (knowledge that seaside puppet shows were a popular form of entertainment in the past and in fact, one famous puppet show (Punch and Judy) was designed by an Italian called Pietro Gimonde. Samuel Pepys watched the first English performance of a well-known puppet show back before the 'Fire of London'. We know this because it was written in his diary. There is also a plaque in Covent Garden, London today. Puppet shows were also a form of entertainment in the 1920's and glove puppetry was increasingly popular) generate, develop and communicate their ideas through paper mock-ups. (knowledge that a mock-up is a model created to test out a design) <p>Make</p> <ul style="list-style-type: none"> select from and use a range of tools and equipment (scissors, glue, thread, needle, template) to perform practical tasks (cutting, sewing, sticking, joining and finishing) select from and use a wide range of materials and components, (textiles) according to their characteristics (Knowledge of how to use a needle and thread to combine materials to make a recognisable puppet- sewing eyes onto the puppet) <p>Evaluate</p>

	<p style="text-align: center;"><u>Vocabulary</u></p> <p>Wheel, axle, movement, dowelling, junior hacksaw, bench hook</p> <p style="text-align: center;"><u>Additional Skills</u></p> <p>-Use a junior hacksaw safely to cut wood -Raising career aspirations through asking questions to a car engineer</p>	<ul style="list-style-type: none"> Using different utensils safely and hygienically to prepare food (knife, chopping board, peeler, grater, spoon, bowl, fork) 	<ul style="list-style-type: none"> When the puppet is created, children to evaluate their ideas and products against design criteria- Does your puppet work as a glove puppet and why? Does it look like your design picture? What would you improve next time and why? After the puppet show, children to consider how effective it was by giving it a number rating. (knowledge that when evaluating a product, it is important to check against design criteria and consider an improvement) <p style="text-align: center;"><u>Vocabulary</u></p> <p>Needle, thread, puppet, button, sew, sewing,</p> <p style="text-align: center;"><u>Additional Skills</u></p> <p>- Threading and using a needle for a running stitch</p>
Year 3	<p style="text-align: center;">Set in Stone!</p> <p><u>Task: Using a basic bread recipe to design and bake a healthy bread with additional ingredients for research for the 'Good Food' magazine</u></p> <p style="text-align: center;"><u>National Curriculum- Cooking and Nutrition</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse a range of existing bread (white, wholemeal seeded, pitta, bagel and fruit bread)- focusing on taste, appearance and ingredients. (knowledge of how fruit and vegetables can be added to recipes with a particular focus on bread. Knowledge that bread was created in the Stone Age but looked and tasted different to modern day bread. Knowledge that Paul Hollywood is a well-known chef in modern day who has designed and created many bread recipes) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques- a focus on baking 2 pieces of bread- 1 plain and 1 with added ingredients (Knowledge of how to combine ingredients to make bread. Knowledge of how bread was cooked in the stone age and how this is different to today and know that the dough needs to rise before being baked.) <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> begin to evaluate their ideas and products against their own design criteria- evaluate both breads created against the following criteria (taste, appearance and ingredients) Children also to evaluate their 'added' ingredient- Does it improve the bread? Why? How has it altered the taste and appearance? (knowledge of how their chosen added ingredient has altered the overall quality of the bread and the reasons why- knowledge of changes in taste and appearance) <p style="text-align: center;"><u>Vocabulary</u></p> <p>Measure ingredients, recipe,</p> <p style="text-align: center;"><u>Additional Skills</u></p> <p>-Evaluate existing types of bread -Measure amounts of ingredients using grams and ml - Follow instructions and recipes</p>	<p style="text-align: center;">Going Global</p> <p><u>Task: Experimenting with mechanisms to design, create and evaluate a simple pulley system for a rain-forest tribe to use in the rainforest</u></p> <p style="text-align: center;"><u>National Curriculum- Mechanisms (Pulleys and Gears)</u></p> <p style="text-align: center;"><u>Evaluate Existing designs</u></p> <ul style="list-style-type: none"> investigate existing products- pulleys in the rain-forest- photos (Knowledge that pulleys are a mechanism which allows heavy objects to be raised. Knowledge that in the rainforest, pulleys may be used to transfer objects across rivers or down from trees. Knowledge of how to combine materials to create a system that has moving parts, including pulleys) Develop an understanding of how key people have helped shape the world in Design and Technology (knowledge that Archimedes of Syracuse was an inventor, engineer and Mathematician who invented the first compound pulley system. It is said