



Malvern Wyche C of E Primary School Design & Technology Education Document

1 Design & Technology Vision

At the Wyche, our motto is 'Together we Soar', based on the verse from Isaiah "they will soar on wings like eagles". In Design & Technology this means that we will develop pupils as designers and technicians, allowing them to discover and acquire their own vision, creativity and technical ability, which will lift their hearts with the joy of making something which has a purpose, but also broaden their horizons, opening the doors to the possibility of providing beautiful, useful and potentially life enhancing products for others in the future, should they choose a role in design and technology in later life. Solving problems, gradually improving a product, working harmoniously with a team, articulating, pitching and presenting a vision and learning gracefully from mistakes are all transferable skills which will allow pupils to soar together in education. Above all it is central to good wellbeing to know that the things we do can make a difference to the lives of others and D&T plays its role as a subject in helping children to flourish.

Design & Technology at The Wyche will:

give pupils a sound understanding of the process of turning an idea, through trial and error, into a product, giving them an understanding of how design and technology works as a process and impacts on the wellbeing of others, by:

1. Equipping pupils with the necessary design & technology knowledge and skills to prepare them for the next stages of education and employment.
2. Deepening understanding of design & technology uses and applications and processes by revisiting learning through a range of cross-curricular contexts (e.g. making moving rainforest toys for younger children or cooking products to sell at a fayre for charity).
3. Building knowledge and understanding of designers, craftspeople and technicians who have impacted for good on the lives of others, including locally (e.g. hand-built cars at the Malvern Morgan Factory, QinetiQ, and a host of web and graphic designers).
4. Developing curiosity and knowledge about the design and manufacture around us, looking closely at the trends and the detail of objects we take for granted.
5. Developing respect for and skill with using tools and processes which are hazardous if the risks are not understood.
6. Developing courageous advocacy and a vision that designing and making things can improve the wellbeing of others and in turn, designers themselves.

1.2 Relevance of Christian Values in design & technology.

<p><i>Safety</i></p> <p>Practical work and manufacturing processes will be risk assessed and pupils will understand the risks and risk reduction measures and abide by these, based on good communication, good supervision and our behaviour policy. We will create a risk-taking classroom environment so that children feel safe to share ideas and make contributions and attempt processes which may be hazardous without risk reduction. Where subjects or topics may be challenging for vulnerable learners we will identify this and offer appropriate support.</p>	<p><i>Trust</i></p> <p>Children will be able to trust that practical work and processes are safe and necessary to learning and that they can trust curriculum-themed trips and visitors; we will gain and repay this trust from parents. Partner and group work will develop trust in others. Children will trust in a risk-taking environment to share views, pitch and present, take feedback and both make, and learn from, useful mistakes. We'll model and praise fairness and truth in self- and peer-evaluation and appropriate safe behaviour in practical work.</p>	<p><i>Respect</i></p> <p>We will be taught and use appropriate and inclusive language when discussing the cultures, and practices of the human beings who share this world. Where we discuss innovations that may meet the need of other people with protected characteristics, we will do this sensitively, remembering that those people are also among us. We will show and learn respect thoughtfully exploring using the most up to date language and showing sensitivity and balance as we explore political, moral and ethical aspects of design and technology.</p>	<p><i>Inspiration</i></p> <p>We will be inspired by educational visits and visitors to make Design & Technology engaging and authentic. We will spend time looking closely at real designed objects, including vehicles, buildings and websites, to gain inspiration. Teaching styles will be well matched to cohorts, to bring design, technology and their real-world processes to life. Curriculum links will deepen, broaden and enhance substantive and disciplinary knowledge to make it memorable. Practical demonstrations and project ideas will be inspirational and engaging and allow children to consider design and technology as a viable and exciting career path.</p>	<p><i>Value</i></p> <p>Pupils will come to value the objects, structures and products that surround them, understanding the degree of care, intelligence and effort which goes into designing and making the things we use every day. We will discover the best designers and manufacturers have a moral purpose to make beautiful, useful products which improve the lives of others, considering how we can offset and reduce the impact of manufacture on the natural world. Pupils will care for equipment and resources, value any feedback and appreciate the adult teaching and support which allows them to succeed.</p>	<p><i>Engagement</i></p> <p>We will take part in practical lessons and manufacturing processes, overcoming caution or reluctance to get the full benefit of what is being provided, working safely out of comfort zone, in the place where learning lifts off. We will work to overcome fear of failure (and taste things we think we don't like). We'll understand that engagement in Design & Technology is an ethical and matter and begin to understand the opportunities in Design & Technology to serve others, as well as make a living, and improve the lives of others as we'll as the look, and function of the world around us. We will engage in our own community charitably, and as entrepreneurs.</p>
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Pupils in KS2 design soft toys to comfort children being evacuated.

