

Design & Technology



EYFS		
ELG Physical Development	Moving & Handling - Fine motor skills	<ul style="list-style-type: none"> Use a range of small tools, including scissors, paint brushes and cutlery Begin to show accuracy and care when drawing
ELG Expressive Arts & Design	Creating with Materials	<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

Design						
Generation of ideas ** Children will need access to models and construction kits throughout the design process to allow them to alter and amend designs.						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	<p>Design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p>		<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>		<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>	

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Skills	Generate initial ideas and simple design criteria through talking and using own experiences and simple construction kits.	Generate ideas based on simple design criteria and their own experiences, explaining what they could make.	Begin to carry out research into user needs and existing products.	Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user.	Explore a range of initial ideas and make design decisions to develop a final product linked to user and purpose.	Gather information about needs and wants by carrying out research including surveys, interviews and questionnaires
	Develop and communicate ideas through drawing	Develop, model and communicate their ideas through talking, mock ups and drawings	Generate, develop and model innovative ideas through discussion, prototypes and annotated sketches.	Produce annotated sketches, prototypes and final product sketches and pattern pieces.	Generate innovate ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.	Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.
	Use pictures and words to convey what they want to design and make	Explore ideas by experimenting with ideas Model ideas with kits or reclaimed materials describing their models, drawings and intentions	Generate and clarify ideas through discussion with peers and adults to develop design criteria.	(Textiles) Investigate similar products to the one to be made to give starting points for a design	Investigate and begin to evaluate similar products/images to collect ideas.	Investigate and evaluate similar products/images to collect ideas.
	Describe their models and drawings to an adult	Use pictures and words to convey what they want to design and make and how they will make it	Begin to Investigate similar products to the one to be made to give starting points for a design.	Draw/sketch products to help analyse and understand how products are made.	Sketch and model alternative ideas in some detail with annotations	Sketch and model alternative ideas in detail with clear annotations
	Describe what they need to do next		Draw/sketch products to help analyse and understand how products are made	Think ahead about the order of their work and decide upon tools and materials	Begin to develop one idea in depth	Develop one idea in depth
	Model ideas with kits or reclaimed materials to develop an idea orally		Begin to think ahead about the order of their work and decide	Plan a sequence of actions to make a product	Plan the sequence of work beginning to use a storyboard	Combine modelling and drawing to refine ideas
			Record the plan by drawing (labelled sketches) or writing	Begin to record some ideas using annotated cross-sectional diagrams	Plan the sequence of work using a storyboard	
			Develop more than one prototype or adaptation of an initial design			

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			<p>upon tools and materials</p> <p>Begin to plan a sequence of actions to make a product</p>	<p>Propose realistic suggestions as to how they can achieve their design ideas</p> <p>Add notes to drawings to help explanations</p>		<p>Record some ideas using annotated cross-sectional and exploded diagrams</p> <p>Make prototypes & pattern pieces</p> <p>Use a computer to model ideas</p> <p>Draw plans which can be read/followed by someone else</p> <p>Give a report using correct technical vocabulary</p> <p>Produce suitable lists of tools, equipment, materials needed, considering constraints</p>
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Knowledge	Design criteria are the explicit goals that a project must achieve.	Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology	Design criteria are the exact goals a project must achieve to be successful. These criteria might include the product's use, appearance, cost and target user.	Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way.	A pattern piece is a drawing or shape used to guide how to make something. There are many different computer aided design packages for designing products.	Design criteria should cover the intended use of the product, age range targeted and final appearance. Ideas can be communicated in a range of ways, including through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.
Topic / Coverage	Big Lights, Big City Moon zoom Growing	Marvellous Materials Celebrations All around the world	Scrapheap challenge. H2Woah! I do like to be by the seaside.	Epic Empires Cracking the Code All the fun of the fair	To infinity and beyond Circles of Life Bletchley Brainboxes	Survival of the fittest Tempo de fiesta
Vocab	Design Label Design goal Drawings models		Design brief Product Criteria Appearance Target user	Annotated sketches Exploded diagrams		Cross sectional diagrams Prototypes
Cross curricular						
Use of ICT-Design						

