Brompton and Sawdon: Long term Design & Technology curriculum plan

Class 1 Yr A	A1	A2	Sp1	Sp2	Su1	Su2
Science	Animals including Humans	Everyday materials	Seasonal Change / Solar System	Plants	Animals Including Humans	Animals Including Humans
Area	**Food**	**Textiles**	**Mechanics: Levers and Sliders**	**Structure** + Willow weaving /structures _wild School	**Computing**	**Food**
Project	Vegetable Soup	Christmas Decorations	Constructing a Savannah small world. 3D elements	Bug hotels Mini shelters Camouflage Shelters	Chocolate bar designs using software	Fairy Tea Party Cakes and biscuits
Vocabulary	Fruit and vegetable names, names of equipment/utensils sensory vocabulary e.g. soft,juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour,flesh, skin, seed, pip, core, slice, peel, cut, squeeze, healthy diet, ingredients.	Joining, finishing, tools, fabrics template, pattern pieces, mark out, join, decorate	Slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards.	Join measure camouflage shelter stack cut hollow build Measure cut fasten gluing nailing screwing	Planning, investigating design, evaluate, make, user, purpose, ideas, product	Fruit and vegetable names, names of equipment/utensils sensory vocabulary e.g. soft,juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour,flesh, skin, seed, pip, core, slice, peel, cut, squeeze, healthy diet, ingredients.
Technical Knowledge to be taught Procedural knowledge (skills that will be developed to acquire this)	Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of a balanced diet. • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.	-Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card. -Select from a range of fabrics and materials according to their characteristics to create a chosen product. • Shape textiles using templates. • Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (eg. dyeing, sequins or printing).	Explore and use sliders and levers. Understand that different mechanisms produce different types of movement. • Cut materials safely using tools provided. • Measure and mark out. • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). • Create products using levers, wheels and winding mechanisms.	Bug hotels: Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card. Explore and use of different materials. Understand that materials can produce varied effects and finishes • Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.	Use a computer to develop designs Experiment with a range of colours for impact • Model designs using software.	Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of a balanced diet. • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.

We endeavour to make DT projects as purposeful as possible, giving the children a design brief or challenge to stimulate initial thinking.
Where possible, units follow a similar pattern of:
1) Design 2) Make 3) Evaluate

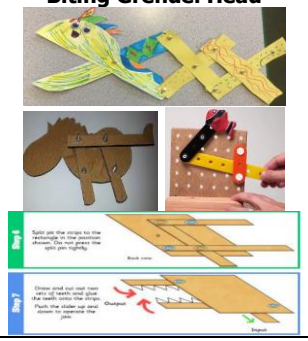
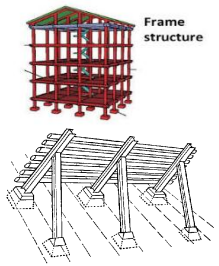
Design	Make	Evaluate
• Design with purpose	• Make products, refining the design Use software to design.	• Explain what is good about the finished design • Suggest something which could be improved.

