Brompton and Sawdon CP Whole School Design & Technology Curriculum

Rationale

- It is our duty at Brompton & Sawdon CP, as a mainstream school, to provide a curriculum that is **ambitious** and **challenging** for **all** learners (where practical).
- This curriculum must fulfil the requirements set out in the **National Curriculum**. However, at Brompton, we go **beyond** these expectations, delivering a **deep**, as well as a **broad and balanced**, curriculum, which also reflect the needs, **rural context** and interests of our pupils.
- Whilst it is important that students have the opportunity to experience this depth of learning and experience their year group's curriculum and expectations, this should not be at the expense of **mastery** and **long-term retention**.
- When a student has not mastered a year group's curriculum, it is important that leaders and teachers **adapt** their curriculum, resources and practice. This may require teachers to 'secure' previous year group's expectations.
- At Brompton & Sawdon CP we firmly believe that **mixed-aged classes** are a benefit and not a necessity or hindrance; they allow students to progress at their own rate, whether that is allowing students to build on their strengths and looking at the next years' curricula or allowing students the time and support to secure understanding of previous year groups' curricula.
- We recognise, at Brompton, that students' **starting points** and previous educational experiences vary significantly. Our curriculum allows all students, especially the **disadvantaged**, to achieve their potential.

The following whole-school Design and Technology curriculum reflects the above rationale. It also sets out how Brompton & Sawdon CP plan for and deliver (and go beyond) the National Curriculum. This is a 'working document'; teachers and leaders adapt the following based on the *'impact'* on students.

This plan outlines what is taught (Intent), as well as when, where, why, how it is taught (Implementation). It breaks down the school's Art and Design curriculum into each dimension of the subject and then by year group. This allows teachers to clearly see the progression and sequence that skills need to be taught, so they can adapt their practice (if required).

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KS1 Design and Technology

Intent - What is taught? (Objectives) Beyond?	Milestones (Skill Progression)	Implementation – When, How, Where and Why?
Year 1 and 2 Students will: Design • 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	**Key Stage One** Design • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Use software to design. Explore objects and designs to identify likes and dislikes of the designs. • Explore how products have been created.	Class 1 – Year 1 Design and Technology is woven throughout our topic work in Class 1, particularly using a STEM approach. The following lessons are an example of how we teach Design and Technology through topic work - a similar sequence of lessons is also followed for other topic activities such as 'Moving body parts' and 'Solar Systems'. Design **A flying machine -** Sharing experiences and knowledge of a range of real-life flying machines including helicopters, hot-air balloons, aeroplanes and gliders. Children are given time to explore materials and tools available within a science lessons, grouping and categorising materials to help them choose the materials that will suit their design. Drawing a design to share with their

		peers, explaining the tools they intend to use and their justification for this e.g. “I am using staples to attach the wings because I think this will be stronger than a glue stick”. **My Superhero Cape -** Children are given a template for their superhero cape to adapt and modify for their superhero needs. Examples of these may be waterproof for use in rain/water, reflective for use at night, warm for use in colder regions etc. We pose questions to the children such as ‘what material will your cape be and why’? Children will explore materials and be offered time to discuss their properties and perform quick tests in relation to their design. E.g. ‘This material doesn’t soak up the water so it would be good for my waterproof design’, ‘this plastic is too hard for my cape’. Children draw their design and label it with their design ideas/annotations. **Forest School Mini Shelters** - During our forest sessions we learn about British wildlife and the animals that are native to our local

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Make • 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	Make • Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. Model designs using software. • Shape textiles using templates.	area. Children learn about how these animals build their homes and work in small groups to create a design through the form of discussion, modelling and mock-ups. The design is evolving and children will continue to develop this over a series of lessons with their team. Make **A flying machine -** Children are given time to independently make, develop and finish their designs. This includes cutting, joining, shaping a range of materials. We also give children access to adult supported tools including junior hacksaws to use with thicker materials such as rigid cardboard tubes. **My Superhero Cape -** Children use their mathematical knowledge to measure out their materials. Cutting, shaping and joining their materials to achieve their desired finish. **Forest School Mini Shelters -** Children are given plenty of time to explore the natural materials in the forest. Foraging and