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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology		Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design			
Skills	Use digital graphic and text incorporated into final products eg background/moving parts.	Use technology purposeful to create and manipulate digital content.	Design and create digital content on screen, creating nets for their products and combining text with graphics.		Select, use and combine a variety of software to design and create a range of patterns and other content that accomplish given goals, including presenting data and information.	Use search technology for research purposes and be discerning when evaluating digital content.
Knowledge	Computer-aided design is when computers are used to help design products. It has advantages over paper design in that it will show how finished products will look. Different colours and textures can also be trialled.		Computer software can be used to help design or plan a product. Advantages include identifying and solving problems before the product is made and experimenting with different materials and colours. Labels can be added to designs for clarity.		Equipment and devices can be controlled by pressing buttons on a control panel, such as on a washing machine or microwave. Computer monitoring uses sensors as a scientific tool to record information about environmental changes over time. Computer monitoring can also log data from sensors and record the resulting information in a table or graph.	

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Topic / Coverage	Big Lights Big City DT Mechanisms – sliders and levers (POAP)	Marvelous Materials Textiles / Templates & Joining (POAP)	I do Like to Be Beside the Seaside Structures: Shell structures using computer aided design (POAP)		Bletchley Park Textiles-using computer aided design. (POAP)	Survival of the Fittest Mechanical systems-cams (POAP)
Cross curricular	Purple Mash	Purple Mash	Purple Mash	Purple Mash	Purple Mash	Purple Mash
Vocabulary						

	Making					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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NC	<p>Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].</p> <p>Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.</p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</p> <p>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.</p>	<p>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.</p> <p>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.</p>			
Skills	<p>Select and use a range of materials, beginning to explain their choices.</p>	<p>Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect.</p>	<p>Plan which materials will be needed for a task and explain why.</p>	<p>Choose from a range of materials, showing an understanding of their different characteristics.</p>	<p>Select and combine materials with precision</p>	<p>Choose the best materials for a task, showing an understanding of their working characteristics.</p>
knowledge	<p>Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows.</p>	<p>Properties of components and materials determine how they can and cannot be used. For example, plastic is shiny and strong but it can be difficult to paint.</p>	<p>Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost.</p>	<p>Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and</p>	<p>Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques.</p>	<p>It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability.</p>

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				appearances. They look and taste better and are cheaper when in season.		
Topic / Coverage	Moon Zoom Growing	Marvellous Materials Celebrations All around the world	Scrapheap challenge. H2Woah! I do like to be by the seaside.	Epic Empires Cracking the Code All the fun of the fair	To infinity and beyond Circles of Life Bletchley Brainboxes	Survival of the fittest Tempo de fiesta
Cross curricular	Science					
Vocab	Materials Paper Cardboard properties		Physical properties			

	Evaluate					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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National Curriculum	Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria.		Investigate and analyse a range of existing products. Evaluate their ideas and products against their own design criteria.		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.		
	Skills	Talk about their own and each other's work, identifying strengths or weaknesses and offering support.	Explain how closely their finished products meet their design criteria and say what they could do better in the future.	Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account.	Identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements.	Test and evaluate products against a detailed design specification and make adaptations as they develop the product.	Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others.
	Skills	Describe the similarities and differences between two products.	Compare different brands of the same product and explain their similarities and differences.	Explain the similarities and difference between the work of two designers.	Create and complete a comparison table to compare two or more products.	Survey users in a range of focus groups and compare results.	Create a detailed comparative report about two or more products or inventions

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knowledge	A strength is a good quality of a piece of work. A weakness is an area that could be improved	Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned.	Asking questions can help others to evaluate their products, such as asking them whether the selected materials achieved the purpose of the model.	Evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made. Evaluation also includes suggesting improvements and explaining why they should be made.	Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture.	Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it.
knowledge	Two products can be compared by looking at a set of criteria and scoring both products against each one.	Products can be compared by looking at particular characteristics of each and deciding which is better suited to the purpose.	Work from different designers can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market.	A comparison table can be used to compare products by listing specific criteria on which each product can be judged or scored.	A focus group is a small group of people whose reactions and opinions about a product are taken and studied. Evaluations can be made by asking product users a selection of questions to obtain data on how the product has met its design criteria.	Products and inventions can be compared using a range of criteria, such as the impact on society, ease of use, appearance and value for money.
Topic / Coverage	Moon zoom Growing	Marvelous Materials Celebrations All around the world	Scrapheap challenge. H2Woah! I do like to be by the seaside.	Epic Empires Cracking the Code All the fun of the fair	To infinity and beyond Circles of Life Bletchley Brainboxes	Survival of the fittest Tempo de fiesta

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Cross curricular						
Vocab	I like my... because...	My product is..my design because...	It could be improved by...	My friend suggested next time....	My friend suggested next time I ... because...	

