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# Knowledge and Skills Progression: DT

National Curriculum	Curriculum intent - skills, attitudes and knowledge that we would like	
<p>Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact.</p> <p><u>Aims:</u></p> <ul style="list-style-type: none"> <li>• Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate in an increasingly technological world</li> <li>• Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users</li> <li>• Critique, evaluate and test their ideas and products and the work of others</li> <li>• Understand the principles of nutrition and learn to cook.</li> </ul>	<p>At The Fern Academy, we want our children to become confident, independent problem solvers, who view challenges with curiosity and a 'what about trying...' mindset - both at school and in their wider life beyond.</p> <p>We understand the importance of exposing our pupils to a wide range of products that can inspire their curiosity and creativity, as well as the thought-processes involved in creating such products. Through this exposure, children take on the role of developer, evaluator and that of a critique, exploring how products can be developed or adapted for different users as well as creating and testing prototypes to give purpose to a variety of projects.</p> <p>Our aim is for our children to understand the world around them; and their role within it. Linking learning to their own experiences and local or global issues is vital in preparing them for their future. In teaching Design and Technology, we want to provide ample opportunities for our children to be creative, solve problems and feel inspired. We will also work with our children to instil a love of cooking so that they may gain greater independence and the ability to feed themselves and others, affordably and well, both now and in later life.</p> <p>To that end, children will have the practical and technical skills needed to put their ideas into practice - and the wherewithal to overcome whatever barriers may present themselves on the way.</p> <p>All children will be given opportunities to explore new materials, tools, mechanisms and designs, and will be encouraged to explore all of these to find both their potential and their limitations. They will study the work of significant individuals (inventors, engineers, architects and activists), from different cultures, both past and present. Our children will also learn how to use these materials and tools safely and responsibly, and over time will begin to consider the impact that products (and material choices) can have on the wider world.</p>	
Links to learning in EYFS:	Links to other subjects / curriculum areas:	Experiences and opportunities every child will have at The Fern Academy:
<p><u>EAD : Exploring &amp; using media and materials</u></p> <ul style="list-style-type: none"> <li>• Manipulates materials to achieve a planned effect</li> <li>• Constructs with a purpose in mind, using a variety of resources</li> <li>• Selects appropriate resources and adapts work where necessary</li> <li>• Selects tools and techniques needed to shape, assemble and join materials they are using.</li> <li>• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</li> </ul>	<ul style="list-style-type: none"> <li>• Solving problems linked to materials or contexts being explored (e.g. forces) in science.</li> <li>• Measuring, estimating and interpreting scales, calculating costs or capacities links to maths</li> <li>• Exploring foods from different cultures and festivals links to geography and RE topics</li> <li>• Applying IT knowledge to product designs involving electrical systems (e.g. coding and programming a road safety product).</li> <li>• Application of art and design skills when considering finish, choice of materials &amp; product aesthetics.</li> <li>• Preparing for life in modern Britain and PSHE links (for example, recycling old materials to make new products, designing products linked to road safety).</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunities to use things they have made - recognising that their work really is purposeful and practical</li> <li>• Explore the designs, inventions and successes of significant individuals from different cultures.</li> <li>• Taste and try new foods and dishes from other parts of the world, and use these ingredients and cooking methods in their own dishes.</li> <li>• Use saws, hammers, hand drills and other equipment (and know how to use them safely)</li> <li>• Design, develop and evaluate a variety of practical products for consumers.</li> </ul>