he moved an entire warship laden with men using compound pulleys and his own strength) <p style="text-align: center;"><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> generate and develop ideas of how pulleys work through the use of a range of given objects (cotton reel, string, pencils/straws) Observe models of pulleys in the classroom and communicate their ideas through discussion, annotated sketches (children presented with a pulley request from a rain-forest tribe) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (pulleys, string, rope,) understand and use mechanical systems in their products (pulleys) <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products- How effective is your pulley at lifting objects? How could it be more effective? (use of stronger rope and bigger space for carrying objects) Why would a pulley system be more effective for rainforest tribes than using human hands? (Knowledge that pulleys are effective in lifting and moving heavy 	<p style="text-align: center;">Egyptian Discovery</p> <p><u>Task: Designing and making a strong and stiff sarcophagus for an Egyptian Pharaoh and evaluating its effectiveness</u></p> <p style="text-align: center;"><u>National Curriculum- Freestanding Structures</u></p> <p style="text-align: center;"><u>Evaluate Existing designs</u></p> <ul style="list-style-type: none"> Investigate a range of existing products- using photos from museums (knowledge of Sarcophagus', how they were made and what they were made for) and with support, develop a design criteria, with a focus on strength and stiffness <p style="text-align: center;"><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of functional, appealing products that are fit for purpose (Knowledge that wood creates a strong frame). generate through discussion, annotated sketches of their design (knowledge of how to sketch two 3D representations- one to demonstrate the structure of the frame and the triangles to strengthen each part so that it is fit for purpose, and the other to show how the design will be appealing from the outside) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (junior hacksaw, bench hook, rulers, glue) to perform practical tasks (making a frame) select from and use a wider range of materials (wood, cardboard) begin to apply their understanding of how to strengthen, stiffen and reinforce more complex structures (knowledge that cardboard triangles can be used to strengthen structures) <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> Consider the views of others to improve their work- Children to begin to peer assess by considering the cutting, joining and strengthening of their partner's structure during the making process (set questions given!). Children then to make one improvement before continuing with their product. (Knowledge that ongoing evaluation and feedback is as important as a final evaluation as it helps us to make improvements)

	<ul style="list-style-type: none"> - Join and combine a range of ingredients (children to add a further ingredient to the bread recipe) - Evaluate their bread against their planned intention 	<p>items because they reduce the amount of force needed to raise the object)</p> <p><u>Vocabulary</u> pulleys.</p> <p><u>Additional Skills</u></p> <ul style="list-style-type: none"> - Explore and evaluate different ways to create pulleys - Plan the stages of the making process 	<ul style="list-style-type: none"> consider and evaluate the effectiveness of their finished product, using design criteria generated as a class- children to test the strength of their product. <p><u>Vocabulary</u> Junior hacksaw, frame, strengthen, stiffen, structure</p> <p><u>Additional Skills</u></p> <ul style="list-style-type: none"> - Use tools (hacksaw and ruler) with accuracy - Use appropriate finishing techniques - Plan a sequence of actions to make a product - Adjust the making process, taking into account feedback from a friend
Year 4	<p>White Water Adventure</p> <p><u>Task: Design and make a bridge which is strong enough to hold a 1kg weight</u></p> <p><u>National Curriculum- Freestanding Structure</u> <u>Design and technical knowledge</u> <u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and begin to analyse a range of existing products (knowledge that there are different types of bridges with a focus on suspension bridges, arch bridges and beam bridges. These bridges share a similar purpose but are designed with different features for different reasons) <p><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> 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, model and communicate their ideas through discussion and annotated sketches (knowledge of the different parts of bridges- deck, towers, cable, abutment and how make them stronger by adding strengthening struts) understand how key events and individuals in design and technology have helped shape the world (Knowledge that James Finley invented Suspension Bridges in the Western World and that these are effective because they are less rigid meaning they can withstand Earthquakes. They are also incredibly strong due to the steel ropes hung from a tower at each end of the