Class 1 Yr B	A1	A2	Sp1	Sp2	Su1	Su2
Area	**Textiles**	**Mechanics**	**Mechanics**	**Structure**	**Computing**	**Food.**
Project	**Superhero capes**	**Moving page to show castle scene (levers and sliders)**	**STEM Solar System** **Build a solar system**	**Large 3D flower using recycled materials, accurate representations of plant structure** **Wild School Structures - Willow**	**Dinosaur world using software**	**Food from around the world / Preparing a fruit salad using fruit from different continents**
Vocabulary	Joining, finishing, tools, fabrics, template, pattern pieces, mark out, join, decorate	Slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards.	lever, pivot, card, masking tape, paper fastener, join turn	card, masking tape, paper fastener, join, glue,	Planning, investigating design, evaluate, make, user, purpose, product, program	Names of Fruit, vegetables, equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour,flesh, skin, seed, pip, core, slice, peel cut squeeze, healthy diet, ingredients.
Technical Knowledge to be taught **Procedural knowledge (skills that will be developed to acquire this)**	**Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card.** **Select from a range of fabrics and materials according to their characteristics to create a chosen product.** **• Shape textiles using templates.** **• Join textiles using running stitch.** **• Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).**	**Explore and use sliders andlevers.** **Understand that different mechanisms produce different types of movement.** **Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card.** **• Cut materials safely using tools provided.** **• Measure and mark out.** **• Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).** **• Create products using levers, wheels and winding mechanisms.**	**Explore and use of different materials.** **Understand that materials can produce varied effects and finishes.** **Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card.** **Understand that different mechanisms produce different types of movement.** **• Cut materials safely using tools provided.** **• Measure and mark out.** **• Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).** **• Demonstrate a range of joining techniques**	**Explore and use of different materials.** **Understand that materials can produce varied effects and finishes.** **Select and use simple utensils, tools and equipment to perform a job e.g. cut, marking out, cutting, joining and finishing; cut, shape and join paper and card.** **Know and use technical vocabulary relevant to the project.** **• Cut materials safely using tools provided.** **• Measure and mark out.** **• Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).** **• Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).** **• Use materials to practise drilling, screwing, gluing and nailing to make and strengthen products**	**Create a dinosaur world using computer software** **• Model designs using software.** **• Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage)**	**Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.** **Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of a balanced diet.** **• Cut, peel or grate ingredients safely and hygienically.** **• Measure or weigh using measuring cups or electronic scales.** **• Assemble or cook ingredients.**

We endeavour to make DT projects as purposeful as possible, giving the children a design brief or challenge to stimulate initial thinking. Where possible, units follow a similar pattern of: 1) Design 2) Make 3) Evaluate	Design	Make	Evaluate
	• Design with purpose • Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	• Make products, refining the design Use software to design.	• Explain what is good about the finished design • Suggest something which could be improved.

Links to EY curriculum			
	Expressive Arts and Design Make imaginative and complex 'small worlds' with blocks and construction kits, eg. a city with different buildings/a park. Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop own ideas and then decide which materials to use to express them.	**Physical Development** Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor. **Expressive Arts and Design** Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.	**Physical Development – Fine Motor** Use a range of small tools, including scissors, paintbrushes and cutlery. **Expressive Arts and Design – Creating with materials** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used
	All work in EYFS is underpinned by Communication and Language development • Learn new vocabulary • Articulate their ideas and thoughts in well-formed sentences. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.	- Make comments about what they have heard and ask questions to clarify their understanding. - Describe events in some detail. -Use new vocabulary in different contexts.	

Key Curriculum Drivers		
Diversity		• Know that everybody can be a designer
Global awareness		Recognise that some of the things that we use will have been designed and made around the world
Rural Aspirations		Know that everything man-made has been carefully designed/started with an idea
Inspired by Nature		We take every opportunity to be inspired by nature, whatever the subject.

Class 2 Yr A	A1	A2	Sp1	Sp2	Su1	Su2
Topic:	Anglo Saxons		Search for the Ring of Fire		Ancient Egypt	
Science	Nutrition		Rocks / Materials		Plants	
Area	**Mechanics – levers/linkages**	**Food**	**Structures-Frame structures** Link with Willow weaving / structures – Wild School	**computing**	**Textiles**	**Structures Free standing** Link with Willow weaving / structures – Wild School
Project	**Biting Grendel Head** 	**Anglo Saxon Cooking** 	**Avalanche Defences / Earthquake-proof Building** 	**Use LeoCAD to create and infill frame structures** 	**Egyptian Collars** 	**Strongest paper/card Throne for Pharaoh** 
Technical Knowledge to be taught **Procedural knowledge (skills that will be developed to acquire this)**	**1)Where are levers used?** **2)How do levers work?** **3)What is a fixed or loose pivot?** **4)What can we use to create a pivot when joining two pieces of card?** **5)How can we link more then one lever?** **• Use appropriate mechanisms for a product (such as axles, levers and linkages)**	**1)What might the Anglo Saxons have eaten at different times of the year?** **2)How could they maintain a healthy, balanced diet?** **3) How can we use Anglo Saxon ingredients to make a balanced meal?** **4) How can we prepare and cook some Anglo Saxon ingredients?** **5) How might the Anglo Saxons catch fish without**	**1)How are frame structures made stronger?** **2)Where are frame structures used?** **3) where are frame structures used?** **4)How can we safely cut wood?** **5)How can we reinforce the joins?** **6)Why don't avalanche barrier fall over?**	**1)What is CAD (Computer aided design)** **2)What are the benefits of CAD?** **3)How can we strengthen lego structures?** **4)What are the weak points of lego structures?**	**1)How are textiles used?** **2)How did the Ancient Egyptians use them?** **3)How can we join textiles? Which methods are strongest? How do they work?** **• Join textiles with appropriate stitching.** **4)How are textiles woven?** **5)How can we make paper beads and tassels? Where are these used?**	**1)What did Egyptian thrones look like?** **2)What can we do to card to make it stronger?** **3)What else can we do to make the chair design stronger? Where are the weak points?** **4)How can we fasten card together?** **5)What can make the card weaker?**