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Evaluate • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria	Evaluate • Suggest improvements to existing designs. • Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).	scavenging for the materials they need to build their mini-shelter. In some cases, the children require items that cannot be found in the forest such as string or rope; the children can access these from the forest school bag. The children use a range of tools in the forest including hacksaws, peelers and bowsaws (with adult supervision). Children must complete a 'Tool talk' before using these to ensure that they are able to use these tools safely and correctly. Evaluate **A flying machine -** Children are given time to stop and explore the designs of their peers. Provide feedback and ideas to one another, as well as replicating ideas from other designs in the group. Children then test their flying machine and measure the distance it can fly. This is measured during a maths lesson. **My Superhero Cape -** Towards the end of a 'making' lesson, children will be asked to stop and think about how their design build

		is going. 'Does it look like their design?' 'Is there something that is not quite joining together how you would like?' We give children time to look at their peers designs and offer feedback or magpie ideas that can support the design development. Our designs are built across a short sequence of lessons to allow the children to stop, go away and think about their design, then come back and continue with a fresh set of eyes. **Forest School Mini Shelters -** On returning each week to their developing design, the group can see what has happened to their materials throughout the week and use this to support their on-going evaluation. We pose questions to the children such as 'has your shelter withstood the wind and rain?' 'Why do you think your shelter is wet on the inside?' 'What material could you use to cover your shelter to make it camouflage?' Our designs can then be compared to shelters that animals build themselves. 'What is similar/different about your shelters?'.

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Technical Knowledge • 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.	Technical Knowledge • Demonstrate a range of joining techniques (such as tearing, cutting, folding and curling). • Create products using levers, wheels and • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). • Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products. • Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).	Technical knowledge **Bridges** - STEM activity. Children are given a home learning challenge to design a bridge at home using one of our bridge designs (suspended, truss and arch). They use a range of designs including straws, wooden dowels, cardboard, spaghetti pasta and marshmallows. We test the strength of the bridge with a small weight - keeping this the same for every bridge we test. The children also provide verbal feedback to their peers on their designs.

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Cooking and Nutrition • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from.	Cooking and Nutrition • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.	Cooking and Nutrition **Pumpkin Soup** - During harvest festival we explore a range of harvested foods. We enjoy the story Pumpkin Soup and use this in our role play area to represent cooking. We then make pumpkin soup for our whole class to enjoy as a warm treat in the forest during Forest Schools. **Seasonal food** - The children take part in cooking and baking for a range of celebrated occasions including gingerbread biscuits at Christmas and Chinese food for Chinese New Year. **Edible Art** - During our Chocolate topic we learn about where the cocoa bean comes from and its journey to a chocolate bar. We taste test chocolate of differing cocoas and then use these to create our own chocolate bar. We melt different chocolates and mix them together into shapes or patterns.

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Year 3 Students will:	**Lower Key Stage 2:**	Class 2 - Year 2 & 3 (Key projects listed, with reference to 'Design, Make, Evaluate and Technical Knowledge')
Design • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	Design • Design with purpose by identifying opportunities to design. • Use software to design and represent product designs. • Disassemble products to understand how they work.	Design **Tudor buildings at the time of Great Fire of London** Students investigate the design and structure of buildings from the Tudor period that were destroyed during the reign of the Stuarts in the fire of 1666 and compare and contrast with the design of modern structures. Students then design a 3D model of a Tudor building. Students plan, design and share their ideas, make sketches and templates from information gathered through their research. **Anglo Saxon Shields and Spears** Students research the design, structure and purpose of shields and spears made in Anglo Saxon times. Students discuss, design and plan making from different materials (**shields –** clay, **spear** - paper and cardboard).

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		Parachutes Students are taught the aerodynamics of parachutes and research different applicable materials and designs. They then plan their structure, including materials, design, creating templates and discussing with the teacher or their talk partner. **Kite / Wind Streamer** Students investigate the use of kites and wind streamers as part of their geography lessons, investigating weather and wind patterns within the UK. They then design their own, looking at the most appropriate material for the kite and looking at how to use a paper plate and tissue paper to help in the design of a wind streamer. Students then design templates and discuss the design within the classroom. **Structure to withstand degrees of wind** Students work in small groups to design a structure from a set of pre-determined items (blocks, paper and cardboard, spaghetti and marshmallows, etc.). They work in teams to

		design a structure that is to withstand different degrees of wind pressure (using an electronic fan). Using teamwork, they work out the most secure structure, making drawing and templates for the design, whilst discussing their ideas with their peers. (Links with Geography – weather, and Science – using everyday materials) **Pyramids** Students investigate the methods and materials used to build pyramids in Ancient Egypt and plan and design their own with peer to peer support, planning via sketches and diagrams and using computer technology. **Volcanoes** Students investigate and design their own volcano, identifying what appropriate materials and tools are needed to be used for a practical experiment for the volcano to erupt. They look for the necessary materials to withstand the products used in creating the eruption.