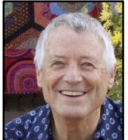







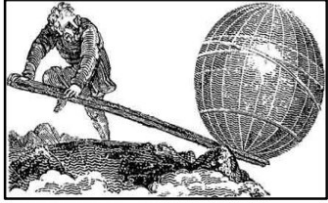



## Opportunities to develop and use the school values in our D.T. curriculum

Resilience	<ul style="list-style-type: none"> <li>• Explore the potential, capabilities and limitations of different materials.</li> <li>• In product design, use trial and error, try things, take risks and manage setbacks.</li> <li>• Develop imaginative and innovative solutions to problems.</li> <li>• Set ambitious goals for a task - What can we do that will make this better? Can we come up with a more innovative, interesting solution to this problem?</li> </ul>
Kindness	<ul style="list-style-type: none"> <li>• Consider the needs, wants and preferences of others when designing.</li> <li>• Help other pupils to use artistic tools carefully and responsibly</li> <li>• Work pro-actively and considerately in peer groups to complete complex tasks that could not be accomplished independently.</li> <li>• Share ideas, resources, ingredients and tools.</li> </ul>
Understanding	<ul style="list-style-type: none"> <li>• Develop understanding through questioning - How does that work? Why have those materials been used?</li> <li>• Understand issues of sustainability, recycling and the environmental impact of items, and recognise how products may have an impact beyond those that were initially intended</li> <li>• Make products to be used by others, and consider their expectations in terms of functionality and finish</li> <li>• Design and make products that solve real and relevant problems within a variety of contexts.</li> </ul>
Honesty	<ul style="list-style-type: none"> <li>• Give honest feedback to others so that they can develop and improve their work</li> <li>• When evaluating products against the design brief, pupils identify areas for improvement in their own work.</li> <li>• Know that honesty is one of ten principles in good design: "It does not make a product more innovative powerful or valuable than it really is. It does not attempt to manipulate the consumer with promises that cannot be kept." (Dieter Rams).</li> </ul>
Appreciation	<ul style="list-style-type: none"> <li>• Imitate the work and design of others - both peers and 'real world' designers and inventors</li> <li>• Explore products, buildings, foods and festivals from other cultures and treat these with respect</li> <li>• Appreciate feedback from others and using this to make improvements to a design</li> <li>• Recognise the benefits of learning new life skills (e.g. cooking a range of meals, sewing on buttons and making simple repairs).</li> </ul>
Imagination	<ul style="list-style-type: none"> <li>• Recognise that design involves imagining new possibilities that can transform the present and shape the future.</li> <li>• Pupils are encourage to use their own experiences and ideas in creative pieces.</li> <li>• Pupils draw inspiration from many sources (e.g. historical designs that have stood the test of time, and new, cutting-edge designs for the modern world).</li> <li>• Re-imagine products at different stages of the design-making process to achieve the best outcomes.</li> </ul>



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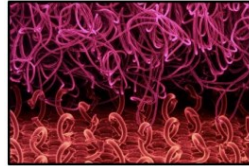
















# DT: Curriculum Mapping and Key Knowledge

Year group	Mechanisms / Structures/ Systems / Food / Textiles / Understanding Materials					
Year One	<p><b>MECHANISMS:</b> Key learning question: <i>How can you make a picture move?</i></p> <p>Key vocabulary: Slider, slot (noun), bridge (noun), push, pull, rigid.</p> <p>Significant Connection: Little Red Riding Hood (Deans of London, 1855).</p> 	<p><b>STRUCTURES:</b> Key learning question: <i>How can you stop a tower from toppling over?</i></p> <p>Key vocabulary: Tower, topple, lean, foundation, balance, perpendicular.</p> <p>Significant Connection: The Leaning Tower of Pisa</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>How does food affect your senses?</i></p> <p>Key vocabulary: senses, vitamins, sensory, caramelise, marinade (verb), ribboning, grating, fruit, vegetables.</p> <p>Connection: Vegetable Kebabs and Rainbow Wraps</p> 	<p><b>UNDERSTANDING MATERIALS:</b> Key learning question: <i>Can you build with bread?</i></p> <p>Key vocabulary: Construction, properties, architect, modify, cement (noun), solidify.</p> <p>Significant Architect: Frank Lloyd Wright (1867-1959).</p> 	<p><b>TEXTILES:</b> Key learning question: <i>How can two squares of fabric keep you warm?</i></p> <p>Key vocabulary: Binca, sewing, Felt, running stitch, attach, felt.</p> <p>Significant Connection: The Bayeux Tapestry (1077)</p> 	<p><b>FOOD AND NUTRITION:</b> Key Learning question: <i>Why are vegetables best?</i></p> <p>Key vocabulary: function, variety, texture, vitamins, nutritious, plane, bending, ribboning.</p> <p>Connection: Vegetable dips, pita pockets and breaded vegetables</p> 