Food and nutrition						
Cooking and Nutrition						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	Use the basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from.		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.			

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Skills	<ul style="list-style-type: none"> • Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings. 	<p>Prepare ingredients by peeling, grating, chopping and slicing. Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple, healthy meal. Identify the origin of some common foods (milk, eggs, some meats, common fruit and vegetables)</p>	<ul style="list-style-type: none"> • Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. 	<p>Identify and use a range of cooking techniques to prepare a simple meal. Design a healthy snack or packed lunch and explain why it is healthy. Identify and name foods that are produced in different places in the UK and beyond</p>	<p>Use an increasing range of preparation and cooking techniques to cook a dish. Evaluate meals and consider if they contribute towards a balanced diet Describe what seasonality means and explain some of the reasons why it is beneficial</p>	<p>Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. Plan a healthy weekly diet, justifying why each meal contributes towards a balanced diet. Explain how organic produce is grown</p>
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<p>knowledge</p>	<ul style="list-style-type: none"> • Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell plate. • Know and use technical and sensory vocabulary relevant to the project. 	<p>Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: peeling skins using a vegetable peeler, such as potato skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples. A healthy diet should include meat or fish, starchy foods (such as potatoes or rice), some dairy foods, a small amount of fat and plenty of fruit and vegetables. Food comes from two main sources: animals and plants. Cows provide beef, sheep provide lamb and mutton and pigs provide pork, ham and bacon. Examples of poultry include chickens, geese and turkeys. Examples of fish include cod, salmon and shellfish. Milk comes mainly from cows but also from goats and sheep. Most eggs come from chickens.</p>	<p>There are five main food groups that should be eaten regularly as part of a balanced diet: fruit and vegetables; carbohydrates (potatoes, bread, rice and pasta); proteins (beans, pulses, fish, eggs and meat); dairy and alternatives (milk, cheese and yoghurt) and fats (oils and spreads). Foods high in fat, salt and sugar should only be eaten occasionally as part of a healthy, balanced diet.</p> <ul style="list-style-type: none"> • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately. 	<p>Cooking techniques include boiling. Healthy snacks include fresh or dried fruit and vegetables, nuts and seeds, rice cakes with low-fat cream cheese, homemade popcorn or chopped vegetables with hummus. A healthy packed lunch might include a brown or wholemeal bread sandwich containing eggs, meat, fish or cheese, a piece of fresh fruit, a low-sugar yoghurt, rice cake or popcorn and a drink, such as water or semi-skimmed milk.</p> <p>Particular areas of the world have conditions suited to growing certain crops, such as coffee in Peru and citrus fruits in California in the United States of America</p>	<p>Savoury dishes usually have a salty or spicy flavour rather than a sweet one. A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of foods in the correct proportions. Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper.</p>	<p>Ingredients can usually be bought at supermarkets, but specialist shops may stock different items. Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens usually sell some unusual prepared foods, as well as cold meats and cheeses. Eating a balanced diet is a positive lifestyle choice that should be sustained over time. Food that is high in fat, salt or sugar can still be eaten occasionally as part of a balanced diet. Organic produce is food that has been grown without the use of man-made fertilisers, pesticides, growth regulators or animal feed additives. Organic farmers use crop rotation, animal and plant manures, hand-weeding and biological pest control.</p>
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Vocab	<p>fruit and vegetable names, names of equipment and utensils sensory vocabulary eg. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria</p>	<p>Peel grate Chop slice ingredients. Varied diet healthy meal meat, fish, starchy food, dairy, fat. Origin of food</p>	<p>name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh,</p>	<p>Baking boiling roasting Savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet planning, design criteria, purpose, user, annotated sketch, sensory evaluations</p>	<p>Balanced diet, correct proportions ingredients, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble design specification, innovative, research, evaluate, design brief</p>	<p>yeast, dough, bran, flour, wholemeal, unleavened, baking soda, Recipe Greengrocers Delicatessens justification Organic produce Pesticides fertilisers</p>
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	Technical knowledge					
	Structures					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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National Curriculum	Build structures, exploring how they can be made stronger, stiffer and more stable		Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.			
Skills	Construct simple structures, models or other products using a range of materials. Explore how a structure can be made stronger, stiffer and more stable		Create shell or frame structures using diagonal struts to strengthen them. Build a framework using a range of materials to support mechanism. Select the most appropriate materials and frameworks for different structures, explaining what makes them strong			
Knowledge	Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material		Shell structures are hollow, 3-D structures with a thin outer covering, such as a box. Frame structures are made from thin,			

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than paper. Plastic is light and can float. Clay is heavy and will sink.

rigid components, such as a tent frame. The rigid frame gives the structure shape and support. Diagonal struts can strengthen the structure.