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Make • 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	Make • Make products by working efficiently (such as by carefully selecting materials). • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • 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. • Understand the need for a seam allowance. • Join textiles with appropriate stitching.	**Forest Schools** Students design a variety of Design and Technology projects through their Forest School activities. Make **Tudor buildings at the time of Great Fire of London** Students use information gathered to make 3D model of Tudor building from the materials used at the time and (where possible) with the tools used. **Anglo Saxon Shields and Spears** Students use clay and shaping tools to follow their designs, providing drying time in order to decorate. Students use a combination of cardboard and card, using a variety of colouring materials to personalise their spear heads, including paint, chalk, felt tip pens, crayons and glitter. **Parachutes**

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	• Select the most appropriate techniques to decorate textiles.	Students use a selection of materials (cloth, paper, card, plastic, string, cotton, etc.) to construct their parachute, using cutting and measuring techniques and fixing the constituent parts together using glue, tape or staples. Students will also use a variety of colouring materials to enhance the design with colour. **Kite / Wind Streamer** Students learn to shape and cut the relative materials to the correct size using measuring (linking to Mathematics) and the relevant cutting tools. They then put their structure together using the correct connecting material (glue, tape, staples etc.), whilst enhancing the design with a variety of colouring materials (paint, felt pens, crayons, etc.). **Structure to withstand degrees of wind** Students construct their towers using the materials they have been allocated, attempting to withstand the strongest wind force.

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		Pyramids Students construct their pyramids using the design and technics used in Ancient Egypt. Where possible children try to use similar materials and tools or appropriate substitutes. **Volcanoes** Students follow their design, moulding and creating their structure, using the tools and materials they assessed would be most appropriate. **Forest Schools** Students follow instructions to make bug hotels, dens, dream catchers, wind streamers and fire stacks using items they find in the forest. They also supplement certain maths lessons, by designing forest clocks, composing mathematical sentences and exhibiting and building 2D and 3D shapes.

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Evaluate • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	Evaluate • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs. • Improve upon existing designs, giving reasons for choices.	Evaluate **Tudor buildings at the time of Great Fire of London** Students evaluate the success of the structure and compare with modern structures. Evaluating why materials and methods changed at this time. **Anglo Saxon Shields and Spears** Students evaluate the aesthetic quality of their shields, receiving teacher and peer feedback and change accordingly. Students measure the aesthetic and practical qualities of their spears and respond to feedback to ensure greater rigidity and visual quality. **Parachutes** Students evaluate their work by the practical success of the parachute – does it float gently to the ground with an appropriate object attached. Students also evaluate the rigour of the parachute by testing increasing weighted objects to assess how much the parachute can hold. Students then investigate other parachutes and analyse the

		differences and what they could do differently based on these criteria. **Kite / Wind Streamer** Students evaluate the success of their products either in the school grounds or as part of Forest Schools. Students then make notes on what went well and what could be improved and shared with the class while taking on feedback. **Structure to withstand degrees of wind** Students experiment with their structures attempting to withstand different levels of wind. They then evaluate their structure to assess if it could be made more secure and adjust accordingly. **Pyramids** Students evaluate the solidity of their structure, test its practical application and evaluate how they could improve and make the structure solid and able to withstand the outdoor elements that the existing pyramids do.

