

Design and Technology Knowledge and Skills Progression

'As Designers, we plan, test and create so we can solve relevant problems to meet the needs of ourselves and those around us.'

Plan, test, make, evaluate, improve

Design and Technology



*As Designers, we plan, test and create so we can solve relevant problems to meet the needs of ourselves and those around us.
Plan, test, make, evaluate, improve*



D&T Intent

At Pye Green Academy, children receive a design and technology curriculum which allows them to exercise their creativity through designing and making. The children are taught to combine their designing and making skills with knowledge and understanding in order to design and make a product. Skills are taught progressively to ensure that all children are able to learn and practice in order to develop as they move through the school. Evaluation is an integral part of the design process and allows children to adapt and improve their product, this is a key skill which they need throughout their life. D&T allows children to apply the knowledge and skills learned in other subjects, particularly Maths, Science and Art. Children's interests are captured through theme learning, ensuring that links are made in a cross curricular way, giving children motivation and meaning for their learning. Children will learn basic cooking skills.

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EYFS

At Pye Green, we recognise the fundamental role a child's early years has in shaping the person and learner they become. Our curriculum is designed to build upon the strong foundations set down in our Early Years Foundation Stage. Each curriculum subject takes note of its predecessors in the EYFS, building upon and making links with prior learning.

Art and Design

Pupils have daily access to a Creative Area in the EYFS where activities are carefully planned to allow pupils to learn and explore the foundations of Art and Design in fun and engaging ways. Many of the activities are linked to focus stories and topic themes, but pupils have the freedom to, and are encouraged to, be as creative as they can! Pupils can paint, draw, sculpt and create inside and out learning through teaching and exploratory play.

Development Matters - Expressive Arts and Design

Exploring and Using Media and Materials-

Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Being Imaginative -

Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.

D&T Specific

Constructing: Learning to construct with a purpose in mind, children could use scissors, glue, string and a hole punch to make a bag to store travel brochures they collected during a field trip.

Structure and joins: Following a visit to their local high street, children could make a church tower out of small wooden bricks.

Using a range of tools: Through this, children will learn about planning and adapting initial ideas to make them better. For example, a child might choose to use scissors, a stapler, elastic bands and glue to join bits together to make a toy vehicle. But they might then modify their initial idea by using masking tape.

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Cooking techniques: Children could take turns stirring the mixture for a cake and then watch with fascination as it rises while cooking. They could practise stirring, mixing, pouring and blending ingredients during cookery activities.

Exploration: Children could dismantle things and learn about how everyday objects work. For example, a child might dismantle a pepper grinder and discover how it is put together and the materials different parts are made of.

Discussion: Children could be given opportunities to discuss reasons that make activities safe or unsafe, for example hygiene, electrical awareness, and appropriate use of senses when tasting different flavourings. They could also learn to record their experiences by, for example, drawing, writing and making a tape or model.

NOTE

- Designing does not necessarily entail drawing
- Designing can mean using hand gestures, arranging and re-arranging materials and components, talking and listening
 - Designing is usually intuitive
 - The designing and making process is fluid
- Sometimes practical skills are taught directly
- Children should have frequent opportunities to develop practical skills with a range of materials
 - Children should have frequent opportunities to explore construction kits
 - Children should have frequent opportunities to explore existing products
 - Activities are appropriate to children's prior experience
 - Context is sometimes set by teacher, sometimes by the children

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NC D&T – pupils should be taught to:		Y1	Y2
DESIGN	design purposeful, functional, appealing products for themselves and other users based on design criteria	Year 1 children should: <ul style="list-style-type: none"> • state what products they are designing and making • describe what their products are for • begin to use simple design criteria to help develop their ideas 	Year 2 children should: <ul style="list-style-type: none"> work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • say whether their products are for themselves or other users • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas
	generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	Year 1 children should: <ul style="list-style-type: none"> • generate ideas by drawing on their own experiences • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits. 	Year 2 children should: <ul style="list-style-type: none"> • use knowledge of existing products to help come up with ideas • model ideas by exploring materials, components and construction kits and by making templates and mock- ups • use information and communication technology, where appropriate, to develop and communicate their ideas
	Design Vocab	Design Ideas Names of existing products Purpose	As Y1 plus Evaluate Criteria Functional User Design brief