2 Design & Technology Curriculum

Science Long Term Plan EYFS & KS1 National Curriculum ((Hedgehog & Fox Class)


Reception, Year 1 & Year 2


Year A

Term	Substantive Knowledge: "I know that" (<i>What we are learning about</i>)	Disciplinary Knowledge "I know how to" (<i>What we are learning that designers & manufacturers do.</i>) [<i>See D&T progression of skills for age-appropriate descriptors.</i>]
Aut	<p>Full of Beans [Cooking: nutrition and recipe design]</p> <ul style="list-style-type: none"> Beans and pulses are part of a healthy diet. We wash our hands before cooking to make sure we don't pit dirt or germs in the food. When we use knives to chop and cut we take care and keep fingers away from the blade. Beans and pulses grow above the ground on tall plants. They are picked and preserved in tins and packets. Some foods are <u>processed</u> and may have lots of extra ingredients than just the beans and pulses - we need to be aware of what we are eating and cooking with (levels of salt, sugar, fat). 	<p>D1 Design & Plan Design an appetising combination of beans and other savoury ingredients which looks good and tastes good, based on a consumer survey. Show intentions in a plan using labelled diagrams, listing ingredients and showing method and utensils.</p> <p>D2 Make & Manufacture Select and use appropriate equipment (spoon, vegetable knife grater) Select and combine own choices of ingredients, ensuring hygienic practices, safe use and good presentation.</p> <p>D3 Evaluate & Improve Explore and evaluate ingredients for health, appearance and flavour and try bean salads to decide on own approach. Evaluate their ideas and products against design criteria and use feedback to suggest improvements.</p> <p>D4 Use & Apply Use tin openers, spoons and knives safely and tidily to process and combine raw ingredients.</p> <p>D5 Cooking & Nutrition Read the labels of tins and packets to check the added ingredients and explore the health benefits of beans and pulses.</p> 
Spr	<p>African Bags [Textiles]</p> <ul style="list-style-type: none"> People use bags to carry things they need and fasteners make them secure. Designers choose the shape, pattern and fabric of bags, as well as the clasp. An African print may appeal to people from Africa, or people who have visited or would like to visit. Fabric is harder to cut than paper and you need sharp scissors and a clear line to cut. When we use scissors and glue, we take care and keep fingers away from the blades and wash glue off our hands and keep it away from mouth and eyes. 	 <p>D1 Design & Plan Design purposeful, functional, bags which are attractive, fasten and carry objects. Plan the product stating which materials and patterns will be used, how it will fasten, what methods will be used, and a mock-up of the finished product.</p> <p>D2 Make & Manufacture Select and use appropriate tools and equipment (pencil, ruler, scissors and glue) to manufacture and finish the bag. Make an informed choice about materials (fabric) based on the design brief.</p> <p>D3 Evaluate & Improve Explore and evaluate a range of bags which fasten. Evaluate their ideas and products against design criteria and take feedback from peers and adults.</p> <p>D4 Use & Apply Use scissors to cut, first drawing a straight guideline and glue to join, finishing neatly and attractively.</p>
Sum	<p>Drawbridges [Mechanisms: Pulleys]</p> <ul style="list-style-type: none"> Designers select materials to be stiff and strong to support weight and stand up. We are using cardboard, string and wood, but real houses and castles are made of brick, wood, glass and metal. People who design houses are called architects and people who make them are called builders. A pulley is a mechanism that uses string and a hinge to raise and lower an object. 	<p>D1 Design & Plan Design purposeful, functional, appealing drawbridges for "the king and queen" design criteria. Generate, develop, model and communicate their ideas through talking, drawing, and a labelled diagram.</p> <p>D2 Make & Manufacture Select from and use a range of tools and equipment to cut and join cardboard, wood and string (scissors, string and tying knots) Select from and use a wide range of materials and components, including dowel, string, wool, thread, paper, thin and thick card.</p> <p>D3 Evaluate & Improve Explore and evaluate a range of hinges, pulleys and door mechanisms, including those which use string. Evaluate their drawbridges against a</p> <p>D4 Use & Apply Build structures, exploring how they can be made stronger, stiffer and more stable. Explore and use pulleys to raise and lower a drawbridge.</p> 


Year B


Term	Substantive Knowledge: "I know that" (<i>What we are learning about</i>)	Disciplinary Knowledge "I know how to" (<i>What we are learning that scientists do.</i>) [See <i>Science progression of skills</i> for age-appropriate descriptors.]
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Aut	 <p><u>Moving Pictures</u> <u>[Mechanisms: sliders, levers and pivots]</u></p> <ul style="list-style-type: none"> • Some books have moving pictures to entertain the reader • They use slides and pins to make bits of the picture moveable • Split pins are bent back to keep them in the paper • Pop-up books use moving pictures • The design specification helps me evaluate if I have done a good job. • A "questionnaire" is a list of questions which ask people what they like or don't like. 	
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		<p>D1 Design & Plan Design a moving picture indicating what will move and how based on design criteria from market research • Communicate their ideas through talking and mock-ups.</p> <p>D2 Make & Manufacture Safely uses scissors, piercing tools and push-pins to construct pop up books.</p> <p>D3 Evaluate & Improve Explore and evaluate a range of pop-up books • Evaluate their ideas and products against design criteria.</p> <p>D4 Use & Apply 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.</p> 
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Spr	<p><u>T-shirt design</u> <u>[Textiles]</u></p> <p>Children will explore and engage with fashion design and then design, safely decorate and evaluate their own T-shirt, expressing their learning about 20th Century pop culture. They will develop skills to cut and colour fabric and evaluate the difference between paper, card and textiles.</p> <ul style="list-style-type: none"> • Design ideas come from researching products and asking people what they like. • Pop culture developed through the 1950's, 60's 70's and 80's • All the clothes we wear are created by designers and made by manufacturers • Clothing design is called "textiles". • There are different techniques of embellishment and what these look like. • There are different tools for costume makers to use, like sewing machines. 	
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		<p>D1 Design & Plan use existing products to identify a purpose. Design purposeful, functional, appealing products for themselves and other users based on design criteria. Generate, develop, model and communicate their t-shirt designs through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.</p> <p>D2 Make & Manufacture use scissors safely to cut fabric. embellish a design according to the characteristics of the theme. 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.</p> <p>D3 Evaluate & Improve identify a style from different themes • I can plan what to do next • Look at a range of t-shirts from the 20th century and identify important features • Evaluate my t-shirt against design criteria.</p> 
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Su	<p><u>Mr Fox's Veggie Biscuits</u> [Cooking: sweet, baking]</p>  <ul style="list-style-type: none"> • Biscuits are a food source and are eaten as a snack. • They are not always healthy and with sugar and fat content they need to be an occasional treat. • I know that a biscuit is a dry shaped food that can be layered, enrobed, savoury and sweet. • I know that biscuits can be vegan and vegetarian depending on ingredients • Ingredients means the things you put in food when cooking • Utensils means the tools you use to cook. • A recipe is cooking instructions of a particular food • People publish recipes as books for others to buy and read/make. 	
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		<p>D1 Design & Plan Design appetising biscuits based on a template recipe • Adapt the recipe with purposeful, functional alternative ingredients □ Generate, develop, model and communicate their biscuit recipes and evaluations ideas through talking, drawing, templates, mock-ups publish my recipe for others to read</p> <p>D2 Make & Construct Mix, roll, knead and shape dough and cut out biscuits reliably with a cutter • Select appropriate utensils to achieve outcomes.</p> <p>D3 Evaluate & Improve Explore and evaluate a range of cookie and biscuits. Evaluate their biscuits against design criteria.</p> <p>D5 Cooking & Nutrition Use the basic principles of a healthy and varied diet to prepare dishes • Select from and use a range of cooking utensils to mix, roll, shape and bake biscuits. Select from and use a wide range of ingredients, according to their characteristics, ensuring that the biscuits are vegetarian and would appeal to the rabbit family.</p> 
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Year C