Year Two	<p><b>TEXTILES:</b> Key learning question: <i>How can you repurpose an item of clothing?</i></p> <p>Key vocabulary: Patchwork, over-stitch, repurpose, template, applique, quilt.</p> <p>Significant artist: Frank Havrah 'Kaffe' Fassett (born 1937).</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>What does healthy mean?</i></p> <p>Key vocabulary: Free-range, battery hen, processed, coagulate, vitamins, protein, wholemeal, claw, ribboning, bridge</p> <p>Connection: Salads, quiches and pita chips</p> 	<p><b>MECHANISMS:</b> Key learning question: <i>Are bigger wheels always better?</i></p> <p>Key vocabulary: Wheel, axle, axle-holder, chassis, rotate, position, centre.</p> <p>Significant Inventor: Karl Friedrich-Benz (1844-1929). Inventor of the automobile wheel.</p> 	<p><b>UNDERSTANDING MATERIALS:</b> Key learning question: <i>How can you waterproof a hat?</i></p> <p>Key vocabulary: Manipulate, flexible, barrier, waterproof, resistant, absorbent.</p> <p>Significant Inventor: Arthur Wellesley (1769-1852).</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>How healthy is your food?</i></p> <p>Key vocabulary: Ingredients, fibre, protein, vitamins, processed, starch, claw, grating, bridge.</p> <p>Connection: Overnight oats, potato rosti and quesadilla.</p> 	<p><b>STRUCTURES:</b> Key learning question: <i>How strong is a piece of paper?</i></p> <p>Key vocabulary: paper, crease (noun), corrugated, pillar, storey, load (noun).</p> <p>Significant Architect: Dame Zaha Muhammed Hadid (1950-2016).</p> 
Year Three	<p><b>TEXTILES:</b> Key learning question: <i>How can you make a box out of cloth?</i></p> <p>Key vocabulary: Starch, PVA glue, gelatin, stiffen, interfacing, cloth, solution.</p> <p>Significant Artist: Gisela Stromeyer (fabric structures).</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>What do we mean by a balanced diet?</i></p> <p>Key vocabulary: Seasonal, balance, preserve, stew, pressure, seasoning, slicing.</p> <p>Connection: Fruity yoghurt, DIY popcorn and homemade chips.</p> 	<p><b>MECHANISMS:</b> Key learning question: <i>How can you do a lot of work with little effort?</i></p> <p>Key vocabulary: Lever, linkage, mechanism, force, load, effort, fulcrum.</p> <p>Significant Individual: Archimedes (287BC–212 BC).</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>How does food affect your body and mind?</i></p> <p>Key vocabulary: Nutrition, fibre, minerals, seasoning, claw, bridge, roasting.</p> <p>Connection: Noodle salad, stuffed peppers and roast cauliflower dip.</p> 	<p><b>SYSTEMS:</b> Key learning question: <i>How are things powered?</i></p> <p>Key vocabulary: Energy, energy source, potential energy, kinetic energy, turbine source (noun), source (verb), intermittent, renewable (noun), renewable (adj).</p> <p>Significant Inventor and engineer: William Kakwamba (born 1987)</p> 	<p><b>STRUCTURES:</b> Key learning question: <i>What makes a bridge strong?</i></p> <p>Key vocabulary: gap, deck, pier, suspension, arch, bascule, strength, stability.</p> <p>Significant Connection: Sir John Wolfe Barry (1836-1918); Sir Horace Jones (1819-1887); The Tower Bridge</p> 



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# DT: Curriculum Mapping and Key Knowledge

Year group	Mechanisms / Structures/ Systems / Food / Textiles / Understanding Materials / Electrical Systems					
Year Four	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>What is really in your food?</i></p> <p>Key vocabulary: Ingredients, processed, bread, gluten, knead, ferment, carbohydrates, calcium, shaping, rolling, sautéing. Connection: Pizza, bread rolls and soup.</p> 	<p><b>MECHANISMS:</b> Key learning question: <i>How many ways are there to open a door?</i></p> <p>Key vocabulary: Hinge, knuckle, leaf, pin, barrel, butt hinge, concealed hinge, net. . Significant Connection: London's Tower Bridge</p> 	<p><b>TEXTILES:</b> Key learning question: <i>How do you keep a tea towel from slipping off a hook?</i></p> <p>Key vocabulary: Shank, burr, hoop and loop, buckle (noun), fastener, raw edges, buttons, zippers, press studs. Significant Inventor: George de Mestral (1907–1990). Inventor of @Velcro</p>  	<p><b>STRUCTURES:</b> Key learning question: <i>What shape will give a structure stability?