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Technical Knowledge • 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]	Technical Knowledge • Create series and parallel circuits • Control and monitor models using software designed for this purpose. • Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques	**Volcanoes** Students conduct the experiment to make the volcano explode and evaluate the success of the structure and what could have been done to improve it. **Forest Schools** Students evaluate the practical application of their designs, checking to see that they work for the purpose they are designed and obtaining adult and peer feedback. Students then amend and develop their structures based on this feedback. Technical Knowledge **Tudor buildings at the time of Great Fire of London** Students research to see what would work better to make their building more secure and experiment with different materials that are available now that were not used in Tudor times. **Anglo Saxon Shields and Spears**

• apply their understanding of computing to program, monitor and control their products.	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	Students investigate what materials were used to make shields and spears in Anglo Saxon times and the different impact this would have on their effectiveness in battle. **Parachutes / Kite / Wind Streamer** Students assess the effectiveness of the materials used and whether there are alternatives that could produce stronger, better parachutes / kites / wind streamers. **Structure to withstand degrees of wind** Students evaluate and assess what different formations can be used to stabilise their structures and if there are any alternative mechanisms they could use as part of the structure. **Pyramids** Students assess the success of their structure and make relevant changes to strengthen. **Volcanoes** Students research other materials used to build volcanoes and assess against their own structure, looking at which was the most effective. **Forest Schools**

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<u>Cooking and Nutrition</u> • 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.	<u>Cooking and Nutrition</u> • 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).	Students initially investigate the best materials for their structures, assess the availability and use of substitutes if their preferred option is not available and then assess when back in school what worked, what didn't and what alternative options could they have taken. <u>Cooking and Nutrition</u> Students are taught about the basic principles of a balanced healthy diet, breaking it down to the 5 main food groups. They then need to produce what constitutes a healthy meal. Students are taught how to put a balanced meal together and work in groups within the classroom to source, prepare, cook and digest the meal they have produced. Students follow recipes to cook pancakes, healthy burgers, biscuits and Stone Age Stewed Fruit. Students are taught about the location of where certain food products come from as part of the 'Around the World' topic and are encouraged to investigate their own food stocks and where they originate from.

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<u>Year 1 and 2 Students will:</u> <u>Design</u> • 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 <u>Make</u> • 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		Students also research and investigate seasonality, to identify context and environment for certain foods to grow.

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construction materials, textiles and ingredients, according to their characteristics <u>Evaluate</u> • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria <u>Technical Knowledge</u> • 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. <u>Cooking and Nutrition</u> • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from. **<u>Year 3 Students will:</u>**		

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Design • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design Make • 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 Evaluate		

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• investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world <u>Technical Knowledge</u> • 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. <u>Cooking and Nutrition</u>		

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• 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.		
IMPACT:		**FUTURE FOCI (to inform action plan or SIP):**

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KS2 Design and Technology

Intent - What is taught? (Objectives) Beyond?	Milestones (Skill Progression)	Implementation – When, How, Where and Why?
Year 4, 5 and 6 Students will: Design • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	Upper Key Stage 2 Design • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Ensure products have a high-quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.	Class 3 - Year 4, 5 & 6 (Key projects listed, with reference to 'Design, Make, Evaluate and Technical Knowledge') Design **Greek Theatre Mask Project** – generation of designs based on historical images and replicas to meet the purpose of a functional mask which presents a particular emotion by manipulating the materials and construction techniques. **TechCard project** – Modelled design criteria given by the project. This is used to evaluate the product and a basis for children's own criteria. **Viking shield and purse** – Use of simple materials (which may have been present in Viking era) to make products that had practical use at the time.

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		Prop and costume – This class produces a summer performance which requires various prop and costume design. This forms a mini-project related to this task. E.g. the creation of a function 'dinosaur egg' which contains a working puppet appearing in the show. Children decide materials and build technique depending on the purpose and functionality and longevity of the prop. **Space Rocket** – Science (STEM) project, linking to learning about space and forces. Students design own bottle rocket using aerodynamic principles. **Parachute** - Science (STEM) project, students design, choosing materials, their own parachute using aerodynamic principles and criteria. **Mini-Brompton** – Students research design techniques for buildings by observing other similar style buildings. This is part of a local heritage project with Woodend Museum. Students design replica of a notable building in Brompton. **Ear Defenders** - Science (STEM) – Students design functional ear defenders for loud