bridge. Isambard Kingdom Brunel used this idea to design suspension bridges in the UK- a famous one being the Clifton Suspension Bridge) <p><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (hammer, nails, junior hacksaw) to perform practical tasks (cutting, joining) accurately select from and use a wider range of materials and components, including wood apply their understanding of how to strengthen, stiffen and reinforce more complex structures (knowledge of how nails and hammers can strengthen structures and that struts can be added to reinforce more complex structures) 	<p>1 minute to Midnight</p> <p><u>Task: Designing and making a fabric shopping bag for themselves</u></p> <p><u>National Curriculum- Textiles</u> <u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and begin to analyse a range of existing products (knowledge that shopping bags can be made with a variety of materials and in a variety of shapes and sizes. Focused analysis on fabric bags and benefits when compare to plastic bags. Knowledge that a variety of stitching techniques can join 2 pieces of material together) <p><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose (knowledge of the different functions and components of a shopping bag. Knowledge of: 1. Fastening variations- velcro, press-stud, button, 2. Shape variations 3. Decoration variations) generate, develop, model and communicate their ideas through discussion, annotated sketches and concrete materials (experimenting with threads, stitches and fabrics) (Building on their knowledge of running stitch in Year 2, children to know how to create a blanket stitch, cross stitch and back stitch to join to materials together. They will know how to use a needle and thread to combine materials and other applique Velcro, buttons, press-studs!) to create a functional bag) <p><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (needles, needle threader and thread) to perform practical tasks (sewing, cutting, threading) accurately select from and use a wider range of materials and components (including fabric, thread, buttons, press-studs, velcro) <p><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Develop an understanding of how key individuals in design and technology have helped shape the world (Knowledge of Lulu Guinness) 	<p>Under Attack</p> <p><u>Task: Designing and making a Roman catapult for a 'Time to Shine' Roman exhibition for parents</u></p> <p><u>National Curriculum – Mechanisms- Levers, wheels, axles</u> <u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and begin to analyse a range of catapults- past and present through photos and practical objects (knowledge that the Romans used catapults as weapons in wars. The catapults had an arm carrying a stone which was pulled down tightly. When released, the arm swung upwards and hurled the stone with great force. Further knowledge that Roman catapults had levers, wheels and axles to enable it to function effectively.) <p><u>Design/technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of functional, products that are fit for purpose generate, develop, model and communicate their ideas through discussion, photos, annotated sketches whilst beginning to explore an exploded diagram (with support) of the lever component (knowledge that exploded diagrams are used to show the parts of the product being designed and how they fit together) <p><u>Make</u></p> <ul style="list-style-type: none"> Select from and use a wider range of tools and equipment (junior hacksaw, glue gun) to perform practical tasks- cutting (sawing), shaping, joining. select from and use a wider range of materials and components, including wood of different shapes and sizes, string, elastic (knowledge that in order for components to work effectively and be fit for purpose, consideration of the size and type of material needs to be well thought out. Knowledge of how to join materials to create a moving mechanism that will be able to launch at a target) <p><u>Evaluate</u></p> <ul style="list-style-type: none"> Develop an understanding of how key events have helped shape the world In Design and Technology- How have the Romans use of catapults contributed to the Romans having a positive impact on our lives today? (knowledge that the use of Roman catapults was)

	<p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria <p style="text-align: center;"><u>Vocabulary</u> Suspension Bridge, Beam Bridge, Arch Bridge, struts, decks, towers, cables, abutment</p> <p style="text-align: center;"><u>Additional Skills</u> Using a hammer and nails</p>	<p style="text-align: center;">(Sainsburys) designs with a focus on fastening, shape and decorations)</p> <p style="text-align: center;"><u>Vocabulary</u> Cross stitch, blanket stitch, running stitch, cross stitch, applique</p> <p style="text-align: center;"><u>Additional Skills</u></p> <ul style="list-style-type: none"> Using different types of stitch- blanket, running, back stitch, cross-stitch) <ul style="list-style-type: none"> How to attach applique to the purse (buttons, zips) Measuring and marking material (chalk) 	<p>one of many contributing factors in the success of Roman Britain (they protected Roman settlements and helped the Romans to invade and settle in new places), contributing towards a positive impact on our lives today)</p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria and consider the views of others to improve their work <p style="text-align: center;"><u>Vocabulary</u> lever, wheels, axles, catapult</p> <p style="text-align: center;"><u>Additional Skills</u></p> <ul style="list-style-type: none"> Apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products (gears, pulleys, levers)