	• Choose suitable techniques to construct products or to repair items • Strengthen materials using suitable techniques. • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out accurately • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques.	a net? (challenge that can be tested in Forest School in the beck) 6) What edible ingredients can we find in Forest School? • Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). 7)How can we use kitchen utensils safely to prepare and combine food? 8)How do we keep food fresh? Why? Could Anglo Saxons keep food fresh? Why might this be dangerous?	7)How do scientists monitor possible avalanches? Where else are sensors used? (car, volcanos, oven temp, lampposts…) • Explore where sensors are used to monitor surroundings? •Suggest where these might also be used to prepare for natural events or man-made events Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques. • Cut materials accurately and safely by selecting appropriate tools • Measure/mark out accurately • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (eg. slots/cut outs) • Select appropriate joining techniques.	• model/evaluate designs using software designed for this purpose. • Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage)	• Select the most appropriate techniques to decorate textiles.	• Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques. • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out accurately • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques.
Vocabulary	Lever, linkage, pivot, fixed, loose, mechanism, system	Healthy, diet, texture, taste, appearance, poisonous, moist, fresh, savoury, hygienic, edible seasonal chop grate combine peel, tinned, frozen, salted	stable, brace, joint, frame	Computer Aided design /CAD reinforce support	Bonded, weave woven textile fastening function paper bead, tassel	Cylinder, fold, score, reinforce, brace, girder, secure

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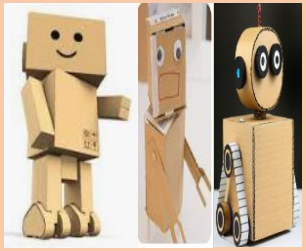
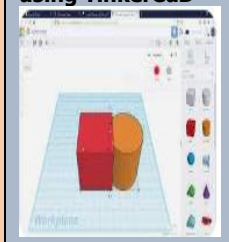
	•Design products that have a clear purpose and an intended user. • Use software to design and represent product designs. • Identify some of the great designers to generate design ideas • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Suggest possible materials to use • Refine work and techniques as work progresses, continually evaluating the product design.	• Evaluate finished products to see if they meet the design brief • Identify strengths and area to improve • Identify what they might do differently next time

Key Curriculum Drivers		
Diversity		Compare the backgrounds of some well-known designers
Global awareness		Consider where items in school / toys / clothes have been made
Rural Aspirations		Consider the skills needed to be an effective designer and where they might get their ideas/inspiration
Inspired by Nature		We take every opportunity to be inspired by nature, whatever the subject.