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		environments, using recycled materials. They show this through exploded diagrams. **Forest Schools – e.g. bow and arrow, story sticks, decoration, den building** – Students design multiple DT projects through their Forest School activities **Dunkirk ship and harbour –** Using exploded diagrams, students design a floating 'Dunkirk' ship. This is also used in a Lego stop-gap motion recreation of the harbour and evacuation.
Make • 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	Make • Make products through stages of prototypes, making continual refinements. • •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	Make **Greek Theatre Mask Project** – students use and manipulate a wider range of materials (e.g. gummed paper) to make a function and aesthetically pleasing mask. **TechCard project** – Use a range of materials to create a functioning TechCard project (e.g. fairground ride or balloon powered car). This also requires cutting accurately though sawing or 'finishing' wooden elements of designs to achieve a purpose (e.g. sharpening of dowel rods to allow motion)

	shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). • Create objects (such as a cushion) 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 (such as a soft decoration for comfort on a cushion).	**Viking shield and purse** – Use of textiles (cutting and sewing) to create a functional purse. Combining multiple recycled materials to create a replica Viking shield. **Prop and costume –** This class produces a summer performance which requires various prop and costume design. This forms a mini-project related to this task. E.g. the creation of a function 'dinosaur egg' which contains a working puppet appearing in the show. Children decide materials and build technique depending on the purpose and functionality and longevity of the prop. **Space Rocket** – Use of accurate 'joining' to add aerodynamic elements to space 'rocket' designs. **Parachute** – Use of accurate 'joining' to add aerodynamic elements to space 'rocket' designs. **Mini-Brompton** – Use a combination of materials, depending on their flexibility to achieve desired model design. **Ear Defenders** – Reinforces 'joining' techniques, to allow product to be functional and durable.

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		Forest Schools – bow and arrow, story sticks, decoration, den building - Forest School 'Tool Talk' implemented from earlier in the school. Students can use a range of cutting and shaping devices, including safety knives, to create functional products created from materials found in the forest, e.g. Bow and Arrow require: stripping of bark; shaping of arrowhead; cutting of 'notches' to attach string and support arrow. **Dunkirk ship and harbour** – Accurate cutting of wood and cork, to create floating Dunkirk ship, which can also be propelled well in wind. **Paint Printing Tool** – Students use accurate and safe sawing techniques, to create functional printing tool (for later art project). They also use sanding to allow for greater functionality. **Viking Weaving Looms** – Students use accurate and safe sawing techniques, to create functional printing tool (for later art project). They also use sanding to allow for greater functionality.

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<u>Evaluate</u> • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	<u>Evaluate</u> • Evaluate the design of products so as to suggest improvements to the user experience. • Create innovative designs that improve upon existing products. • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.	<u>Evaluate</u> **Greek Theatre Mask Project** – using criteria, students test their products to see that they are functional, comfortable and aesthetically pleasing. They complete this alongside the recognition of the Ancient Greeks' impact on the World in terms of entertainment and performance and their creation of theatre masks of this type over 2000 years ago. **TechCard project** – Each 'project' and functioning model is reviewed against the design criteria. It is also analysed from a technical and scientific point of view, to ensure future 'builds' are improved. **Viking shield and purse** – Students 'test' their creation for the functional use. **Prop and costume** – Dress rehearsals are used to evaluate the effectiveness of designs and builds. Revisions are made as a result of this, e.g. strengthening of regularly used props or increasing efficiency of animated props. **Space Rocket** – Evaluation of design against scientific principles, to help improve aerodynamic principles.

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		Parachute – Evaluation of design against scientific principles, to help improve aerodynamic principles. **Mini-Brompton** – Arts Award evaluation – against design criteria at the beginning of the project. **Ear Defenders** – Evaluation of design and material properties for the functional use of protecting ears from loud noises, comparing to other commercial designs and those of other students. **Forest Schools – story sticks, decoration, den building, bow and arrow** – *ad hoc.* evaluations of designs, e.g. 'wind testing' of den builds; testing of bow and arrow at a target. **Dunkirk ship and harbour** – Testing and evaluation of functional use – buoyancy and using air resistance principles to propel 'boat' along a channel. **Sportswear** – Evaluation of drying principles of sportswear, based on the material properties of the designs (commercially developed).