Year 5	<p style="text-align: center;">Back to the dark ages</p> <p>Task: Designing and making a 3D Viking longship toy with a range of mechanisms for Year 2 children</p> <p style="text-align: center;"><u>National Curriculum- Mechanisms (sliders, pulleys, levers) on a 3D product (Viking longship toy)</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse Viking Longships to establish what they look like and how they were used for travel (knowledge that Viking longships were long, sleek and fast to carry the Viking troops up narrow rivers. They had a square sail and symmetrical ends. As they could hold up to 120 men, there were lots of oars. Men sat at rowing benches) <p style="text-align: center;"><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of appealing products that are fit for purpose, a toy aimed at KS1 children. (Children to conduct market research with a sample of KS1 children to check what they like about mechanisms in toys.) understand and use mechanical systems in their products (Children to use this knowledge as well as building on prior knowledge to design a 3D moving toy with a slider, pulley and lever with linkage.) generate, develop, model and communicate their ideas through discussion and with support, exploded diagrams. (Children to use prior knowledge from Year 4 of exploded diagrams- They are used to show the parts of the product being designed, how they fit together and begin to consider the order of assembly. Knowledge of how to create a 3- part exploded diagram (with support) to show the lever, slider and pulley mechanisms). <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (junior safety craft knives, craft cutting mats) to perform practical tasks (measuring, cutting, joining) accurately select from and use a wider range of materials and components including (cardboard, string, pulleys, wood, fabric) <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria 	<p style="text-align: center;">On your marks, get set, go</p> <p>Task: Measuring and combining ingredients to cook a traditional Greek meal and accompanying side dish for a 'Come Dine with me' experience</p> <p style="text-align: center;"><u>National Curriculum- cooking and nutrition</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse a range of food items- A focus on ancient and modern Greek foods. Children to take part in a blind tasting activity to assess the tastes of different foods and whether taste is affected by appearance. (knowledge that the Ancient Greeks ate a variety of delicious dishes, some of which are still around today. Most Greeks were farmers and they ate the food that they grew. Since Greece had a mild climate, they were able to grow many different fruits and vegetables as long as they got enough rain. Among the most common vegetables and plants eaten by Greeks were asparagus, fennel, cucumbers, chickpeas, and celery. Today, Greek cookery makes wide use of vegetables, olive oil, grains, fish, wine, and meat. Other important ingredients include olives, pasta, cheese, lemon juice, herbs, bread, and yogurt. All of these food items have a different taste, appearance and texture. Moussaka is a traditional Greek dish). understand and apply the principles of a healthy and varied diet. As a class, develop an agreed design criteria which the dish will be evaluated against at the end (knowledge that a balanced diet includes suitable proportions of the following: Carbohydrates, fruits and Vegetables, Proteins, Milk and Dairy, high fat/sugar. Children to know how to create a healthy meal and the impact that cooking can have on promoting positive health and wellbeing) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> In small groups, prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques (knowledge of how to create traditional Greek moussaka and a Greek salad. Knowledge of how to combine ingredients to make a healthy new dish and know how and why the meal is part of a balanced diet) understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed (knowledge of foods grown in Greece in comparison with the UK and the reasons for these differences) <p style="text-align: center;"><u>Evaluate</u></p>	<p style="text-align: center;">Building our Future</p> <p>Task: Designing and making a hand held, waterproof torch for use in their fieldtrip to the Peak District</p> <p style="text-align: center;"><u>National Curriculum- Electrical Systems</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse a range of existing products (Re-visit prior knowledge from Year 4- Science that electrical systems are made up of circuits with bulbs, wires, switches and batteries. Know that a switch