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	Design – How this is covered	<ul style="list-style-type: none"> Autumn Term – Global Garden. SOW topic - Freestanding Structures Spring Term – .Signed, Sealed, Delivered. SOW topic - Templates and Joining Summer Term – Hot, Hot, Hot. SOW topic - Preparing fruit and Vegetables 	<ul style="list-style-type: none"> Autumn Term – Hi Ho, Hi Ho.. SOW topic – Wheels and axles Spring Term – .A Whole New World. SOW topic - Preparing fruit and Vegetables Summer Term – All at Sea. SOW topic – Sliders and levers
MAKE (including food)	select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Year 1 children should: <ul style="list-style-type: none"> select from a range of tools and equipment. select from a range of materials and components. 	Year 2 children should: <ul style="list-style-type: none"> plan by suggesting what to do next select from a range of tools and equipment, explaining their choices select from a range of materials and components according to their characteristics
	select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	Year 1 children should: <ul style="list-style-type: none"> follow procedures for safety and hygiene with guidance. use a range of materials and components with support. assemble, join and combine materials. use simple finishing techniques, including those from art and design 	Year 2 children should: <ul style="list-style-type: none"> follow procedures for safety and hygiene use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components assemble, join and combine materials and components begin to measure, mark out, cut and shape materials and components begin to use finishing techniques, including those from art and design
	Make – suggested skills	<ul style="list-style-type: none"> Use the senses to explore and talk about materials. Use simple tools and materials with support, Cut paper/card using scissors. Join with tape or glue. Roll paper and card to form a tube. Add paper and card shapes to products. Apply simple finishes e.g. paint, PVA glue glaze. Follow procedures for safety and hygiene. 	<ul style="list-style-type: none"> Explore and talk about the characteristics of an increasing range of materials. Select and use simple tools to cut and join a range of materials. Use a straight edge to mark lines for cutting. Join edge to edge using glue. Curl paper. Use a hole punch and stapler. Select from a range a finish to improve the appearance of a product. Follow procedures for safety and hygiene.

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	Make Vocab	<p>Make</p> <p>Names of tools, equipment and materials</p> <p>Assembling</p> <p>Cutting</p> <p>Joining</p>	<p>As Y1 plus</p> <p>Shaping</p> <p>Finishing</p> <p>Mark out</p> <p>Quality mock up</p>
	Make How it is covered	<ul style="list-style-type: none"> • Autumn Term – Global Garden. SOW topic - Freestanding Structures • Spring Term – .Signed, Sealed, Delivered. SOW topic - Templates and Joining • Summer Term – 	<ul style="list-style-type: none"> • Autumn Term – Hi Ho, Hi Ho.. SOW topic – Wheels and axles • Spring Term – . • Summer Term – All at Sea. SOW topic – Sliders and levers
EVALUATE	explore and evaluate a range of existing products	<p>Year 1 children should explore with guidance:</p> <ul style="list-style-type: none"> • what products are • who products are for • what they like and dislike about products 	<p>Year 2 children should explore:</p> <ul style="list-style-type: none"> • what products are • who products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products
	evaluate their ideas and products against design criteria	<p>Year 1 children should:</p> <ul style="list-style-type: none"> • talk about their design ideas and what they are making • say what they like/dislike about their final product. 	<p>Year 2 children should:</p> <ul style="list-style-type: none"> • make simple judgements about their products and ideas against design criteria • suggest how their products could be improved
	Evaluate Vocab	<p>Evaluate</p> <p>Purpose</p> <p>User</p> <p>functional</p>	<p>As Y1 plus</p> <p>Suitable</p> <p>Design brief</p>

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	<p>Evaluate How it is covered</p>	<ul style="list-style-type: none"> Autumn Term – Global Garden. SOW topic - Freestanding Structures Spring Term – Signed, Sealed, Delivered. SOW topic - Templates and Joining Summer Term – Hot, Hot, Hot. SOW topic - Preparing fruit and Vegetables 	<ul style="list-style-type: none"> Autumn Term – Hi Ho, Hi Ho.. SOW topic – Wheels and axles Spring Term – A Whole New World. SOW topic - Preparing fruit and Vegetables Summer Term – All at Sea. SOW topic – Sliders and levers
TECHNICAL KNOWLEDGE	<p>build structures, exploring how they can be made stronger, stiffer and more stable</p>	<p>Year 1 children should know:</p> <ul style="list-style-type: none"> about the simple working characteristics of materials and components how freestanding structures can be made stronger. the correct technical vocabulary for the projects they are undertaking 	<p>Year 2 children should know:</p> <ul style="list-style-type: none"> about the working characteristics of common materials and components how freestanding structures can be made stronger, stiffer and more stable that a 3-D textiles product can be assembled from two identical fabric shapes the correct technical vocabulary for the projects they are undertaking
	<p>Structures - suggested skills</p>	<ul style="list-style-type: none"> Explore and investigate a range of simple, large scale construction materials, e.g. cardboard boxes. Explore building, bridges and towers using large and small-scale construction materials, e.g. Duplo, cardboard boxes. Make simple 2D structures using straws. 	<ul style="list-style-type: none"> Construct a range of simple structures using simple construction kits. Make a structure more stable by widening the base. Make a square frame from strip wood using triangular card joints. Make a simple card hinge.
	<p>Textiles – suggested skills</p>	<ul style="list-style-type: none"> Explore, sort and group textiles by texture and colour etc. Cut and stick fabrics together. Apply simple finishing techniques, e.g. fabric crayons, gluing on feathers etc. 	<ul style="list-style-type: none"> Talk about and begin to select textiles based on characteristics of an increasing range of materials. Use a simple template. Join fabrics using glue, staples and thread. Apply an increasing range of finishing techniques, e.g. painting and printing.

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	explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	Year 1 children should know: <ul style="list-style-type: none"> • about the movement of simple mechanisms such as levers, sliders, wheels and axles • the correct technical vocabulary for the projects they are undertaking 	Year 2 children should know: <ul style="list-style-type: none"> • about the working characteristics of common materials and components • about the movement of mechanisms such as levers, sliders, wheels and axles • the correct technical vocabulary for the projects they are undertaking 																	
	Axels, pulleys and gears suggested skills	<ul style="list-style-type: none"> • Use junk modelling materials to build boxes. • Use simple construction materials to make a vehicle. • Explore and use construction kits containing gears. 	<ul style="list-style-type: none"> • Deconstruct and reconstruct boxes accurately. • Attach wheels to a chassis using an axle, e.g. cotton reels and dowel. • Use pencils or tubes as rollers to move an object across the floor. 																	
	Mechanisms – suggested skills	<ul style="list-style-type: none"> • Explore and talk about books containing flaps and moving pictures. • Construct a simple slider with support. • Construct a simple lever with support 	<ul style="list-style-type: none"> • Deconstruct a simple slider and describe how it works. • Construct a simple slider independently. • Make a lever by joining card strips with paper fasteners. 																	
	Electrical and Mechanical Components – suggested skills	<ul style="list-style-type: none"> • Use the senses to explore battery powered toys, e.g. cars, trains, tills etc. • Talk about electrical equipment in the home, e.g., kettle, telephone, and microwave. • Explore the use of bulbs, wires and batteries. 	<ul style="list-style-type: none"> • Use remote controlled devices, e.g. a remote controlled vehicle, Bee bot etc • Talk about how common electrical equipment works, e.g., kettle, telephone, and microwave. • Talk about how equipment can be used safely. • Create a simple circuit using a battery, bulb and wires. 																	
	Technical knowledge Vocab	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">vehicle</td> <td style="width: 50%;">joining</td> </tr> <tr> <td>wheel</td> <td>shaping</td> </tr> <tr> <td>axle</td> <td>finishing</td> </tr> <tr> <td>axle holder</td> <td>fixed</td> </tr> <tr> <td>chassis</td> <td>free</td> </tr> <tr> <td>body</td> <td>moving</td> </tr> <tr> <td>cab</td> <td>mechanism</td> </tr> <tr> <td>cutting</td> <td>slider</td> </tr> <tr> <td>mecahnism</td> <td>gears</td> </tr> </table>	vehicle	joining	wheel	shaping	axle	finishing	axle holder	fixed	chassis	free	body	moving	cab	mechanism	cutting	slider	mecahnism	gears
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	<p>Technical Knowledge How it is covered</p>	<ul style="list-style-type: none"> Autumn Term – Global Garden. SOW topic - Freestanding Structures Spring Term – Signed, Sealed, Delivered. SOW topic - Templates and Joining Summer Term – 	<ul style="list-style-type: none"> Autumn Term – Hi Ho, Hi Ho.. SOW topic – Wheels and axles Spring Term – Summer Term – All at Sea. SOW topic – Sliders and levers
COOKING & NUTRITION	<p>use the basic principles of a healthy and varied diet to prepare dishes</p>	<p>Year 1 children should know:</p> <ul style="list-style-type: none"> how to use techniques such as cutting, spreading and peeling. that everyone should eat at least five portions of fruit and vegetables every day begin to prepare simple dishes safely and hygienically, without using a heat source 	<p>Year 2 children should know:</p> <ul style="list-style-type: none"> select to use techniques such as cutting, peeling and grating how to prepare simple dishes safely and hygienically, without using a heat source how to name and sort foods into the five groups in the Eatwell Guide
	<p>understand where food comes from</p>	<p>Year 1 children should know:</p> <ul style="list-style-type: none"> that all food comes from plants or animals 	<p>Year 2 children should know:</p> <ul style="list-style-type: none"> that food has to be farmed, grown elsewhere (e.g. home) or caught
	<p>Food technology – suggested skills</p>	<ul style="list-style-type: none"> Sort fruit and vegetables by taste, shape, size, colour, texture and simple food groups, e.g. meat, vegetables etc. Talk about the changes that take place when food is shaped and mixed. Use basic tools to cut, shape and mix, e.g. cutters and whisks. 	<ul style="list-style-type: none"> Sort and classify food into food groups, e.g. vegetables, pulses, cereals, dairy etc. Talk about what happens when food is heated and cooled Measure and weigh accurately using cups and spoons. Work safely and hygienically.
	<p>Cooking and nutrition Vocab</p>	<p>fruit and vegetable names names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour hard flesh skin seed pip core slicing</p>	<p>peeling cutting squeezing healthy diet choosing ingredients planning investigating tasting arranging popular</p>