Class2 YrB	A1	A2	Sp1	Sp2	Su1	Su2
Topic:	Around the World in 80 days		Robots and Inventors		Stone Age	
Science	Light		Forces and magnets		Living Things and their habitats	
Area	Mechanics– axles	Structures: frame Link with Willow weaving / structures – Wild School	Mechanics-axles/ linkages/levers	Computing	Textiles	Food
Project	Build a Victorian Ferris wheel: 	Build tallest/strongest paper towers to replicate those around the world 	Build cardboard box robots with moving limbs. Add axles if time 	3d CAD models of robot using TinkerCaD 	Create a pouch for a stone age person to carry precious items 	Stone Age cooking 
Technical Knowledge to be taught Procedural knowledge (skills that will be developed to acquire this)	1)What are axles and where are they used? 2)What are the benefits and limitations of axles? 3) How could we make the wheel spin at a different angle? 4)What is lubrication? Why might this be important? (link with friction) 5)What was the Great Wheel? (*1895: the Great Wheel was built for the Empire of India Exhibition at Earls Court, London and was 94m tall. Construction began in Mar1894 and it opened to the public on 17/7/1895. It stayed in service until 1906 and was demolished in 1907, having carried over 2.5 million passengers)*	1)What are free standing structures? 2)What can make a tower more stable? 3)What can make a tower stronger? 4)Where else can you find shapes that strengthen structures? (triangles) 5) How can we strengthen paper? 6)What can weaken paper? • Choose suitable techniques to construct products or to repair items.	1)Where can you find linkages? 2)How can we join the different parts of our robot together but still allow movement? 3)What are fixed and loose pivots? 4)Where can you see levers used? 5)How can we add levers to our robot to make this movement easier? 6)How could we add axles so it can move? • Use appropriate mechanisms for a product (such as axles, levers and linkages)	1)How can we use CAD to create our robot designs? 2)What are the benefits of using CAD? • model/evaluate designs using software designed for this purpose.	1)What might be precious to a Stone Age person? 2)What types of textile containers can we find in the world around us? 3)How can we use a template to create a 3D product 4) How are textiles joined? How can we join ours? What different types of stitches are there? 5)How are textiles decorated? How can we decorate our pouches? 6) What type of fasteners can we find? Which are strongest? How do the work? Which can we use to join our pouch? • Understand the need for a seam allowance.	1)Where might Stone Age People have found their food? Understand that food has to be reared, grown or caught 2)What are carbohydrates? Where are they found? What are they used for? Where would Stone Age people get this? 3)What are protein? Where is it found? What is it used for? Where would Stone Age people find this? 4) How can we prepare ingredients in different ways? grating, slicing, chopping and cutting 5)What edible ingredients can we find in Forest School? 6)What might be the impact on Stone Age people of they didn't

	• Use appropriate mechanisms for a product (such as axles, levers and linkages) • Choose suitable techniques to construct products • Strengthen materials using suitable technique • Cut materials accurately/ safely by selecting appropriate tools • Measure and mark out accurately • Apply appropriate cutting and shaping techniques • Select appropriate joining techniques.	• Strengthen materials using suitable techniques • Cut materials accurately and safely by selecting appropriate tools • Measure and mark out to the nearest millimetre. • Apply appropriate cutting and shaping techniques • Select appropriate joining techniques.	• Choose suitable techniques to construct products or to repair items • Strengthen materials using suitable techniques. • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out accurately • Apply appropriate cutting and shaping techniques) • Select appropriate joining techniques.		• Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles. 7)Why do we need to tie a knot after sewing the final stitch? 8) How can a thimble protect my fingers when sewing?	get enough protein /carbohydrate? 7)How can we use kitchen utensils safely to prepare and combine food? 8) Which food are grown, reared or caught? • Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).
vocabulary	Ferris wheel Pods axle axle holder frame mechanism lubrication lubricant friction	Base Load Balance Cylinder Triangle storey girder brace tripod	Fixed / loose pivot (folded or split pin) Mechanism lever linkage system	CAD Computer Aided Design rotate visualise	Template thimble stitch sewing zip Velcro button seam allowance	appearance, fresh, savoury, hygienic, edible, grown, reared, caught, seasonal, harvested chop grate peel roast Carbohydrate Protein