opens and closes a circuit and that torches work as a result of electrical circuits. Knowledge that torches are created in different shapes and sizes dependent on the user and circuit) Develop an understanding of how key events and individuals in design and technology have helped shape the world- (Knowledge that David Misell invented the flashlight torch in 1896 which has had an impact on our lives today) <p style="text-align: center;"><u>Design/ technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of functional products that are fit for purpose (Knowledge of the need for a handheld, waterproof torch for themselves to use when exploring the Peak District) generate, develop, model and communicate their ideas through discussion, annotated sketches and independently created exploded diagrams (Re-visit prior knowledge of exploded diagrams from Summer Year 4 and Autumn Year 5. When constructing the exploded diagram, children to know how exploded diagrams help the designer know the order of assembly) understand and use electrical systems in their products (series circuits incorporating switches, bulbs, wires and batteries) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (glue gun, scissors) to perform practical tasks (cutting, shaping, joining, finishing), accurately select from and use a wider range of materials and components, including plastic, cardboard, foil, string

	<ul style="list-style-type: none"> Consider the views of others (younger children who took part in the market research) to improve their work, asking them: What do you like about the toy? Why? How could the mechanisms be even better? <p style="text-align: center;"><u>Additional Skills</u></p> <p>Combining a variety of mechanisms- levers, pulleys and sliders</p>	<ul style="list-style-type: none"> Consider the views of others and evaluate a range of the same food to improve their work- In small groups, children to sample each dish and to score them based on the agreed criteria established in the design process. What made the winning dish a success? What would you do differently next time? <p style="text-align: center;"><u>Vocabulary</u></p> <p>Carbohydrates, fruits and Vegetables, Proteins, Milk and Dairy, high fat/sugar, seasonality, balanced diet,</p> <p style="text-align: center;"><u>Additional Skills</u></p> <p>Sort and classify food groups and understanding a balanced diet Measuring amounts of ingredients and using weighing scales accurately Explain how the meal they create is part of a balanced diet Mixing ingredients Using a cooker: selecting settings and using correct timings Storing foods correctly (raw and cooked meat)</p>	<p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria (linked to appearance and functionality) and consider the views of others to improve their work <p style="text-align: center;"><u>Vocabulary</u></p> <p>Battery, bulb, wires, batteries, switch, circuit, crocodile clips</p> <p style="text-align: center;"><u>Additional Skills</u></p> <p>-how to create an electrical circuit for a purpose (position electrical components in order to achieve the intended effect!) -how to join different materials</p>
Year 6	<p style="text-align: center;"><u>Catastrophel</u></p> <p><u>Task: Designing, making and refining a model Earthquake simulator and rescue vehicle with an electrical system (to be presented to the Disasters Emergency Committee DEC)</u></p> <p>National Curriculum- electrical systems- motors and sensors through computer programming- External Provider (Junior Stem) to lead this area of the DT curriculum</p> <p style="text-align: center;"><u>Investigate and Explore</u></p> <ul style="list-style-type: none"> investigate and analyse a range of vehicles used to support natural disasters (Knowledge that following Earthquakes, specialist vehicles support with clearing and re-building structures and that these recovery vehicles are designed based on set criteria for its use) <p style="text-align: center;"><u>Design and technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of innovative, functional products that are fit for purpose, (a disaster recovery vehicle prototype) understand how key events and individuals in design and technology have helped shape the world (Knowledge that William (Bill) Henry Robinson was a New Zealand scientist and seismic engineer who invented the lead rubber bearing seismic isolation device (base isolation) generate, develop, model and communicate their ideas through discussion, prototypes and computer-aided design (knowledge that computer software supports design (CAD) and programming. Children will develop knowledge of how to use an appropriate software to achieve intended outcomes (Lego WeDo) understand and use mechanical systems in their products (gears and pulleys) Understand and use electrical systems in their products (motors and sensors) apply their understanding of computing to program, monitor and control their products (knowledge that computer programming can be used to control the movement of objects) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (iPads, Lego WeDo App) to perform practical tasks (building, combining, joining, testing) select from and use