Ter m **Substantive Knowledge:** “I know that” (*What we are learning about*) **Disciplinary Knowledge** “I know how to” (*What we are learning that scientists do.*) [See Science progression of skills for age-appropriate descriptors.]

Aut



Puppets [Textiles]
Pupils will explore a range of puppets and their materials and then design, safely manufacture and evaluate their own glove puppet. They will engage with feedback from peers and evaluate their experience of working with textiles.

- A puppet is a toy which can be used in dramas and plays
- There are different types of puppets (string and glove)
- You work a glove puppet with your hand
- Fabric can be glued or stitched




D1 Design & Plan Design a glove puppet from a brief, choosing what it will represent, colour and pattern.
D2 Make & Manufacture Make a puppet safely joining the fabric and affixing details with basic stitching and glue.
D3 Evaluate & Improve Explore and evaluate a range of puppets • Evaluate their ideas and products against design criteria.
D4 Use & Apply Explore how their joining processes can be made stiffer and more stable (tighter stitches, more glue, letting it dry etc.)

Spr

The Great Fire of London! [Structures]
Pupils will explore building materials and historical buildings and then design, safely construct and evaluate a model building for strength and stiffness. They will consider the properties of the materials safely, including flammability and learn vital safety lessons about constructing with paper and wood, theorising about modern building materials.

- Buildings are made of materials which are strong and stiff like wood, brick and metal.
- Building materials have developed over time to become safer and offer more protection.
- Structures, can be made stronger, stiffer and more stable
- Buildings need to give shelter from wind, rain and be stable.


D1 Design & Plan Design purposeful, functional structures which give shelter, stand up and offer shelter • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.
D2 Make & Manufacture Select from and use a range of tools and equipment to measure, cut, join and construct simple buildings [staff to confirm] Select from and use a wide range of materials and components, according to their characteristics (strength and durability).
D3 Evaluate & Improve Explore and evaluate a range of existing products (toy houses existing buildings, and 17th century buildings) • Explore how using different materials change the effectiveness of the structure • Evaluate their ideas and products against design criteria.
D4 Use & Apply Build structures, exploring how they can be made stronger, stiffer and more stable.

Su m


Tropical Fruit Salad [Cooking: sweet, uncooked]

Pupils will explore native and tropical fruit and then design, safely prepare and evaluate a fruit salad using edged utensils to cut, peel and scoop. They will consider the origin of the ingredients, the “food miles” associated with their dish and the nutritional value of their ingredients.

- Foods (including fruits) come from different countries around the world, including the UK
- It is healthy to eat a range of fruits, not just the same one
- Naturally brightly coloured food is good for me
- I know fruit contains sugar, but also vitamins and fibre.
- Ingredients can be sourced locally (e.g. strawberries or cherries from Worcestershire) or from farther afield (e.g. e.g. Tanzanian pineapples and bananas).
- Knives are sharp and need to be used with care.



D1 Design & Plan Design a fruit salad using tropical fruits, which is colourful and has a range of appealing ingredients.
D2 Make & Manufacture Select ingredients from a range of fruits, based on taste and colour • Present fruit salad in an appetising way, listing ingredients.
D3 Evaluate & Improve Explore and evaluate a range of fruits • Evaluate their ideas and products against design criteria.
D5 Cooking & Nutrition Use the basic principles of a healthy and varied diet (using fruit as a healthy option – having a range of colours and textures) to prepare dishes. • Use knives safely to cut soft fruit • Select from and use a wide range of ingredients, according to their characteristics (origin, colour and taste).