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	Cooking and nutrition – How it is covered	<ul style="list-style-type: none">• Autumn Term –• Spring Term –• Summer Term – Hot, Hot, Hot. SOW topic - Preparing fruit and Vegetables	<ul style="list-style-type: none">• Autumn Term –• Spring Term – A Whole New World. SOW topic - Preparing fruit and Vegetables• Summer Term
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NC D&T – pupils should be taught to:		Y3	Y4	Y5	Y6
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	Year 3 children should: <ul style="list-style-type: none"> • work confidently within a range of contexts, such as the home, school, leisure. • describe the purpose of their products • explain how particular parts of their products work 	Year 4 children should: <ul style="list-style-type: none"> • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas 	Year 5 children should: <ul style="list-style-type: none"> • work confidently within a range of contexts, such as culture, enterprise, industry and the wider environment • indicate the design features of their products that will appeal to intended users. 	Year 6 children should: <ul style="list-style-type: none"> • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups
	generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	Year 3 children should: <ul style="list-style-type: none"> • share and clarify ideas through discussion. • use annotated sketches and computer-aided design to develop and communicate their ideas 	Year 4 children should: <ul style="list-style-type: none"> • generate realistic ideas, focusing on the needs of the user • use annotated sketches, cross-sectional drawings and computer-aided design to develop and communicate their ideas 	Year 5 children should: <ul style="list-style-type: none"> • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings, CAD and exploded diagrams to develop and communicate their ideas • make design decisions that take account of the availability of resources 	Year 6 children should: <ul style="list-style-type: none"> • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost

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	<p style="text-align: center;">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>Year 3 children should: :</p> <ul style="list-style-type: none"> • follow procedures for safety and hygiene • select tools and equipment suitable for the task • make their design using appropriate techniques • with help measure, mark out, cut and shape a range of materials • use tools eg scissors and a hole punch safely 	<p>Year 4 children should :</p> <ul style="list-style-type: none"> • explain their choice of materials and components according to functional properties and aesthetic qualities • discuss procedures for safety and hygiene • begin to select tools and materials; and use vocab' to name and describe them • measure, cut and score with some accuracy • use hand tools safely and appropriately • choose and use appropriate finishing techniques 	<p>Year 5 children should::</p> <ul style="list-style-type: none"> • agree procedures for safety and hygiene • measure, mark out, cut and shape materials and components with increasing accuracy • apply a range of finishing techniques, including those from art and design with increasing accuracy • cut and join with accuracy to ensure a good-quality finish to the product 	<p>Year 6 children should: :</p> <ul style="list-style-type: none"> • produce appropriate lists of tools, equipment and materials that they need • formulate step-by-step plans as a guide to making • develop procedures for safety and hygiene • demonstrate resourcefulness when tackling practical problems • use tools safely and accurately • pin, sew and stitch materials together create a product • achieve a quality product
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	<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>Year 3 children should::</p> <ul style="list-style-type: none"> • follow procedures for safety and hygiene • • select materials and components suitable for the task • With help measure, mark out, cut and shape a range of materials • Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape • Use simple finishing techniques to improve the appearance of their product 	<p>Year 4 children should:</p> <ul style="list-style-type: none"> • discuss procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components • assemble, join and combine materials in order to make a product • cut, shape and join fabric to make a simple garment. Use basic sewing techniques • choose and use appropriate finishing techniques 	<p>Year 5 children should::</p> <ul style="list-style-type: none"> • agree procedures for safety and hygiene • measure, mark out, cut and shape materials and components with increasing accuracy • assemble, join and combine materials and components with increasing accuracy • apply a range of finishing techniques, including those from art and design with increasing accuracy 	<p>Year 6 children should :</p> <ul style="list-style-type: none"> • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design, using techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems • assemble components make working models • construct products using permanent joining techniques • make modifications as they go along • pin, sew and stitch materials together create a product
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	Design Vocab	user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces	user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate control, program, system, input device, output device	design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief, annotated sketches, exploded diagrams
	Design – How this is covered	<ul style="list-style-type: none"> • Autumn Term – Time Detective SOW topic – Shell Structures • Spring Term – ·Alive and Kicking. SOW topic - Health and Varied Diet • Summer Term – Work Like an Egyptian SOW topic – 2D shape to 3D Product 	<ul style="list-style-type: none"> • Autumn Term – The Romans are Coming SOW topic – Levers and Linkages • Spring Term – ·A Recipe for Success. SOW topic - Simple circuits and switches • Summer Term – And the Band Played On SOW topic – Pneumatics 	<ul style="list-style-type: none"> • Autumn Term – To Infinity and Beyond SOW topic – Pulleys or Gears • Spring Term – ·Mother Nature’s Recipes. SOW topic - Frame Structures • Summer Term – A Force to be Reckoned with SOW topic – Celebrating culture and Seasonality 	<ul style="list-style-type: none"> • Autumn Term – In Their Footsteps SOW topic – More Complex switches and circuits • Spring Term – ·Facing the Challenge. Cams • Summer Term – London Calling • SOW topic – Combining different fabric shapes / Using CAD in Textiles