</i></p> <p>Key vocabulary: Structural engineer, Geodesic, gravity, truss, compression, tension Significant Structural engineer: Roma Agrawal (born 1983). The Shard.</p> 	<p><b>ELECTRICAL SYSTEMS:</b> Key learning question: <i>How useful are switches?</i></p> <p>Key vocabulary: Switch, circuit, component, current, interruption, unbroken, conductor, multi-purpose, electrical energy Significant Inventor: Samuel Bagno (motion sensor–1950).</p> 	<p><b>FOOD AND NUTRITION:</b> Key Learning question: <i>Is cheap food always worse for you?</i></p> <p>Key vocabulary: cheap, fusion, texture, shallow-fry, shortening, fragrant, rolling and shaping, slicing. Connection: Veggie rosti, Mexican patties and chickpea curry.</p> 
Year Five	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>Why are our diets so different?</i></p> <p>Key vocabulary: Variety, culture, presentation, smorrebrod, flatbread, mezze, fibre, knead, unleavened, rolling, claw, ribboning. Connection: Flatbreads, smorrebrod and mezze bowls.</p> 	<p><b>SYSTEMS:</b> Key learning question: <i>How can we keep ourselves safe on the road?</i></p> <p>Key vocabulary: Properties, fastener, algorithm, fluorescent, reflective, attachment point, debug, programming, stitch. Significant Inventor: Emily Brooke (Lazerlight).</p> 	<p><b>TEXTILES:</b> Key learning question: <i>What fabric is ideal for creating a functional and head-wearing lunchbag?</i></p> <p>Key vocabulary: Durability, re-purpose, functional, beeswax, swatch, insulate, hook and loop, fastener. . Significant Inventor: Levi Strauss ((1829-1902).</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>What can you learn from other cultures' food types?</i></p> <p>Key vocabulary: Culture, migration, spices, medicinal, fragrant, stir-fry (noun and verb), slicing, ribboning. Connection: Vietnamese Summer rolls, Bombay potatoes and stir-fry.</p> 	<p><b>STRUCUTRES:</b> Key learning question: <i>How are frames structured, reinforced and made more rigid?</i></p> <p>Key vocabulary: Frame, I-beam, struts, brace, metre, gussets. Significant ironmaster and Quaker: Abraham Darby III (The Iron Bridge).</p> 	<p><b>MECHANISMS:</b> Key learning question: <i>How can you lift a car onto a roof?</i></p> <p>Key vocabulary: gear, pulley, mechanism, gear train, driver gear, idler, rotation. Significant Architect: George Washington Gale Ferris Jnr (1859-1896).</p> 
Year Six	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>Can street foods save us?</i></p> <p>Key vocabulary: street food, snack, prove, finely dicing, shaping, kneading, nutrient, yeast, gluten, ferment. . Connection: Burritos, Pitta breads and humous and Samosas.</p> 	<p><b>MECHANISMS:</b> Key learning question: <i>How do pulleys and gears let you see the world?</i></p> <p>Key vocabulary: Pulley, moveable pulley, fixed pulley, block and tackle, rack and pinion, driven gear, gear ratio, effort, force, gear train. Significant Connection: The London Eye</p> 	<p><b>FOOD AND NUTRITION:</b> Key learning question: <i>Does food affect the way you feel?</i></p> <p>Key vocabulary: Staple, nutrient, saute, translucent, dice, al dente, simmer, texture, ribboning, dicing. Connection: Pasta, noodle soup and sensory salads.</p> 	<p><b>STRUCTURES:</b> Key learning question: <i>How strong is a piece of spaghetti?</i></p> <p>Key vocabulary: Guyed mast, flying buttress, load, aesthetic, edifice, constraints. Significant Connection: Blackpool Tower.</p> 	<p><b>ELECTRICAL SYSTEMS:</b> Key learning question: <i>Can switches perform more than one function?</i></p> <p>Key vocabulary: switch, parallel circuit, series circuit, multi-function, brief, simultaneous, component, bulb, buzzer, battery. Significant Inventor: Albert Sadacca (1901-1980). Christmas Tree Lights..</p> 	<p><b>TEXTILES:</b> Key learning question: <i>How can we reduce, recycle and repurpose?</i></p> <p>Key vocabulary: recycle, repurpose, reduce, chain, seal (verb), skein, sititch. Significant Activist and Entrepreneur: Isatou Ceesat (born 1972). The Queen of recycling.</p> 



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# DT: Skills Progression

Year group	Mechanisms	Structures	Systems (including Electrical Systems)	Food and Nutrition	Textiles	Understanding Materials