Year A

Term **Substantive Knowledge:** "I know that" (*What we are learning about*)

Aut
1



Savoury Hummus & Crudités

- A healthy and varied diet is important.
- Different foods originate in different parts of the world.
- I know that hummus is made from chickpeas, tahini, oil and water with added flavours.
- Designers and manufacturers innovate on classic recipe substituting pulses, herbs, spices and oils to make their product attractive and appetising.
- A range of ingredients with a plant origin will give vitamins and good gut health.

Disciplinary Knowledge "I know how to" (*What we are learning that scientists do.*) [See Science progression of skills for age-appropriate descriptors.]

D1 Design & Plan Develop accurate and clear recipes (with amounts and proportions) for their own hummus and crudité dish, writing this as an appetising and well laid out recipe and ensuring that the practical design and serving of the dish is appetising and considered, aimed at being eaten by peers and members of staff.

D2 Make & Manufacture Select from and use a wider range of tools and equipment to perform practical tasks (metal edged knives, graters, measuring spoons and cups, hand blender), and a wide range of ingredients (pulses, juices, oils, herbs, spices and seasonings) to make their hummus product appetising, interesting and attractive).

D3 Evaluate & Improve Investigate and analyse a range of existing hummus (chickpea based and other pulses and beans) including tasting and sampling ingredients alone and in combination. Evaluate their ideas and products against their own design criteria and taking feedback from potential consumers and acting on it.

D5 Cooking & Nutrition Choose ingredients with low salt and sugar and a minimum of processing. Combine several plant-based ingredients so aid a healthy diet and gut biome.

Explain which ingredients grow locally and which are currently in season. Where not local or seasonal, explain how they got here and how they are available (frozen, dried, bottled etc.)



Spr

Model Anglo Saxon Village [Structures/Mechanical Systems: electrical]

- Some products are designed and made with light and sound built in (like children's toys or museum exhibits).
- Series circuits can be used in design and manufacturing to incorporate switches and bulbs into products to make them attractive, interesting and more useful.
- Structures can be strengthened, stiffened and reinforced using different techniques.
- Electrical batteries need to be stored, treated and disposed of with care; mains electricity can be very dangerous and must be used with caution.



D1 Design & Plan Use research and develop design criteria to inform the design of a model village with working light and sound.



Generate, develop, model and communicate their model village ideas through discussion and annotated sketches, building prototypes as part of a development process.

D2 Make & Manufacture Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. [thick cardboard, paint and glue, masking tape and Sellotape, dowel], etc.

Evaluate & Improve Investigate and analyse a range of existing products which use light and sound in them, looking safely at their function, construction and circuits. Evaluate their ideas and products against their own design criteria. Consider the views of others to improve their work, taking feedback from other pupils working as designers.

Use & Apply Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Understand and use electrical systems in their products, wiring up controllable bulbs in series circuits as lights and using recorded soundtrack (iPad, talking tin, talking postcards).

Sum



Design and Manufacture Viking longship, as a toy for a younger child.

- Real designers and manufactures make toy boats and full-size boats.
- They must be both buoyant, balanced and watertight as both must be safe, easy to use, good to look at and value for money.
- The shape of the design will affect its speed and stability in the water.
- Some materials are more strong, waterproof and buoyant than others.

D1 Design & Plan Use research and develop design criteria to inform the design of longships which float and carry weight aimed as toys for younger children • Generate, develop, model and communicate their longboat ideas through discussion and annotated sketches, building prototypes as part of a development process.

D2 Make & Manufacture Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. [dowel, balsa, cardboard, glue gun etc.]. Select from and use a wider range of materials and components, including wood and textiles.

D3 Evaluate & Improve Investigate and analyse a range of existing products (including toy boats of different materials). Evaluate their ideas and products against their own design criteria. Consider the views of others to improve their work. Refine and improve based on water and burden tests.

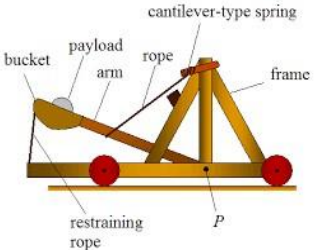
D4 Use & Apply Apply their understanding of how to strengthen, stiffen and reinforce more complex structures to ensure boat holds 10 Playmobil characters and mast stays straight.



Year B

Term **Substantive Knowledge:** "I know that" (*What we are learning about*)

Design and manufacture a working Roman Catapult. [Mechanical systems: levers]
 Pupils will research, design, safely manufacture and evaluate a ballistic device which must fire a projectile with force and accuracy. They will learn empathy and respect for the Roman manufacturers of these products but consider the remember the context that these are machines of war and destruction in the light of our Safety, Respect and Value Christian values.




I know that:

- Levers are simple machines that increase a force
- The ballista relies on tension to throw a projectile
- In order to work it needs a strong structure, which is why we use wood
- To create the tension it needs a material which can be pulled tight, like string.
- Key events and individuals in ancient civilisations (such as the Romans) have helped shape the world.

- Designs have changed over time due to functional need and advances in technology.

Design and manufacture a Buzz Wire Game [Mechanical systems: buzzers]
 Pupils will research, design and safely manufacture their own working buzzer puzzles, ensuring they are attractive and fun, challenging but manageable and electrically safe and effective. They will learn a safe respect for electricity in the process.

- Many products use electricity for light, sound or moving parts
- Series circuits can incorporate switches and buzzers.
- A buzzwire game is a toy which tests co-ordination.
- Electricity is a dangerous force and must be used with safety and respect.
- We are using metal for the wire as it conducts electricity and cardboard for the frame as it does not.



Design and Cook a Pizza [Cooking: savoury and nutritious]
 Pupils will research, design, safely cook and evaluate their own savoury pizzas using healthy, ingredients and learning about the nutritious potential of this meal within a balanced diet and its origins in Italy and America.