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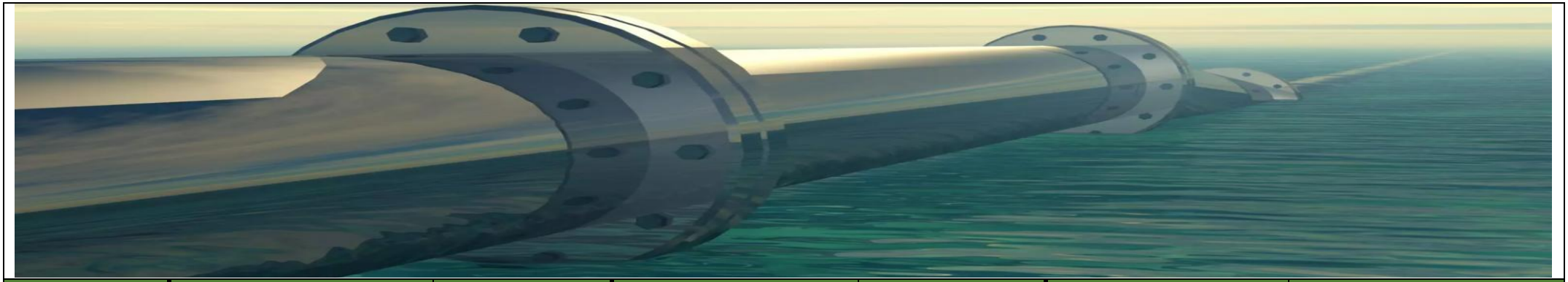
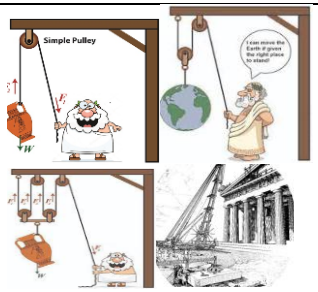
Design	Make	Evaluate
•Design products that have a clear purpose and an intended user. • Use software to design and represent product designs. • Identify some of the great designers to generate design ideas • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Suggest possible materials to use • Refine work and techniques as work progresses, continually evaluating the product design.	• Evaluate finished products to see if they meet the design brief • Identify strengths and area to improve • Identify what they might do differently next time

Key Curriculum Drivers		
Diversity		Compare the backgrounds of some well-known designers
Global awareness		Consider where items in school / toys / clothes have been made
Rural Aspirations		Consider the skills needed to be an effective designer and where they might get their ideas/inspiration
Inspired by Nature		We take every opportunity to be inspired by nature, whatever the subject.



Class 3 Yr A	A1	A2	Sp1	Sp2	Su1	Su2
Topic:	Vikings & Dragons		Lights, Camera, Action (Ancient Greece)		Keen to be Green	
Science	Electricity / States of matter		Light / forces		Living things / evolution	
Area	Structures (mechanisms) Link with Willow weaving / structures – Wild School		Mechanisms Computing: modelling and programming cogs and pulleys	Computing MIcrobits	textiles	Structures: Free standing / electrical circuits / shell structures
Project	Create the strongest bridge possible. (ext:Could you design a drawbridge / swing-bridge / include a trap door) - link with Viking battle at Stamford Bridge, York		Develop a pulley systems to help the Ancient Greeks build their temples	Tinker CAD and LeoCAD temple / Parthenon designs. Program Microbit: monitor temperature for workers	Reuse and recycle	Create stage scenery / props for Y6 productions
						
Technical Knowledge to be taught Procedural knowledge (skills that will be developed to acquire this)	1)What makes bridges rigid and stable? 2)What types of bridge are there? 3)How can we safely cut materials? 4)How can we reinforce the joins? 5)What can we do to materials to make them stronger? (card/wood) How can we make our bridge as strong as possible? 6) where can we see the strength of cylinders being used around us? 7) How can we join cylinders?		1)How did the Ancient Greeks lift the stones for their temples? 2)What difference does using one pulley make when you lift something? 3)How could we lift the stone easier with just one pulley? 3)What happens if we include more pulleys when we want to lift something?	1)How can we use CAD to recreate the parthenon? / a Greek temple? 2)What are the benefits of using CAD? 3)What is the best CAD program for this challenge? Why? • Use innovative combinations of electronics (or computing) and	1)What different types of textiles are there? 2)What jobs do they perform? (waterproof, heat retention, breathable, absorbent, strong, easily washed…) 3)How can we use a template to safely cut textiles and give them a new use? 4) How are textiles joined? How can we join ours?	1)How can we create free-standing structures? 2)How can we add electrical circuits to free standing structures? 3)How can we create shell structures with paper mache? • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). • Create circuits using electronics kits that employ a

	• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). (•Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears)) • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).	•Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	mechanics in product designs. • Develop more detailed, scale models using CAD software. Compare and contrast the effectiveness of programs used •Write code to control and monitor models or products.	What different types of stitches are there? 5)How are textiles decorated? How can we decorate our stockings? 6)Why do we sew our item inside out? 7) What type of fasteners can we find? Which are strongest? How do the work? Which can we use? • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).	number of components (such as LEDs, resistors, transistors and chips). • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).
Vocabulary	stable, brace, joint, frame span suspension (pivot) Deck Abutment Pile Pier Girder Types: beam, truss, arch, suspension, cantilever, cable-stay.	pulley wheels rope, cord, cable, chain, transmit energy and motion. rim sheaves types: fixed, movable, compound	CAD Computer Aided Design rotate visualise	Specification, tacking, working drawing, clasp, pinking shears, hem, reinforce, stem stitch, satin stitch, tie dye, cross stich	Free-standing base circuit switch parallel circuit series circuit brace laminate

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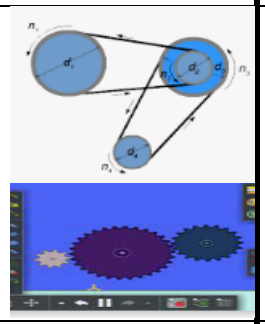
Where possible, units follow a similar pattern of:

1) Design 2) Make 3) Evaluate

Design	Make	Evaluate
• Design with the user in mind, motivated by the service a product will offer • Use prototypes, diagrams or computer aided designs to represent designs • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products.	• Make products through stages of prototypes, making continual refinements •Use and combine a range of materials and techniques, drawing upon personal experiences and research • Ensure products have a high quality finish, using art skills where appropriate.	• Evaluate own and others' designs to suggests where the design brief has been met or where further refinements are required • Evaluate the design of products so as to suggest improvements to the user experience.

Key Curriculum Drivers

Diversity		Discuss how your background / where you live in the world might limit your opportunities in design and technology.
Global awareness		Suggest why some areas are a hotspot for design (eg. Fashion in New York City, London, Milan, and Paris / cars in Germany / Silicon Valley in America
Rural Aspirations		-Discuss the benefits of computer aided design instead of traditional pen and paper methods. -Discuss the various people involved in developing and selling a product (researchers / designers / testers /marketing /selling
Inspired by Nature		We take every opportunity to be inspired by nature, whatever the subject.

Class 3 Yr B	A1	A2	Sp1	Sp2	Su1	Su2
Topic:	Space & Engineering		The Americas		World Cup/Olympics	
Science	Space / Forces		Sound / Electricity		Materials	
Area	Mechanisms – axles / levers	Computing: modelling and programming cogs and gears	Electrics MICROBITS	Structures: frame structures Link with Willow weaving / structures – Wild School	Food	Structures: Free standing / electrical circuits / shell structures Link with willow bowls –Wild school
Project	Build a Moon buggy with 4/6 wheels and a camera/probe that lifts/turns.	Machines (cogs and pulleys) – controlled by Computing.	Add lights /motor/ horn to moon buggy Program Microbit: display compass to explore	Native American teepees (also create in Forest School- waterproofing)	Celebration of food culture from chosen venue. Preparation of traditional meal and study into origins and nutritional value	Create stage scenery / props for Y6 productions
						
Technical Knowledge to be taught Procedural knowledge (skills that will be developed to acquire this)	1)What features would a moon buggy need? Why? 2)When can you see axles in your surroundings? Where can you find levers and pivots? 3)How does the positioning of the axles or wheel size affect the buggy's ability to go over bumps 4)Why might thinner wheels allow the Buggy to travel further? (link with friction) 5)How can we combine a pivot and levers to create the probe?	1) What is a cog/pulley? 2) Where can we find cogs in mechanisms around us? 3)How do cogs speed up or slow down a process? 4) How do gears make things turn quicker or slower? Which are easier or harder to turn? •Use scientific knowledge of the transference of forces to choose appropriate	1)How can we create a circuit with multiple lights? 2)How can we include a motor in the circuit? How can we use switches make the buggy move without lights? 3)How can we use motors and pulleys make the buggy move? How can we attach the motor, pulleys and belt? • Create circuits using electronics kits that employ a number of components (such as	1)What are free standing structures 2)Why is a conical or tripod structure stable? Where can we find examples around us? 3)Which textiles are waterproof? How are coats made waterproof? What about the joints? 4)How can we naturally waterproof textiles? 5)How can we fasten the different parts of our wooden frames?	1)What are the traditional foods of XXX? 2)What key nutrients will we get from these meals? 3)How can we prepare and cook a balanced meal using the same ingredients? 4)How can we safely use the kitchen utensils? 5)How can we safely prepare the ingredients? (grating, chopping, slicing) 6)How can we store the ingredients to preserve them? Why do some foods last longer them others?	1)How can we create free-standing structures? 2)How can we add electrical circuits to free standing structures? 3)How can we create shell structures with paper mache? • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips). • Cut materials with precision and refine the finish with appropriate tools (such as

	6)What is lubrication? Why might this be important? (link with friction) • Develop a range of practical skills to create products (eg. cut, drill, nail, screw, glue, filing and sand •Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (eg levers, winding mechanisms, pulleys and gears). • Cut materials with precision and refine the finish with appropriate tools (eg. sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape) • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape • Use innovative combinations of electronics and mechanics in designs	mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	LEDs, resistors, transistors and chips). •Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears). • Use innovative combinations of electronics and mechanics in product designs. • Convert rotary motion to linear~~-using cams.~~	**6)How can we waterproof our structures?** • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).	**7)Why do foods have *Best Before* or *Use by* dates?** **8)How can we present our meal so it is appealing?** • Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.	sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).
vocabulary	Axle lubrication axle holder friction lubrication lubricant	gear, driver, follower, rotation, motor, belt, spindle, motor, circuit, switch, ratio, transmit	light emitting diode, reed switch, tilt switch Light dependent resistor Pulley, gear, driver, follower, rotation, motor, belt, spindle, motor, circuit, switch, ratio, transmit,	Tripod, conical, frame, waterproof, square lashing, pole lashing	Utensils heat sources preservation Use By Best Before nutritional deficiency	Free-standing base circuit switch parallel circuit series circuit brace laminate

We endeavour to make DT projects as purposeful as possible, giving the children a design brief or challenge to stimulate initial thinking. Where possible, units follow a similar pattern of: **1) Design 2) Make 3) Evaluate**	**Design**	**Make**	**Evaluate**
	• Design with the user in mind, motivated by the service a product will offer • Use prototypes, diagrams or computer aided designs to represent designs • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products.	• Make products through stages of prototypes, making continual refinements •Use and combine a range of materials and techniques, drawing upon personal experiences and research • Ensure products have a high quality finish, using art skills where appropriate.	• Evaluate own and others' designs to suggests where the design brief has been met or where further refinements are required • Evaluate the design of products so as to suggest improvements to the user experience.

Key Curriculum Drivers

Diversity		Discuss how your background / where you live in the world might limit your opportunities in design and technology.
Global awareness		Suggest why some areas are a hotspot for design (eg. Fashion in New York City, London, Milan, and Paris / cars in Germany / Silicon Valley in America
Rural Aspirations		-Discuss the benefits of computer aided design instead of traditional pen and paper methods. -Discuss the people involved in developing and selling a product (researchers/designers/testers/marketing /selling
Inspired by Nature		We take every opportunity to be inspired by nature, whatever the subject.

Class 3 Yr C	A1	A2	Sp1	Sp2	Su1	Sp1
Topic:	Edge of an Empire (Romans)		War: What is it Good For?		Brompton & Beyond	
Science	Changes / circulatory system		Life cycles / plants		Digestion / forces	
Area	Structures Link with Willow weaving / structures – Wild School; mechanisms	Textiles	Stuctures: Shell Structures	Food	Structures	Revision: Structures: Free standing / electrical circuits / shells
Project	Build own Trebuchets / catapults – who can fire with accuracy to destroy the wall? Who can fire furthest? 	Christmas Stockings 	Shelter building – in style of WWII (also in Forest Schools) / Mache helmet 	Rationing Recipes – creating recipes as part of a balanced diet with limited resources - Bread 	Build a Cayley Glider 	Create stage scenery / props for Y6 productions 
Technical Knowledge to be taught Procedural knowledge (skills that will be developed to acquire this)	1)When were trebuchets used? Why did people stop using them? 2)How was the force created to throw the 'bombs'? 3)Where are the levers and pivots on a trebuchet? 4)Why does a longer 'arm' often throw the bomb further? (think about dog ball throwers/ levers!) 4)How can you store the power using elastic instead of a weight?	1)How can we use a template to create a 3D product 2) How are textiles joined? How can we join ours? What different types of stitches are there? 3)How are textiles decorated? How can we decorate our stockings? 4)Why do we sew our stocking inside out?	1) What is a shell structure? 2)Where are shell structures used around us? 3)What gives shell structures their strength? How can we make the thin outer layer stronger? (laminating) How does paper mache become stronger? 4)Why Were Anderson shelters that shape? What was the point of covering them with soil?	1)What key nutrients did the people get from weekly rations? Was it enough? 2)How would the seasons have affected what else they could have eaten with their rations? 3)How can we prepare and cook a balanced meal using the same ingredients? 4)How can we safely use the kitchen utensils?	1)What is the difference between a glider and an aeroplane? 2)What does a glider need to fly? 3)How did Cayley manage to take flight in Brompton? 4)How can we cut the material safely and accurately? 5)How can we join the material to keep the glider as light as possible?	1)How can we create free-standing structures? 2)How can we add electrical circuits to free standing structures? 3)How can we create shell structures with paper mache? • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).

	5)What features of structures can we use to make the base stable and rigid? How can we reinforce the joins? **6)How can we store more energy to increase the distance that the object flies?** **7)Do different objects fly different distances? Why?** • Develop a range of practical skills to create products (eg cutting, drilling, screwing, filing, nailing, gluing, sanding). •Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, , pulleys and gears). • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of material qualities to choose appropriate tools to cut and shape	**5) What type of fasteners can we find? Which are strongest? How do the work? Which can we use to keep our stocking closed?** • Create objects that employ a seam allowance. • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).	**5)How can we prove that this shape of shelter is best at deflecting forces?** **6)Why were Anderson shelters made out of corrugated metal? Where do we see corrugated materials used? Why?** **7) How can we join the edges of cardboard? How can we include an opening/closing door in our shelter?** • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape	**5)How can we safely prepare the ingredients? (grating, chopping, slicing)** **6)How can we adapt bread recipes to change the taste and texture?** • Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.	**6)How can we cut a slot in the material safely and accurately?** **7)What can we change on our gliders to improve the length of flight?** • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). • Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape	• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).
vocabulary	Lever pivot payload counterweight energy siege beam	Specification, tacking, working drawing, clasp, pinking shears, hem, reinforce, stem stitch, satin stitch, tie dye, cross stich	Laminated laminate shell structure transmit corrugated deflect impact force	yeast, dough, cheese wholemeal, unleavened, baking soda, spice, herbs, carbohydrate, sugar, fat, protein, vitamins, nutrients, gluten,	fixed-wing cockpit Aileron Flaps Propeller Rudder Wings Elevators Engine thermals thrust, lift, drag, and weight	Free-standing base circuit switch parallel circuit series circuit brace laminate

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Enrichment in DT at Brompton and Sawdon Community Primary School:

- Cayley Link: gliders / flight / village links to design and fulfilment
- STEM projects (eg. Formula 1 car designs in collaboration with UTC)
- Engineering Week visit (Scarborough Spa- local businesses showcase latest innovations)
- Individual and group competitions (local and regional)
- Weekly 'Aspirations' assemblies, celebrating global innovation and design
- Engineering club (+Enterprise Club)
- Lego club
- Visits to Yorkshire Air Museum
- Visit to Leeds City Museum
- Community projects (eg. Community quilt / mural)
- Local industry links: (eg. ABG International visits / assemblies)
- Cayley's Cuttings: Garden design and structures

"DESIGN IS NOT JUST WHAT IT LOOKS LIKE AND FEELS LIKE. DESIGN IS HOW IT WORKS" -STEVE JOBS