Year One	<ul style="list-style-type: none"> <li>- Begin to explore different slider mechanisms (e.g. in books, greeting cards and everyday objects).</li> <li>- Be able to define the terms: slider, push, pull, linear and movement, weave and template.</li> <li>- Use scissors and templates to make a paper weave and cut strips of paper accurately.</li> <li>- Make three types of slider mechanism (through two: slots, bridges and runners).</li> <li>- Explain what a bridge is and its purpose.</li> <li>- Select a suitable slider mechanism for a specific design</li> <li>- Evaluate my product and suggest ways in which the movement might be improved.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore how the size of a base (and foundation) affects the stability of a tower.</li> <li>- Define and explore the term 'balance' through practical activities.</li> <li>- Evaluate outcomes and draw conclusions about what makes a tower less likely to topple.</li> <li>- Make and label different types of join and explain how they are made.</li> <li>- Manipulate, fold and cut cardboard accurately.</li> <li>- Use a variety of construction materials to create a free-standing sculpture.</li> <li>- Identify ways in which the stability of a structure can be improved.</li> </ul>		<ul style="list-style-type: none"> <li>- Identify the five senses and five key flavours</li> <li>- Explain the benefits of eating raw vegetables in a variety of colours.</li> <li>- Use a knife safely</li> <li>- Understand that cooking vegetables makes them less nutritious.</li> <li>- Use techniques of grating and rib-boning, blending and dicing safely and with control.</li> <li>- Explore how marinating affects food.</li> <li>- Use vocabulary to describe different aromas (e.g. of herbs and spices), tastes and textures.</li> <li>- Know how to make a simple batter.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify the parts of a needle.</li> <li>- Thread a needle independently.</li> <li>- Punching sewing holes using a hammer and nail.</li> <li>- Make a running stitch.</li> <li>- Describe some of the properties of different threads and yarns.</li> <li>- Use labelling sewing samples to make a record of fabrics.</li> <li>- Attach two pieces of fabric to create a pouch.</li> <li>- Identify strengths and areas for improvement in my work.</li> <li>- Say how my product will suit its intended user.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify a range of properties and their materials.</li> <li>- Decide on criteria to use for sorting materials.</li> <li>- Describing some changing properties (e.g. cement).</li> <li>- Explain how the properties of a material can change when heat is added.</li> <li>- Know how to combine ingredients to make a bonding product.</li> <li>- Make decisions about the suitability of materials for building.</li> <li>- Begin to evaluate outcomes and consider what could have been done differently.</li> </ul>
Year Two	<ul style="list-style-type: none"> <li>- Explain the terms wheel, axle, axle holder and chassis.</li> <li>- Identify fixed and rotating axles in wheeled objects and explain the difference.</li> <li>- Explain how the position and alignment of axles affects the movement of a vehicle.</li> <li>- Record findings and conclusions using appropriate vocabulary.</li> <li>- Design and make a simple vehicle and provide reasoning for design choices.</li> <li>- Cut, measure and join accurately.</li> <li>- Suggest ways in which to improve a model vehicle's construction and performance.</li> </ul>	<ul style="list-style-type: none"> <li>- Fold paper in a variety of ways.</li> <li>- Conduct a fair test and explain the process.</li> <li>- Make a record of the testing process findings and draw simple conclusions.</li> <li>- Experiment with different ways of arranging folded card to make a multi-storey tower.</li> <li>- Design and make a structure according to set criteria.</li> <li>- Conduct a series of tests and suggest ways in which a design should be modified.</li> <li>- Identify strengths and weakness in a finished structure and suggest what changes should be made and why.</li> </ul>		<ul style="list-style-type: none"> <li>- Explore and explain the difference between fresh and processed and ultra-processed foods.</li> <li>- Name an increasing variety of salad vegetables.</li> <li>- Use the claw, bridge and ribboning techniques with increasing control.</li> <li>- Identify foods that contain protein, calcium and fibre.</li> <li>- Name what vitamins and minerals some foods contain.</li> <li>- Make suggestions about flavours and textures can be improved.</li> <li>- Understand that eating healthily involves eating a variety of fresh foods.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify a range of different fabrics.</li> <li>- Create a template for a patchwork design.</li> <li>- Cut and draw shapes accurately.</li> <li>- Explain what applique and over-stitching means.