- A healthy and varied diet is important
- Different (fresh) produce is available at different times of the year
- There is a large difference between the health benefits of fresh, homemade pizza and processed pizza (sugar, salt and fat content).
- Produce can be bought dried, frozen or tinned when it is not in season.
- Pizza originated in Italy and was developed in America by Italian immigrants.
- It is made from flour, oil, water, yeast (for the base) and a minimum of tomatoes and cheese for the topping.
- It is customary to add different toppings according to taste.



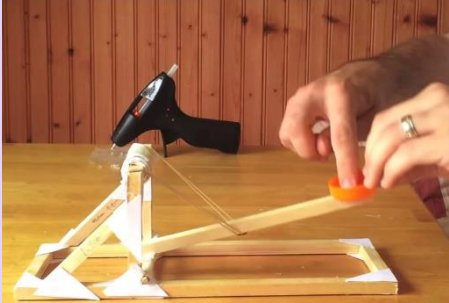
Disciplinary Knowledge "I know how to" (*What we are learning that designers and technicians do.*)

D1 Design & Plan Research the materials, manufacture and function of ancient catapults • develop design criteria to inform the design of a working catapult which is able to knock down a "fortification" (wooden brick structure.) • Generate their ideas through discussion, annotated sketches, and labelled diagrams, choosing a design for the purpose.

D2 Make & Construct Construct a simple mechanism using a lever • Construct the catapult by cutting, joining and finishing in wood and string, safely and efficiently selecting appropriate tools based on their function and materials on their properties.

D3 Evaluate & Improve Investigate and analyse how catapults worked in ancient times and how toy catapults are made today • evaluate their ideas and products against their own design criteria, including field testing • consider the views of others to improve their work.

D4 Use & Apply Apply their understanding of how to strengthen, stiffen and reinforce more complex structures so that catapults can take tension and function • Understand and use levers in a product.

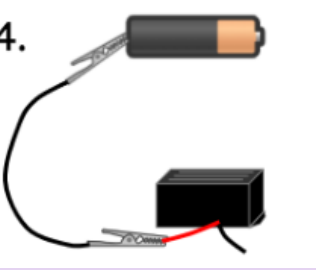


D1 Create & Critique Develop a design and a plan for a buzzwire game based on knowledge of electric circuits and how such toys are manufactured • Develop design criteria for a toy aimed at younger children • Generate ideas orally and in sketches and articulate them through drawing, writing and presentation.

D2 Make & Construct Construct a buzzwire game that is strong enough to be played and support the wire • Construct an electric circuit that works • Select appropriate tools to cut, join and construct the buzzwire game including safely cutting wire.

D3 Evaluate & Improve Improve products against a design criteria and respond to feedback from others • Evaluate finished game against the design criteria and the younger child's feedback.

D4 Use & Apply Use a series circuit with a switch and buzzer to allow the game to be played. Incorporate this appropriately and tidily into the game.




D1 Create & Critique Research and understand the origin, format and ingredients of a pizza and distinguish between the different types and their healthiness (processed frozen – take-away – restaurant – freshly made at home) • Design own pizza recipe including basic dough & sauce and toppings based on market research.

D2 Make and Construct Mix and knead dough • Make a circular pizza from a ball of dough • Arrange appropriate toppings evenly in a way which is appetising safely use culinary processes to prepare ingredients: grate, chop, spread, mix roll, knead, measure • Select appropriate utensils to grate, chop, mix and cut select appropriate ingredients for taste and appearance.

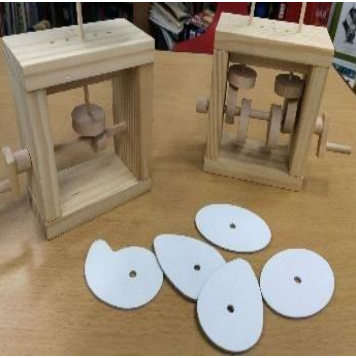
D3 Evaluate & Improve Research and evaluate pizzas available in shops using a star diagram • Improve own work based on feedback • evaluate finished product against design criteria and plan / recipe.


D5 Understand and Apply Understand the principles of a healthy and varied diet cook a savoury dish which is popular and nutritious (pizza) using few fresh ingredients and low salt, sugar and saturated fat • Understand seasonality, understanding that some of these ingredients come from the UK and some (olive oil) come from the Mediterranean.