a wider range of materials and components, including Lego, wires, motors, sensors, 	<p style="text-align: center;"><u>Operation: Moonlight Sonata</u></p> <p><u>Task: Designing, making and refining a WW2-style toy for young evacuees</u></p> <p style="text-align: center;"><u>National Curriculum- Mechanisms- CAMS</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse a range of existing products- photos and practical pull-along toys for young children (knowledge that a Cam mechanism is a linkage system which is made up of a Cam, a follower and a frame. The Cams can be different shapes which affects the movement given. Cam mechanisms are used in toys, in particular, pull-along toys.) <p style="text-align: center;"><u>Design and technical knowledge</u></p> <ul style="list-style-type: none"> use research and own develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose (a strong, durable pull along toy for young children) generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional diagrams (Knowledge that a cross-sectional diagram is a diagram which cuts through a product to show the internal mechanisms) understand and use mechanical systems (cams, follower, frame) in their products (knowledge of how to design and make a pull along toy with a cam mechanism) apply their understanding of how to strengthen, stiffen and reinforce more complex structures (Knowledge of how to design and create a free standing structure that will withstand a given test, including how to make this product stronger and efficient for the purpose. Further knowledge that Modroc is a plaster-covered bandage that is used to strengthen and create firm structures.) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools (junior safety craft knives, craft cutting mats) and to perform practical tasks (cutting, joining, finishing) select from and use a wider range of materials and components equipment (cardboard, Modroc, paint), according to their functional properties and aesthetic qualities. <p style="text-align: center;"><u>Evaluate</u></p>	<p style="text-align: center;"><u>I will shine!</u></p> <p><u>Task: Using a range of fabric to design, make and refine a costume accessory for the Year 6 play</u></p> <p style="text-align: center;"><u>National Curriculum- Textiles</u></p> <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> investigate and analyse a range of existing products (knowledge that Sandy Powell is a famous British costume designer who has designed costumes and been nominated for the 'Best Costume Design Academy Award' for many films including Mary Poppins Returns, Cinderella and Hugo) <p style="text-align: center;"><u>Design and technical knowledge</u></p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of innovative, functional, products that are fit for purpose (Knowledge of how to create a unique costume accessory using a range of textiles and sewing techniques. Knowledge that the measuring and dimensions of the product are important in order to meet the purpose) generate, develop, model and communicate their ideas through discussion, annotated sketches, pattern pieces, prototype, templates. (Knowledge that design techniques vary depending on the product- children to use a prototype and to select and use other appropriate design techniques and appropriate stitches) <p style="text-align: center;"><u>Make</u></p> <ul style="list-style-type: none"> select from and use a wider range of tools and equipment (needle, thread) to perform practical tasks (sewing, measuring), accurately select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities (Re-visit knowledge of different stitches from Year 4- cross, running, back and blanket. New knowledge of whip stitch for hemming. Children to use knowledge to select appropriate stitches) <p style="text-align: center;"><u>Evaluate</u></p> <ul style="list-style-type: none"> evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

	<ul style="list-style-type: none"> • apply their understanding of how to strengthen, stiffen and reinforce more complex structures (knowledge of building design strengths in preparation for Earthquake simulator) <u>Evaluate</u> • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work- Children to present their product to the Disasters Emergency Committee for testing and evaluation and to discuss next steps for improvement. <u>Vocabulary</u> wires, motors, sensors, iPads, <u>Additional Skills</u> - Combining materials, and electronics to create a functional machine that would be able to support in a natural disaster. - Using computer technology 	<ul style="list-style-type: none"> • evaluate their ideas and products against their own design criteria. <u>Vocabulary</u> Cam mechanism <u>Additional Skills</u> -Test, evaluate and improve the effectiveness of the strength of a product in relation to the intended user (young children) 	<p><u>Vocabulary</u> cross, running, back and blanket, whipstitch</p> <p><u>Additional Skills</u> -Measure the dimensions of a product accurately to suit the purpose -Use a prototype to test the effectiveness of the product, including its measurements.</p>
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