</li> <li>- Explore the history of quilt-making.</li> <li>- Join fabric shapes neatly and securely by over-stitching.</li> <li>- Suggest possible uses for my patchwork samples.</li> <li>- Suggest how my product may be improved.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify features of clothing that make them suitable for different weather conditions.</li> <li>- Use fair testing to determine whether materials are water-proof.</li> <li>- Identify natural and man-made waterproof objects (e.g. feathers and boots).</li> <li>- Explore how absorbent materials can be made water-proof</li> <li>- Pupils apply what they have learnt through research and testing to a design brief (making a waterproof hat out of paper).</li> <li>- Identify necessary modifications.</li> </ul>
Year Three	<ul style="list-style-type: none"> <li>- Identify the components of a lever (fulcrum, effort and load).</li> <li>- Construct and identify different classes of lever (e.g. seesaws, catapults).</li> <li>- Know that linkages are a series of levers and pivots.</li> <li>- Explain the difference between input force movement and output force movement.</li> <li>- Begin to identify different types of movement created by linkages.</li> <li>- Design a simple toy that uses a linkage mechanism to create a desired movement.</li> <li>- Explain how my system works and make suggestions for improvements.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify the key features of a bridge in different types of bridges.</li> <li>- Explain what a bascule and suspension bridge is.</li> <li>- Explore how using weight as a counterbalance can provide stability to bridge structures.</li> <li>- Identify ways in which a paper bridge can be supported using arches, piers and counterweights.</li> <li>- Design and construct bridge to hold a specific weight.</li> <li>- Use construction materials to make three dimensional shapes with secure joins.</li> <li>- Generate ideas about how to modify a design to increase a structure's strength and stability.</li> </ul>	<ul style="list-style-type: none"> <li>- Explain what energy is and identify energy sources from a range of objects</li> <li>- Explain how everyday life would be affected if certain power sources did not exist.</li> <li>- Match objects to their energy source and provide reasoning.</li> <li>- Explain sustainability and identify sustainable energy sources.</li> <li>- Conduct practical experiments to demonstrate the conversion of one form of energy to another.</li> <li>- Explain the achievements of key I inventors exploring their designs, choices and power sources used.</li> <li>- Make accurate recordings using diagrams and sentences.</li> </ul>	<ul style="list-style-type: none"> <li>- Define what is meant by the term 'balanced diet'.</li> <li>- Name different methods of preserving fruit.</li> <li>- Show creativity in use of ingredients and flavour combinations.</li> <li>- Show understanding of moderation when adding flavourings to dishes (e.g. popcorn snacks).</li> <li>- Explore the differences in ingredients between processed and home-made dishes.</li> <li>- Know what foods are carbohydrates and that these foods are essential for energy.</li> <li>- Experiment with a range of seasonings to enhance flavour.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore a range of solutions that can be applied to make a fabric rigid.</li> <li>- Draw conclusions from test results.</li> <li>- Identify the variables that will and will not change in a fair test.</li> <li>- Fold and manipulate fabric to achieve desired effects.</li> <li>- Apply a stiffening agent over a mould to create a desired form.</li> <li>- Make suggestions on how a form can be reinforced and made more rigid.</li> <li>- Identify improvements that could be made to my work.</li> </ul>	



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Year group	Mechanisms	Structures	Systems (including Electrical Systems)	Food and Nutrition	Textiles	Understanding Materials