Year C

Term	Substantive Knowledge: "I know that" (<i>What we are learning about</i>)	Disciplinary Knowledge "I know how to" (<i>What we are learning that scientists do.</i>) [See Science progression of skills for age-appropriate descriptors.]
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Aut	<p>Mechanical Rainforest Exhibits [Working with wood] Pupils will make a moving exhibit to show elements of their learning about rainforests, using wood and understanding cam mechanisms.</p>  <ul style="list-style-type: none"> • Cams are used to change the direction of motion • Levers are simple machines that increase a force) • Different shaped cams/levers have different effects • Cams and levers are used in machines with moving parts, like moving toys. • Wood is a suitable material as it is: <ul style="list-style-type: none"> i) good looking, ii) can be cut and glued iii) stiff enough to give strength and structure.
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<p>Design & Plan Use diagrams and writing to plan and design a mechanical toy with a rainforest theme which is fit for purpose as a toy for a younger child.</p> <p>D2 Make & Construct Make a moving toy by combining cams and levers strategically so that the animals move up and down. • Construct a toy with strength and stiffness so that it stands up and can be used.</p> <p>D3 Evaluate & Improve Evaluate toys with cams and levers and discuss how they work and what their purpose is • Respond to feedback during the design and manufacture phase • evaluate the finished product against the brief</p> <p>D4 Use & Apply Use and apply knowledge and understanding of cutting cardboard and sawing wood safely and accurately • measure wood and cardboard before cutting to ensure it is accurate and fit for purpose • use glue safely and neatly to join frame • sand rough edges for safety and finish.</p>	
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Spr 1	<p>Working with textiles Children will research, design, safely manufacture and evaluate a soft toy in order to develop knowledge and understanding of fabric and textile processes and develop respect and empathy for the experiences of evacuated wartime children.</p> <ul style="list-style-type: none"> • Sewing is one way of joining fabric, (as opposed to stitching, gluing, stapling, etc.) • Manufacturing with fabric and material (clothes, toys, furnishings etc.) is called textiles. • Sewing uses a needle and a thread and needs to be done safely and carefully • The different ways of joining are called "stitches" 
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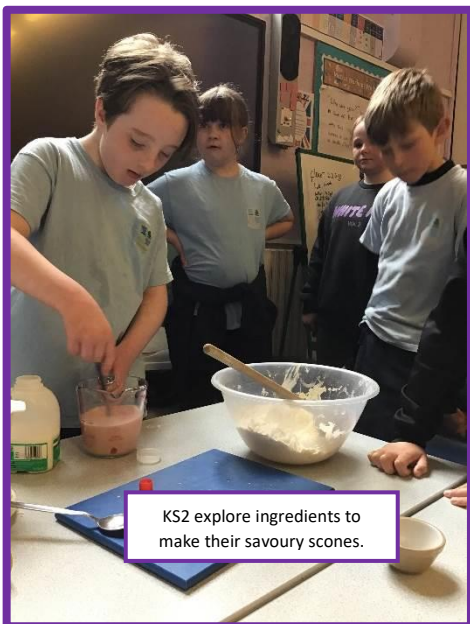
	<p>D1 Design & Plan Design an original soft toy and create plans including labelled diagram and lists of materials and processes in drawings, writing and using digital technology.</p> <p>D2 Make & Construct Make a soft toy for an evacuated child by using suitable materials and tools based on a brief • use cutting tools safely and join / affix using needle and thread.</p> <p>D3 Evaluate & Improve Investigate and analyse a range of existing soft toys, both modern and period (WW2), looking at how they are constructed, coloured, joined and finished, including the materials used • respond to feedback during the design and manufacturing process • evaluate finished toy against brief and design.</p> <p>D4 Use & Apply Thread a needle • Use needle, thread and safe sewing techniques to join and enclose shapes with fabric • Apply practice in stitching and sewing to product manufacture • sew a running stitch • Tie off with a finishing knot.</p>
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Sum	<p>Savoury Herb Scones with local ingredients [Baking] Pupils will research, design, safely bake and evaluate their own savoury herb scones using healthy, seasonal and locally sourced ingredients, and learning about the nutritious potential of this meal within a balanced diet.</p>  <ul style="list-style-type: none"> • A healthy and varied diet is important. • Scones are high in fat and carbohydrate and must be eaten as part of a balanced diet • Different herbs are available at different times of year (seasonality). • I know that scones are made from flour, fat and water with added flavourings and cooked in an oven. • Scones can also be sweet but these are savoury.
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<p>D1 Design & Plan Create plans and recipes for scones, listing ingredients and processes.</p> <p>D2 Make & Construct Select appropriate utensils to safely and effectively mix, roll, knead, shape, cut, finish and bake scones, including using the oven safely • Select from familiar and unfamiliar ingredients combining them to taste and appearance, when planning scone recipes. • measure and use the appropriate amounts of ingredients using measuring equipment.</p> <p>D3 Evaluate & Improve Investigate and analyse a range of existing sweet and savoury scones when developing their own recipes • sample and evaluate herbs and other ingredients and make informed choices when using • evaluate their recipes and bakes, against their own design criteria and consider the views of others to improve their work.</p> <p>D5 Cooking Understand and apply the principles of a healthy and varied diet • Prepare scone mix, shape it and bake it in the oven allowing scones to cool • Use seasonal ingredients and say where ingredients come from and if they are local and/or seasonal.</p>	
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Year A		Year B	Year C
Term	Substantive Knowledge: "I know that" (<i>What we are learning about</i>)		Disciplinary Knowledge "I know how to" (<i>What we are learning that scientists do.</i>) [See Science progression of skills for age-appropriate descriptors.]
Aut	 <p><u>Outdoor Survival Shelters</u> [Structures: large scale]</p> <ul style="list-style-type: none"> Human beings have but shelters in extreme conditions through history. Shelters need to be strong, windproof, waterproof and comfortable. Stiffening and strengthening can be done by tying together several thin sticks, poles or branches into one stronger thick pole. String, ties and rope can be used to secure waterproofing and <ul style="list-style-type: none"> Testing in good weather will ensure survival standards in bad weather. 	<p>D1 Design & Plan Use research and develop design criteria to inform the design of strong, functional, waterproof and comfortable shelters that are fit for purpose, aimed at sheltering themselves, and design tests to evaluate shelters. • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design, creating their shelter ideas in 3D CAD (TinkerCAD).</p> <p>D2 Make & Construct Select from and use a wider range of tools and equipment (rope, hacksaw, hammer & nails, screws and screwdriver) to perform practical tasks (cutting, fastening, 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 (e.g. wood, MDF / hardboard / plastic, fabric, cotton, polyester).</p> <p>D3 Evaluate & Improve Investigate and evaluate permanent and semi-permanent shelters in order to develop own examples • Peer evaluate own drawings and CAD representations of designs. Evaluate shelters, making improvements, through three tests wind test (feather moving in shelter) water test (bucket of water on shelter) and comfort test (impartial adult must be able to curl up comfortably inside.) • Consider the views of others to improve their work.</p> <p>D4 Use & Apply Apply their understanding of how to strengthen, stiffen and reinforce more complex structures using string, rope, plastic ties • Draw on prior knowledge of strong structures and waterproofing to make a shelter which could protect a human being, applying this to wind proofing.</p>	
Spr	<p><u>Nutritious Winter Soup</u> [Cooking: hot, savoury, seasonal and ambitious] Pupils will research, design, safely cook and evaluate a soup that is seasonal, nutritious and involves a range of processes. They will focus on the potential of healthy and carefully prepared soups to provide essential vegetables, protein and fibre in their diet and those they cook for in the future.</p> <ul style="list-style-type: none"> Commercially successful soups combine flavours and textures which are appetising once cooked. Winter soups often use root vegetables which grow in autumn and winter and store well. Commercial soups have appetising and inviting branding which promises a value (healthy eating, comfort, travel, etc.) Home cooked soup is a healthy and nutritious way to provide a balanced diet All edged tools need careful use and safety precautions. 	 	<p>D1 Design & Plan Create plans and recipes for soups, listing ingredients and processes.</p> <p>D2 Make & Construct Select and use appropriate edged utensils to prepare vegetables (knife, grater, mandolin) • Grate, chop, dice, sweat and boil ingredients safely • Use the hob, microwave and pans safely with appropriate safety precautions and equipment • select seasonal ingredients which have health benefits • measure and use the appropriate amounts of ingredients using measuring equipment.</p> <p>D3 Evaluate & Improve Investigate and analyse a range of existing winter soups when developing their own recipes • Sample and evaluate healthy seasonal ingredients and make informed choices when planning recipes • evaluate their recipes and soups, against their own design criteria and consider the views of others to improve their work.</p> <p>D5 Cooking Understand and apply the principles of a healthy and varied diet • Prepare a soup and serve safely • Use seasonal ingredients and say where ingredients come from and if they are local and/or seasonal.</p>
Sum	 <p><u>Enterprise initiative</u> [D&T in authentic practice] Pupils will research, pitch, bid for funding, manage a budget and manufacture products based on market research, using design and technology in the real world and keeping some profit whilst donating a portion to charity to engage with courageous advocacy and learn the value and potential of making money.</p> <p>I will know that:</p> <ul style="list-style-type: none"> An entrepreneur is a businessperson who combines creativity with business acumen. Profit means the revenue is greater than the production costs. Entrepreneurs need to account for spending on materials and production in their pricing Products need to be consistent and uniform. Unsold stock must be deducted from profit. 	<p>D1 Design & Plan 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 and costed to generate revenue and profit, including a charitable donation • Generate, develop, model and communicate their ideas through discussion, pitching to a backer and submitting a costed proposal</p> <p>D2 Make & Construct Select from their prior learning to safely and consistently make, manufacture, cook and produce publicity material, flyers, posters and a range of products, including their containers where relevant.</p> <p>D3 Evaluate & Improve Evaluate a range of products and respond to market research when devising products • respond to questioning and feedback from backers and sponsors • develop, refine and evaluate a business idea • make decisions about product cost, projected profits and then evaluate the effectiveness of this.</p> <p>D4 Use & Apply Use computing and technology to research, cost and advertise a product • apply processes from prior D&T learning a manufacture a product safely and consistently.</p> <p>D5 Cooking & Nutrition Where cooking, practice good hygiene and use utensils and processes safely • be able to evaluate the health, provenance and seasonality of products.</p>	

3 Pedagogy: Learning & Teaching Design & Technology



3.1 D&T will be taught as a discrete subject, expressing the National Curriculum's aims and programmes of study in termly themed planning. We will teach and assess the curriculum mapped above (2 Curriculum) and the progression of specifically historical behaviours outlined below (4 Assessment). Science learning will be recorded in its own D&T exercise book. High quality resources, the right equipment, materials and displays will enrich the experience.

3.2 In addition to being taught as a discrete subject, D&T will form part of a rich, cross-curricular curriculum, and other subject disciplines will be strategically used to deepen understanding and widen the context of the subject, for example by making longships which float or rainforest toys.

3.3 Above all, our pedagogical approach to science will allow children to answer the question "where do the products we see around us every day (including buildings and vehicles) come from. Who imagines and invents them and how do they turn from an idea into a thing I can buy or use.

3.4 Children will explore the design and technology knowledge they are learning through trial and error, mocking up ideas, planning in words and diagrams and conducting consumer surveys and getting feedback. They will work alone, in pairs and in teams, evaluating and improving products and reporting on the results. Children will build the idea that they benefit from good design and technology, and they could make a career out of it, designing and making products which will enhance the lives of others.

4 Assessment






Assessment in D&T will establish the extent to which children are gaining and retaining substantive knowledge about the design process and the application of disciplinary skills to make and present products. This will be done through a range of techniques in line with our assessment policy, but which will include most, but not all of:

- Entry quizzes and assessment tasks.
- Exit quizzes and assessment tasks.
- Questioning in lessons, individual, group and class.
- Marking ongoing D&T recording where relevant, including plans, prototypes, photographs and evaluations.
- Observing cooking, making and construct in the classroom.
- Assessment of related content in other subject domains (e.g. e.g. secure and strong construction of the housing for an electricity experiment).
- Observation of discussion, debates, presentations.