Various methods can be used to support a framework. These include cross braces, guy ropes and diagonal struts.

Frameworks can be built using lolly sticks, skewers and bamboo canes.

Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally.

Triangular shapes can be used instead of square shapes because they are more rigid.

Frameworks can be further strengthened by adding an outer cover.

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Topic / Coverage	Moon zoom Structures: Freestanding Structures (POAP)		I do like to be by the seaside. Structures: Shell Structures using computer-aided design (POAP)			
Cross curricular	Materials-science link					
Vocab	Structure Model Material Purpose properties	stable	Hollow Frame structures rigid	Strengthen Struts jinks	Cross braces Guy ropes Diagonal struts	Corrugated cardboard

	Technical knowledge					
	Electricity					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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National Curriculum	Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors).					
Skills				Incorporate circuits that use a variety of components into models or products.		Use electrical circuits of increasing complexity in their models or products, showing an understanding of control.
knowledge				Components can be added to circuits to achieve a particular goal. These include bulbs for lighthouses and torches, buzzers for burglar alarms and electronic games, motors for fairground rides and motorised vehicles and switches for lights and televisions.		Electrical circuits can be controlled by a simple on/off switch, or by a variable resistor that can adjust the size of the current in the circuit. Real-life examples are a dimmer switch for lights or volume control on a stereo.
Topic coverage				<p>All the fun of the fair Electrical Systems- Simple Circuits and Switches (POAP)</p> <p>Cracking the Code Electrical Systems-Simple Programming and Control (POAP)</p>		<p>Tempo de Fiesta Electrical Systems – Monitoring & Control (POAP)</p>

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Cross curricular				Science-electricity		
Vocab						

	Technical knowledge					
	Mechanical Systems					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	Explore and use mechanisms (for example, levers, sliders, wheels and axles), in their products.		Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)			

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Skills	Explore and use sliders and levers	Explore and use wheels, axles and axle holders.	Explore and use pneumatic systems.			
knowledge	Understand that different mechanisms produce different types of movement. Know and use technical vocab relevant to the project.	Distinguish between fixed and freely moving axles. Know and use technical vocab relevant to the project.	Understand and use pneumatic mechanisms. Know and use technical vocab relevant to the project.		Understand that mechanical and electrical systems have an input, process and an output understand how gears and pulleys can be use to speed up, slow down or change the direction of movement. Know and use technical vocab relevant to the project.	Understand that mechanical and electrical systems have an input, process and an output understand how CAMS can be used to speed up, slow down or change the direction of movement. Know and use technical vocab relevant to the project.
Topic coverage	Big Lights, Big City Mechanisms: Sliders and Levers	All Around the World Mechanisms: Wheels and Axles (POAP)	Scrapheap Challenge Mechanical Systems: Pneumatics (POAP)		Circles of Life Mechanical Systems; Pulleys or Gears (POAP)	Survival of the Fittest Mechanical Systems: CAMS (POAP)
Cross curricular						
Vocab						

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DT sequence of learning-All units will consist of...

Structure of a DT unit	Example linked to year 3 pneumatic systems
1. Investigate real examples	Investigate/know of objects which use pneumatic systems eg balloon pump, bike pump,
2. Disassemble a product	Look at how a pneumatic system works-diagrams
3. Focused practical task linked to final making product.	Show how a pneumatic system works. Children make their own pneumatic systems with tubing and syringes.
4. Design a product matching the design brief.	Design a robot with one moving part.
5. Know about an inventor linked to the topic	Who invented the pneumatic system
6. Make product.	Make robot.
7. Evaluate product against the design brief.	Show case final robots and evaluate how well the product meets the design brief.

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Timings:	Session to cover:
First afternoon	1, 2 and 3.
Second afternoon	4 and 5
Third afternoon	6 and 7