Year Four	<ul style="list-style-type: none"> <li>- Identify the purpose of a hinge and the features and applications of a variety of hinges (butt, concealed, flush, T, butterfly and barrel hinges).</li> <li>- Use a range of materials and tools to construct different hinge types and evaluate their effectiveness.</li> <li>- Label simple diagrams correctly using technical vocabulary.</li> <li>- Design and make a gift box product that incorporates a working hinge.</li> <li>- Make judgements about the aesthetics of my completed product and suggest improvements.</li> <li>- Make evaluative comments about the effectiveness of my hinge.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify and explain the forces that affect buildings (compression, gravity, tension).</li> <li>- Through testing, explain why cylinders are used in buildings</li> <li>- Investigate the strength and stability of a range of geometric shapes.</li> <li>- Identify which shapes are strongest and most stable in their application and construction.</li> <li>- Summarise and draw accurate conclusions and results from a strength test.</li> <li>- Collaborate with others to design and create a structure from triangles.</li> <li>- Apply previous knowledge and skills to a practical context.</li> </ul>	<ul style="list-style-type: none"> <li>- Know that a switch is a system designed to interrupt the flow of electricity in a circuit.</li> <li>- Build simple circuits to include a switch.</li> <li>- Give examples of appliances that utilise switches.</li> <li>- Draw simple circuits for electrical appliances.</li> <li>- Identify why certain types of switches are used in different appliances.</li> <li>- Add annotated drawings to enhance written explanations.</li> <li>- Identify the use of switches and insulating materials in electrical games.</li> <li>- Pupils create their own electrical game based on the model provided.</li> </ul>	<ul style="list-style-type: none"> <li>- Make different types of dough and use the techniques of kneading, rolling and stretching.</li> <li>- Explain what gluten is and how it affects the texture of dough.</li> <li>Identify and compare ingredients used in mass-produced and homemade products (e.g. pizzas, bread, tinned and fresh soup).</li> <li>- Suggest ways in which a recipe could be adapted or improved.</li> <li>- Explain how yeast and the fermentation process causes bread to rise.</li> <li>- Explore ways of using low-cost, healthy ingredients to make meals.</li> <li>- Learn about the origins of pastry and its use in different cultures.</li> <li>- Define the term fusion in cookery.</li> <li>- Explain the benefits of reducing high meat consumption and identify high-protein ingredients that can be used as meat alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore and identify a range of fasteners and their component parts, identifying the advantages and disadvantages of each.</li> <li>- Explain how and why different fasteners are suitable for different purposes.</li> <li>- Use a range of sewing techniques to secure and attach different materials (e.g. Buttons, zippers, press studs).</li> <li>- Create a working portfolio of my research and findings.</li> <li>- Recall and refer to prior learning when making choices about a product design.</li> <li>- Test out my final product in order to make evaluations and suggest areas for development.</li> </ul>	
Year Five	<ul style="list-style-type: none"> <li>- Explain that gears are toothed wheels on a shaft that, when placed together, transfer rotational movement.</li> <li>- Identify different gear types and their applications.</li> <li>- Construct a simple pulley system to lift a load.</li> <li>- Use diagrams, photographs and annotations to record information and findings.</li> <li>- Identify different types of cranes and their uses.</li> <li>- Explore a range of gear and pulley mechanisms (e.g. Ferris wheels, windmills, ski lifts and wells) and use these as a basis for designs.</li> <li>- Make decisions on how to construct a model from limited materials.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore ways in which frame structures are reinforced.</li> <li>- Judge the success of different joins and give reasons as to why some methods may be less effective than others.</li> <li>- Use modelling materials confidently to create examples of secure joins.</li> <li>- Use carpentry equipment appropriately and safely.</li> <li>- Cut/saw four pieces of wood to a specific length to create a frame.</li> <li>- Construct a frame using triangles acting as gussets and braces.</li> <li>- Apply knowledge of how to make a structure to a specific design brief.</li> <li>- Give reasons for the structural joins used using technical vocabulary.</li> </ul>	<ul style="list-style-type: none"> <li>- Develop a design to a specific brief (keeping ourselves safe on the roads), giving and responding to feedback.</li> <li>- Understand that technology can be used to control, program and monitor products.</li> <li>- Develop an algorithm.</li> <li>- Write and test a simple program using coding knowledge.</li> <li>- Use knowledge of computing to control a product I have designed.