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MAKE	Make – suggested skills	<ul style="list-style-type: none"> • Select materials and components according to known characteristics and functions. • Select and use an increasing range of tools to cut, shape and join materials and components. • Use a ruler to measure and mark lines for cutting. • Make and use gluing tabs. • Make simple paper models, mock-ups and templates. • Select an appropriate way to improve the appearance of a product. • Follow procedures for safety and hygiene. 	<ul style="list-style-type: none"> • Select from and use a wide range of materials and components according to both functional and aesthetic qualities. • Select and use tools and equipment to measure, mark out and shape materials and components. • Use a hack saw and bench hook safely. • Insert paper fasteners for card linkages. • Make increasingly complex paper models, mock-ups and templates. • Select the most effective finish to enhance the appearance of a product. • Follow procedures for safety and hygiene 	<ul style="list-style-type: none"> • Select a range of appropriate tools to cut, shape and join materials and components effectively. • Select and use tools and equipment to measure, mark out and shape materials and components accurately. • Use a G clamp effectively. • Join and combine materials and components in permanent and temporary ways. • Make a range of complex paper models, mock-ups and templates. • Produce a well-finished product that fulfils the functional and aesthetic design criteria. • Follow procedures for safety and hygiene. 	<ul style="list-style-type: none"> • Select a range of appropriate tools to cut, shape and join materials and components with accuracy and precision. • Use an increasing range of tools and equipment to measure, mark out and shape materials and components accurately. • Use a drill to make an off-centre hole. • Join and combine a range of materials and components using the most effective permanent and temporary way. • Make and adapt where necessary complex mock-ups and templates. • Identify and apply an appropriate finishing technique to ensure a high quality end product which meeting the design criteria.
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					<ul style="list-style-type: none"> Follow procedures for safety and hygiene.
	Make- Vocab	marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating	components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent	series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart
	Make – How this is covered	<ul style="list-style-type: none"> Autumn Term – Time Detective SOW topic – Shell Structures Spring Term – ·Alive and Kicking. SOW topic - Health and Varied Diet Summer Term – Work Like an Egyptian SOW topic – 2D shape to 3D Product 	<ul style="list-style-type: none"> Autumn Term – The Romans are Coming SOW topic – Levers and Linkages Spring Term – ·A Recipe for Success. SOW topic - Simple circuits and switches Summer Term – And the Band Played On SOW topic – Pneumatics 	<ul style="list-style-type: none"> Autumn Term – To Infinity and Beyond SOW topic – Pulleys or Gears Spring Term – ·Mother Nature’s Recipes. SOW topic - Frame Structures Summer Term – A Force to be Reckoned with SOW topic – Celebrating culture and Seasonality 	<ul style="list-style-type: none"> Autumn Term – In Their Footsteps SOW topic – More Complex switches and circuits Spring Term – ·Facing the Challenge. Cams Summer Term – London Calling SOW topic – Combining different fabric shapes / Using CAD in Textiles

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	investigate and analyse a range of existing products	Year 3 children should investigate and analyse: <ul style="list-style-type: none"> • why materials have been chosen • what methods of construction have been used • how and why products work • if products achieve their purposes 	Year 4 children should investigate and analyse: <ul style="list-style-type: none"> • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused 	Year 5 children should investigate and analyse: <ul style="list-style-type: none"> • how well products have been designed • how well products have been made • how well products meet user needs and wants 	Year 6 children should investigate and analyse: <ul style="list-style-type: none"> • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose
	evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	Year 3 children should:: <ul style="list-style-type: none"> • identify the strengths and areas for development in their ideas and products 	Year 4 children should:: <ul style="list-style-type: none"> • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products 	Year 5 children should:: <ul style="list-style-type: none"> • consider the views of others, including intended users, to improve their work • evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make 	Year 6 children should:: <ul style="list-style-type: none"> • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • evaluate their ideas and products against their original design specification
	understand how key events and individuals in design and technology have helped shape the world	Across KS2 pupils should know: <ul style="list-style-type: none"> • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products 			

Design and Technology Knowledge and Skills Progression

	Evaluate – suggested skills	<ul style="list-style-type: none"> • Investigate and compare a range of similar existing products. • Compare and contrast the similarities and differences of products with the same function. • Evaluate ideas and products against design criteria; and suggest ways in which products can be improved. 	<ul style="list-style-type: none"> • Investigate and begin to analyse a range of existing products. • Use knowledge of similarities and differences between products with the same function to support identification of most effective product. • Evaluate ideas and products against own design criteria, taking into account the views of others. 	<ul style="list-style-type: none"> • Investigate and use analysis of existing products to inform own work. • Identify from a range the key features and functions needed to create an effective and efficient working product. • Give reasons, supported by factual evidence for the success of aspects of a product 	<ul style="list-style-type: none"> • Use analysis of existing products supported by accurate factual information to inform own work. • Test and evaluate products to identify the variants which may affect the function of a product. • Give reasons, supported by factual evidence for the success of aspects of a product and provide considered solutions to resolve those parts that could be improved.
	Evaluate Vocab	font, lettering, text, graphics, decision, evaluating,	user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate	purpose, user, innovation, research, functional	design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