Judgements will be made as a secure fit, and records kept of pupils who are working **below**, **at** or **above** their chronological year.



✂ Malvern Wyche C of E Primary School *Design & Technology* Progression of skills

Document	EYFS	KS1 National Curriculum		KS2 National Curriculum			
Phase	Reception, Year 1 & 2			Year 3, 4 & 5			Year 6
Year	R	1	2	3	4	5	6
	<i>In an enabling environment</i>	<i>With support</i>	<i>Competently</i>	<i>With support</i>	<i>Competently</i>	<i>Reliably</i>	<i>Confidently</i>
D1 Design & Plan 	Represent their own ideas, thoughts and feelings through design and technology. Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function to design, plan, make and evaluate products in the simplest terms.	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.	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.				
D2 Make & Construct 		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.	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				
D3 Evaluate & Improve 	Safely use what they have learnt about media and materials in original ways, thinking about uses and purposes, designing, making and valuing simple products. Safely select and use utensils for the purpose of preparing and tasting simple dishes.	Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria Technical knowledge.	Investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria. Consider the views of others to improve their work.				
D4 Use & Apply 		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.	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.				
D5 Cooking & Nutrition 	Use the basic principles of a healthy and varied diet to prepare dishes. Select from and use a range of cooking utensils to perform practical food preparation tasks. Select from and use a wide range of ingredients, according to their characteristics.	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.					

By the end of...	Progress Statement	The Wyche Way practical (disciplinary) knowledge descriptor for Design & Technology (pupils are successful when, by the end of the year ...)
Reception	In an enabling environment	<ul style="list-style-type: none"> • Pupils develop skills, abilities and emergent awareness through formal and informal early learning. • Pupils explore the world around them developing skills and abilities through trial and error. • There are high levels of adult- and peer- interaction and exploratory and experiential learning.
Year 1	With Support	<ul style="list-style-type: none"> • Pupils will demonstrate <i>many</i> of the end of Key Stage 1 D&T skills and processes <i>with support</i> from adults. • They make many mistakes and are supported to recognise them and learn from them. • They need repetition, re-iteration and reminders to achieve reliable results.
Year 2	Competently	<ul style="list-style-type: none"> • Pupils will <i>use & apply</i> end of KS1 D&T skills and processes with <i>minimal support</i>. • They make mistakes and are beginning to accept feedback and self-correct with support.
Year 3	With Support	<ul style="list-style-type: none"> • Pupils demonstrate <i>some</i> KS1 & 2 D&T skills and processes with frequent support and supervision. • They make frequent mistakes and are beginning to accept and respond to feedback.
Year 4	Competently	<ul style="list-style-type: none"> • Pupils demonstrate <i>many</i> KS1 & 2 science skills and processes with occasional support and reminders. • They are beginning to learn from their mistakes and accept and respond to feedback.
Year 5	Reliably	<ul style="list-style-type: none"> • Pupils demonstrate <i>most</i> KS1 & 2 science skills and processes with <i>occasional</i> support and supervision. • They achieve mostly reliable results and self-correct, frequently learning from mistakes. • They begin to instruct and advise others with adult oversight.
Year 6	Confidently	<ul style="list-style-type: none"> • Pupils demonstrate <i>all</i> primary science skills and processes with minimal support and supervision. • They achieve consistent and predictable results, recognising and valuing their mistakes. • They are confident to instruct and advise others.

5 Design & Technology Glossary



Apply This is where pupils take practical or academic knowledge and try it in another context, to see if it works or because the evidence says it will work. For example, after peeling those apples successfully, Heidi applied this knowledge to the carrots.

Cooking This means the safe and hygienic preparation of food ingredients and the construction of familiar dishes for others to eat. At first children will use raw ingredients and will graduate to cooked ingredients with greater processes. Children will make both sweet and savoury dishes.

Designing This means the creative act of conceiving a new product: what it will look like and be made from, how it will be made and how it will work, based on practical considerations, a brief, a budget and market demand. Children's learning about design will be based on observation of similar real-world products and market research.

Evaluating Pupils will make decisions about the quality of their ideas, their product, the process they have been through and the reception by the client or brief.

Improving Based on evaluation or feedback, children will make changes to ideas, products or processes towards achieving a better outcome, more in line with the brief, customer feedback or aesthetic appearance.

Making This is the process by which children physically create products, but don't make them out of several separate pieces. For example, baking a scone, or fashioning a bag from a single piece of cloth.

Constructing This means making a structure from either a kit (Lego, K-NEX) or specific materials (e.g. card and plastic, natural materials when den building) It implies strength, balance and solidity.

Nutrition This describes what the body needs from food to function well and remain healthy, and the degree to which ingredients or finished meals offer the body a) sufficient nutrition, (vitamins, fibre, good fat and carbohydrate) and b) elements which need to be eaten in moderation or with caution (saturated fat, high salt, artificial colours and additives).

Planning A process by which designers order and structure their ideas, either verbally, in writing or diagrams, usually with annotations about the size, shape and cost about the materials they are using. And the process that they will use. Plans can change as evaluation reveals weaknesses and strengths.

Use This means pupils make practical use of a material or idea to produce a product. Peter used wood to stiffen his building as it is inflexible.