</li> <li>- Present a design prototype, explain how it works and how it fulfils a brief.</li> </ul>	<ul style="list-style-type: none"> <li>- Use a greater array of cooking equipment (e.g. griddle pan, pestle and mortar, wok).</li> <li>- Identify foods that originate from different cultures including spices.</li> <li>- Explain and demonstrate techniques to improve the visual appeal of our food.</li> <li>- Show precision and creativity in my arrangement of ingredients.</li> <li>- Explain the nutritional value of a wider range of ingredients (e.g. chickpeas and yoghurt).</li> <li>- Identify and some core ingredients found in different cuisines (Middle-Eastern, Asian, Danish, Indian).</li> <li>- Explore the medicinal properties of certain vegetables (e.g. garlic and ginger).</li> <li>- Explain how UK diets have been influenced by different cuisines.</li> </ul>	<ul style="list-style-type: none"> <li>- Sort a variety of fabrics according to their properties deciding on the criteria for sorting.</li> <li>- Explore the properties of materials used in storage for food.</li> <li>- Explore the effects of coating fabrics with wax.</li> <li>- Decide upon clothing items that can be repurposed as a lunch bag.</li> <li>- Make independent choices about details and embellishments.</li> <li>- Cut and sew with accuracy, following a series of steps.</li> <li>- Separate design criteria into functional and aesthetic.</li> </ul>	
Year Six	<ul style="list-style-type: none"> <li>- Identify different pulley systems such as fixed, moveable and compound.</li> <li>- Make accurate measurements of force using a Newton meter.</li> <li>- Identify differences in types of gears such a spur, worm and bevel.</li> <li>- Identify that adjacent gears work in opposite directions and how the size of a gear wheel affects the speed of rotation.</li> <li>- Identify movements involved in a rack and pinion system.</li> <li>- Make accurate measurements of force and conclude that compound pulleys require the least effort to lift a load.</li> </ul>	<ul style="list-style-type: none"> <li>- Use a systematic approach to test the amount of weight spaghetti can withstand.</li> <li>- Apply methods of binding and compression to increase the amount of weight spaghetti will hold.</li> <li>- Explore the effects of adding flying buttresses to a structure.</li> <li>- Investigate the stability and strength of different 3D shapes (e.g. square-based pyramids/cubes).</li> <li>- Explain how to use guy lines to provide support for a tower.</li> <li>- Pupils make decisions and modifications during the construction process to successfully build a structure that is at least a meter tall (using only marshmallows and spaghetti).</li> </ul>	<ul style="list-style-type: none"> <li>- Identify switches that have a single function and those that are multi-purpose.</li> <li>- Draw circuit diagrams that include a bulb, buzzer and a switch.</li> <li>- Explore and build circuits that will allow components to work independently of other and simultaneously (single and parallel).</li> <li>- Predict the type of circuit required for a specified appliance.</li> <li>- Apply knowledge of circuits and switches to build a multi-function product.</li> <li>- Pupils work collaboratively to explain how they made a torch and fab work independently, simultaneously or both.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore the cultural food traditions of Mexico and the Mediterranean.</li> <li>- Begin to explain how specific nutrients affect the body.</li> <li>- Use a range of knife skills and techniques safely and with increasing accuracy.</li> <li>- Handle and fold pastry accurately and with dexterity.</li> <li>- Cook food on a hob safely and with control.</li> <li>- Explain why specific ingredients are used and how they interact with each other in a recipe.</li> <li>- Make suggestions about how flavours can be adjusted.</li> <li>- Plan a dish for a specific occasion taking into the account the needs and expectations of the consumer/s.</li> </ul>	<ul style="list-style-type: none"> <li>- Generate innovative ideas for creating products from recycled or repurposed materials.</li> <li>- Crochet using repurposed materials.</li> <li>- Identify the properties of plastic and why it is harmful to the environment.</li> <li>- Create a skein of plastic yarn from plastic bags.</li> <li>- Join snack packets by applying heat.</li> <li>- Design and make a bag from recycled materials, explaining reasons for choices and how the bag is made.</li> <li>- Explain how plastic waste affects the planet and how sig individuals are raising awareness.</li> </ul>	