Design and Technology Knowledge and Skills Progression

	<p>Evaluate – How this is covered</p>	<ul style="list-style-type: none"> • Autumn Term – Time Detective SOW topic – Shell Structures • Spring Term – ·Alive and Kicking. SOW topic - Health and Varied Diet • Summer Term – Work Like an Egyptian SOW topic – 2D shape to 3D Product 	<ul style="list-style-type: none"> • Autumn Term – The Romans are Coming SOW topic – Levers and Linkages • Spring Term – ·A Recipe for Success. SOW topic - Simple circuits and switches • Summer Term – And the Band Played On SOW topic – Pneumatics 	<ul style="list-style-type: none"> • Autumn Term – To Infinity and Beyond SOW topic – Pulleys or Gears • Spring Term – ·Mother Nature’s Recipes. SOW topic - Frame Structures • Summer Term – A Force to be Reckoned with SOW topic – Celebrating culture and Seasonality 	<ul style="list-style-type: none"> • Autumn Term – In Their Footsteps SOW topic – More Complex switches and circuits • Spring Term – ·Facing the Challenge. Cams • Summer Term – London Calling • SOW topic – Combining different fabric shapes / Using CAD in Textiles
<p>TECHNICAL KNOWLEDGE</p>	<p>apply their understanding of how to strengthen, stiffen and reinforce more complex structures</p>	<p>Year 3 children should :</p> <ul style="list-style-type: none"> • know how to make strong shell structures • the correct technical vocabulary for the projects they are undertaking 	<p>Year 4 children should • know: how to make strong, stiff shell structures</p>	<p>Year 5 children should • know: that materials can be combined and mixed to create more useful characteristics, such as strength</p>	<p>Year 6 children should :</p> <ul style="list-style-type: none"> • knowhow to reinforce and strengthen a 3D framework

Design and Technology Knowledge and Skills Progression

	<p>Structures – suggested skills</p>	<ul style="list-style-type: none"> • Deconstruct and assemble the net of basic 3D shapes. • Strengthen 2D frames by adding diagonal bracing struts. • Make a rectangular frame from strip wood. • Use materials to make simple joints, glue, tape and paper clips. 	<ul style="list-style-type: none"> • Deconstruct and assemble the net of a range of basic 3D shapes. • Join 2D frames to create 3D structures. • Make rectangular frames of different sizes using strip wood, reinforcing with cross braces. • Use a range of materials to make joints 	<ul style="list-style-type: none"> • Create nets of increasingly complex 3D shapes which include the addition of gluing tabs. • Reinforce and strengthen 3D framework using the concept of 'triangulation'. • Explain in detail why some structures fail. • Use a range of materials to make joints e.g., card strips, elastic bands, thread and ties, and plastic tubing. 	<ul style="list-style-type: none"> • Create nets and templates accurately in a range of sizes. • Use a range of increasingly complex methods to strengthen 3D structures and frames. • Investigate measure and record the load tolerance of different structures and find ways of improving a structures loadbearing capacity. • Build a range of structures using a wide range of effective materials.
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Design and Technology Knowledge and Skills Progression

	<p>Textiles – suggested skills</p>	<ul style="list-style-type: none"> • Talk about the similarities and differences between textiles based on the characteristics of an increasing range of materials. • Use a simple pattern with increasing accuracy. • Cut and join fabrics using running stitch, buttons and bond web. • Decorate fabric by applying beads and sequins 	<ul style="list-style-type: none"> • Give reasons for the selection of fabrics and techniques based on knowledge of characteristics. • Make and use a simple paper pattern. • Join fabrics in a range of different ways using zips, tie clasp, toggles, press-studs and buttons. • Use a wide range of simple finishing techniques. 	<ul style="list-style-type: none"> • Support reasons for selections with justifiable evidence and facts. • Make and use a paper pattern that includes a seam allowance. • Sew using a range of stitches including, backward running stitch and over sewing. • Use a wide range of techniques to add colour, texture and pattern to fabric. 	<ul style="list-style-type: none"> • Select appropriate materials to create a product. • Create increasingly complex patterns and templates with more than one part that are accurately measured. • Use a sewing machine to join and decorate fabric. • Identify the most effective finishing technique in order to maximise the aesthetic value of the product.
	<p>understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</p>	<p>Year 3 children should know :</p> <ul style="list-style-type: none"> • how mechanical systems such as levers and linkages create movement • the correct technical vocabulary for the projects they are undertaking 	<p>Year 4 children should know:</p> <p>how mechanical systems such as levers and linkages or pneumatic systems create movement</p>	<p>Year 5 children should know: how mechanical systems such as cams and pulleys create movement.</p> <ul style="list-style-type: none"> • that mechanical and electrical systems have an input, process and output 	<p>Year 6 children should know:</p> <ul style="list-style-type: none"> • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products

Design and Technology Knowledge and Skills Progression

	<p>Mechanisms – suggested skills</p>	<ul style="list-style-type: none"> • Deconstruct a range of sliders and describe how they work. • Construct increasing complex sliders. • Join levers to make linkages to create moving parts. • Construct a simple pneumatic system with one moving part. 	<ul style="list-style-type: none"> • Deconstruct and reconstruct a range of sliders and levers. • Vary the position of the pivot point to lift a load using a lever. • Construct a pneumatic with two moving parts. • Identify the cam within a simple mechanism and explain how movement is changed. 	<ul style="list-style-type: none"> • Create a range of sliders and levers to produce horizontal and vertical movement. • Combine sliders and levers to produce a range of movements. • Generate questions to investigate and compare the efficiency of pneumatic systems. • Describe the way in which a cam changes rotary motion into linear motion. 	<ul style="list-style-type: none"> • Use a range of technical vocabulary to describe the properties and functions of mechanisms. • Choose and use a range of sliders and levers accurately to create a range of effects. • Analyse and evaluate the efficiency of pneumatic systems. • Discuss the relationship between a cam and follower, an off-centre cam, an off-centre cam, a peg cam, a pear-shaped cam and a snail cam.
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Design and Technology Knowledge and Skills Progression

	<p>Axles, Pulleys and Gears – suggested skills</p>	<ul style="list-style-type: none"> • Construct cubes of different sizes from a net. • With support attach a fixed axle to a chassis and add wheels ensuring that they can move freely. • Construct a simple pulley using rope over a horizontal bar to raise an object off the ground. • Use construction kits with gears to construct a line of gears that turn. 	<ul style="list-style-type: none"> • Construct cuboids of different sizes from a net. • Attach a fixed axle to a chassis and add wheels ensuring that they can move freely. • Construct a pulley that allows a load to travel horizontally along a rope. • Use construction kits with gears to mesh gears at right angles. 	<ul style="list-style-type: none"> • Describe in detail the way in which an axle and chassis help a vehicle to move. • Use a range of different ways to attach an axle to a chassis, e.g. card triangles, drilled holes, cable clips and clothes pegs. • Identify, describe and evaluate products that contain pulleys and drive belts. • Create pulleys and drive systems that can be driven by motor and computer. 	<ul style="list-style-type: none"> • Design and build a working model where the direction of movement can be controlled, e.g. with a chassis with a pivoting axle. • Explain how a belt and pulley system can be used to reverse the direction of rotation, and alter the plane of rotation by 90 degrees. • Explain how the number of teeth of a gear affects the speed of rotation.
	<p>understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p>	<p>Year 3 children should know:</p> <ul style="list-style-type: none"> • how simple electrical circuits and components can be used to create functional products 	<p>Year 4 children should know:</p> <ul style="list-style-type: none"> • how electrical circuits and components can be used to create functional products 	<p>Year 5 children should know:</p> <ul style="list-style-type: none"> • that mechanical and electrical systems have an input, process and output 	<p>Year 6 children should know:</p> <ul style="list-style-type: none"> • how more complex electrical circuits and components can be used to create functional products

Design and Technology Knowledge and Skills Progression

	Electrical and Mechanical Components – suggested skills	<ul style="list-style-type: none"> • Describe how a simple battery powered circuit can be controlled by different kinds of switches. • Talk about simple electrical safety. • Create simple circuits incorporating a battery, bulb, switch, buzzer and wires. 	<ul style="list-style-type: none"> • Explore and describe how an electric motor can be used in a circuit. • Identify key features of electrical safety. • Use a remote-controlled device to switch lights on and off.(including computer control packages) 	<ul style="list-style-type: none"> • Explore and describe how electrical circuits can be created and controlled. • Discuss in depth the hazards and safety issues associated with electricity. • Explore and explain how the direction and speed of an electrical motor can be controlled. • Explore and program a simple control device. 	<ul style="list-style-type: none"> • Explore and describe how switches can be used in a range of circuits to control components, e.g. lights in a lighthouse, a movement sensor in a burglar alarm. • Apply appropriate safety measures when constructing circuits. • Explore and discuss ways in which electricity can be used to control movement. • Explore and use an increasing range of complex control system, e.g., a light sensor.
	apply their understanding of computing to program, monitor and control their products	<p>Year 3 children should know:</p> <ul style="list-style-type: none"> • how simple electrical circuits and components can be controlled using a computer 	<p>Year 4 children should know:</p> <ul style="list-style-type: none"> • how electrical circuits and components can be used to create functional products that can be controlled by a computer 	<p>Year 5 children should know:</p> <ul style="list-style-type: none"> • that mechanical and electrical systems have an input, process and output • how to program a computer to control their products 	<p>Year 6 children should know:</p> <ul style="list-style-type: none"> • how to program a computer to monitor changes in the environment and control their products

Design and Technology Knowledge and Skills Progression

	Technical Knowledge Vocab	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance	pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight, linear, rotary, oscillating, reciprocating, mechanism, lever, linkage, pivot, slot, bridge, guide	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent	cam, snail cam, off-centre cam, peg cam, pear shaped cam, follower, axle, shaft, crank, handle, housing, framework, rotation, rotary motion, oscillating motion, reciprocating motion
	Technical Knowledge – How this is covered	<ul style="list-style-type: none"> • Autumn Term – Time Detective SOW topic – Shell Structures • Spring Term – ·Alive and Kicking. SOW topic - Health and Varied Diet • Summer Term – Work Like an Egyptian SOW topic – 2D shape to 3D Product 	<ul style="list-style-type: none"> • Autumn Term – The Romans are Coming SOW topic – Levers and Linkages • Spring Term – ·A Recipe for Success. SOW topic - Simple circuits and switches • Summer Term – And the Band Played On SOW topic – Pneumatics 	<ul style="list-style-type: none"> • Autumn Term – To Infinity and Beyond SOW topic – Pulleys or Gears • Spring Term – ·Mother Nature’s Recipes. SOW topic - Frame Structures • Summer Term – A Force to be Reckoned with SOW topic – Celebrating culture and Seasonality 	<ul style="list-style-type: none"> • Autumn Term – In Their Footsteps SOW topic – More Complex switches and circuits • Spring Term – ·Facing the Challenge. Cams • Summer Term – London Calling • SOW topic – Combining different fabric shapes / Using CAD in Textiles

Design and Technology Knowledge and Skills Progression

	understand and apply the principles of a healthy and varied diet	Year 3 children should know: • that to be active and healthy, food and drink are needed to provide energy for the body	Year 4 children should know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell Guide	Year 5 children should know: • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health	Year 6 children should know: • • that recipes can be adapted to change the appearance, taste, texture, aroma and healthiness of the finished product.
	prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques	Year 3 children should know: • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, and spreading.	Year 4 children should know: • how to select and use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading.	Year 5 children should know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source •	Year 6 children should know: • how to select the correct techniques to prepare and cook a variety of predominantly healthy savoury dishes safely and hygienically including, where appropriate, the use of a heat source
	understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	Year 3 children should know: • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish)	Year 4 children should know: • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world	Year 5 children should know: • how food is processed into ingredients that can be eaten or used in cooking	Year 6 children should know: • that seasons may affect the food available

Design and Technology Knowledge and Skills Progression

	<p>Food Technology – suggested skills</p>	<ul style="list-style-type: none"> • Sort and classify an increasing range of food according to specific food groups, e.g. proteins, carbohydrates, fats etc. • Talk about what needs to be done in order to work safely and hygienically. • Measure and weigh using standard units and scales. 	<ul style="list-style-type: none"> • Gain an understanding of the ways in which specific food groups apply to the principles of a health and varied diet. • Identify what needs to be done in order to work safely and hygienically when working on a range of tasks. • Convert measure and weigh using standard and imperial units. 	<ul style="list-style-type: none"> • . Talk about and give reasons for the need to work safely and hygienically. • Talk about the impact of changing proportions within a recipe and use knowledge of food and cooking to generate own recipes. • Discuss about the way in which food processing can affect the taste, appearance, texture and colour of food. 	<ul style="list-style-type: none"> • Understand seasonality, know where and how a variety of ingredients are grown, reared, caught and processed • Know and understand the practice needed in terms of food hygiene and kitchen safety. • Talk in scientific terms about the physical and chemical changes that take place when food is cooked, e.g. heated and cooled • Select the appropriate methods and equipment for measuring, e.g. time, dry goods, liquids etc. • Give reasons for the way in which food processing can affect the taste, appearance, texture and colour of food.
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Design and Technology Knowledge and Skills Progression

	Cooking and Nutrition Vocab	<p>texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury</p> <p>hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested</p> <p>healthy/varied diet</p>	<ul style="list-style-type: none"> • 	<p>ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs</p> <p>fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality</p> <p>utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p>	<ul style="list-style-type: none"> •
	Cooking and Nutrition – How this is covered	<ul style="list-style-type: none"> • Autumn Term • Spring Term – Alive and Kicking. SOW topic - Health and Varied Diet • Summer Term – 	<ul style="list-style-type: none"> • Autumn Term • Spring Term • Summer Term – 	<ul style="list-style-type: none"> • Autumn Term – • Spring Term • Summer Term – A Force to be Reckoned with SOW topic – Celebrating culture and Seasonality 	<ul style="list-style-type: none"> • Autumn Term – • Spring Term • Summer Term –