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Technical Knowledge • 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.	Technical Knowledge • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips). • Write code to control and monitor models or products. • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). • Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.	Technical Knowledge **Greek Theatre Mask Project** – strengthen and stiffen the complex structure of the mask, to create facial expression and a usable product. This is achieved through manipulating gummed paper and creating other structures to support the complex facial features. **TechCard project** – Apply knowledge of gears, pulleys, cams, levers and linkages to build functioning models and products (e.g. balloon powered car, 'fairground rides', TechCard cranes, etc.) **Viking shield and purse** – Select and use materials based on their ability to create a functioning and strengthened/durable design. Use sewing stitches to also achieve purpose. **Prop and costume -** Select and use materials based on their ability to create a functioning and strengthened/durable design. **Space Rocket** – Use a balance of reinforcement and aerodynamic principles (including mass), to create a functioning bottle rocket.

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		Parachute – Use a balance of reinforcement and aerodynamic principles (including mass), to create a functioning parachute. **Ear Defenders** – Select recycled materials to produce reinforced structures, but also understand the limitations of recycled materials. **Forest Schools – story sticks, decoration, den building** – Students learn about knot tying and the significant principles which allow certain wood from certain trees to be effective building materials (e.g. cross-lashing over bamboo to make effective shelters that can be manipulated easily into different shapes, to suit purpose/space) **MicroBits –** Students program, as part of their Computing curriculum, MircoBits – physical devices, which perform a multitude of functions. They use software and programming language to control and monitor their products, as well as use them for practical purposes (e.g. playing games, testing reactions, assessing conductivity). **Electronic Buzzer Game** – Students, in Science, use their knowledge of materials and their

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		properties to create a functioning 'electronic buzzer game', similar to *Operation*. They combine electric components into circuits to allow this game to work, designing it through exploded diagrams.
<u>Cooking and Nutrition</u> • 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.	<u>Cooking and Nutrition</u> • Understand the importance of correct storage and handling of ingredients (using knowledge of microorganisms). • 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.	<u>Cooking and Nutrition</u> **Viking bread -** Students understand, from a historical point of view, why certain ingredients are available due to their ability to grow or be processed under the correct conditions. Students combine ingredients, scaling recipes if necessary, to bake their simple Viking bread. **Making own butter** – Students 'process' butter by separating cream, through 'churning'. This is done as part of science investigation into reversible and irreversible changes. **An athlete's diet** – Students prepare a range of healthy food from all food groups for an athlete, as part of a Sports/Olympics topic. Students also combine ingredients to make their own energy bar for a Tour De Yorkshire

		cyclist. Students understand the benefits of the ingredients through this process. **Growing own vegetables (soup)** – Using the school garden and greenhouse – students grow own vegetable to then combine into a soup as part of a sustainable living unit of work. **Rationing** – As part of 'War' topic, students understand how basic ingredients were made available through 'Dig for Victory' unit. Students understand how nutritionally valuable this diet would have been during World War II.
Year 6 students at Greater Depth will *(key stage 3):* • To be determined, once above is very secure.		
IMPACT:		**FUTURE FOCI (to inform action plan or SIP):**

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Overview of DT skills progression at Brompton and Sawdon Primary school

- **Ambitious milestones designed to stretch learning and understanding**

Teachers able differentiate down to previous milestone, or up to the next, as required

Threshold Concept	Area	Class 1 Skills Milestones	Class 2 Skills Milestones	Class 3 Skills Milestones
Master practical skills This concept involves developing the skills needed to make high quality products (we have highlighted a range of skills but they may be added to or changed	Food	• Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.	• 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).	• 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.
	Materials	• Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. • 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	• Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • 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.	• 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).

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		combining materials to strengthen).		
	Textiles	• 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).	• Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles.	• Create objects (such as a cushion) 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 (such as a soft decoration for comfort on a cushion).
	Electricals and electronics	• Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).	• Create series and parallel circuits	• Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).
	Computing	• Model designs using software.	• Control and monitor models using software designed for this purpose.	• Write code to control and monitor models or products.
	Construction	• Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.	• Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques.	• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).
	Mechanics	• Create products using levers, wheels and winding mechanisms.	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers,	• Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.

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			winding mechanisms, pulleys and gears).	
Design, make, evaluate and improve This concept involves developing the process of design thinking and seeing design as a process.		• Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Use software to design.	• Design with purpose by identifying opportunities to design. • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs.	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.
Take inspiration from design throughout history This concept involves appreciating the design process that has influenced the products we use in everyday life.		• Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	• Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience.